

Hints to students on the use of the eyes / by Edward Reynolds.

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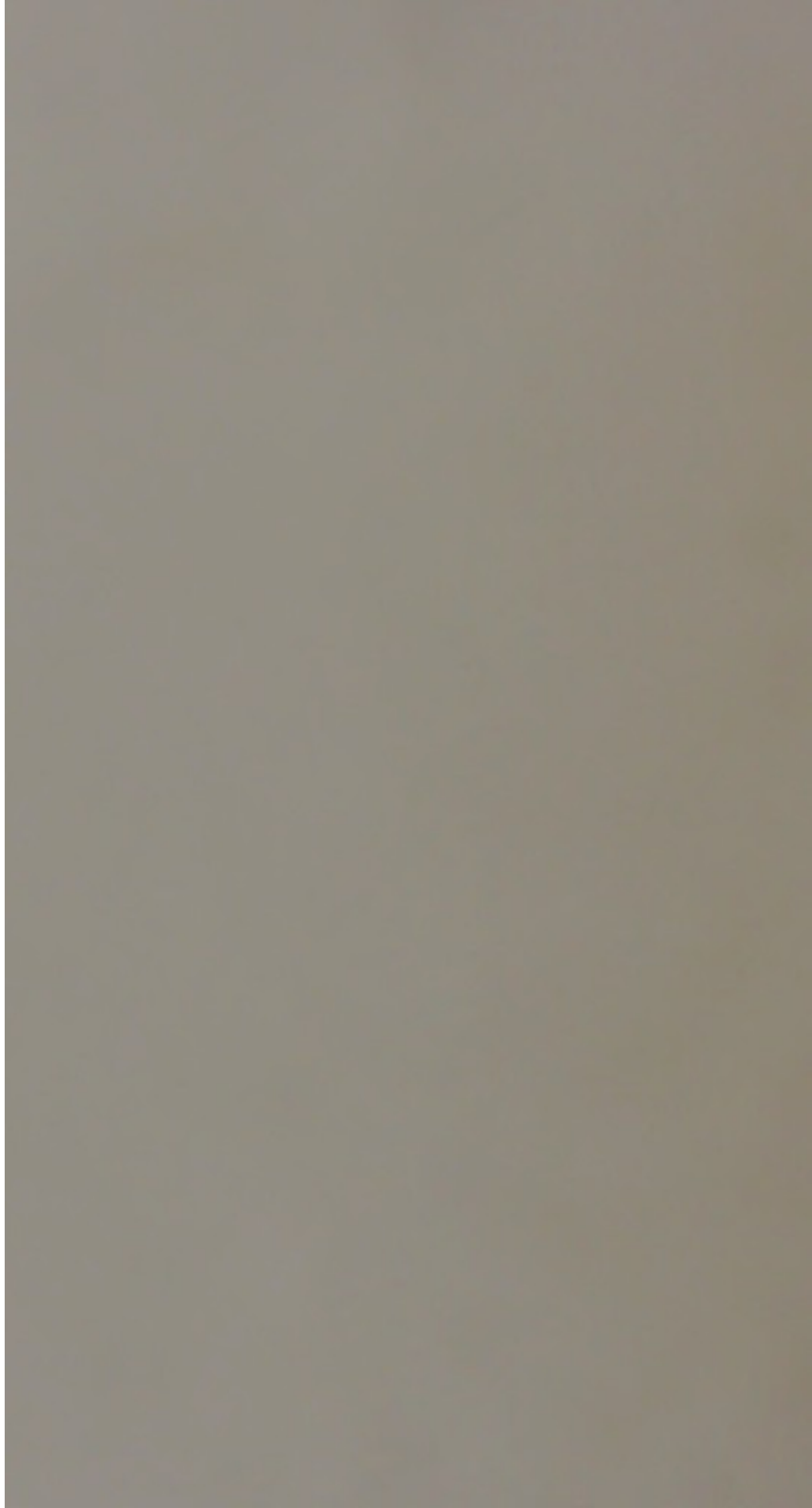
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HINTS

7.

TO

S T U D E N T S

ON THE

USE OF THE EYES.

BY EDWARD REYNOLDS, M. D.

OF BOSTON.

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INTRODUCTORY NOTE,

BY PROFESSOR ROBINSON OF ANDOVER.

It is well known that no complaints are more common in our colleges and other seminaries of learning, than those which relate to the eyes; and there are probably none by which the studies of young men are more frequently interrupted. It is likewise well known, that the source of these affections is very frequently referred at college to the study of the Greek language; while in other seminaries, and at more advanced stages, the blame is in like manner often cast upon the Hebrew. In both cases, the forms of the letters are supposed to produce a peculiar and injurious effect upon the eye. Whether this be true or not, or whatever may be the cause of the malady, the evil itself is so great, that the writer was led to make some inquiries on the subject, of the distinguished Physician and Oculist, Dr. REYNOLDS of Boston. The views which he took of it seemed so just and im-

portant, and the whole path was in itself so novel in our country, and indeed so little trodden in the English language, that the writer could not but urge him to commit his thoughts to paper for the benefit of the public, and especially of those more immediately concerned—the students in our colleges and in our theological and other seminaries. The present article was written in compliance with this request. It is popular in its character, and level to the comprehension of all, while its positions are founded on scientific principles and long practical experience. It strikes at the root of an evil which has robbed the church of many of her most promising sons.

HINTS

ON THE

USE OF THE EYES.

THE Eye is the most wonderfully constructed organ of the body. It is one of the most important to every individual who desires to fulfil the great duties of man, as an intellectual and moral being. Its importance rises in value, when it is considered as the channel of most of our knowledge of nature; and through her, of the wisdom, goodness, and majesty of God. It is the window of the soul. The wonders of the beautiful planet which He created for our temporary habitation, and the sublime splendours of the starry heavens, are all laid open to the mind, through the medium of this exquisitely fashioned organ. By the eye, we penetrate the mysteries of the animal and vegetable creation; and are constrained to adore, in delight, the divine hand, which painted the flowers, and breathed the spirit of life, and gave capacities of enjoyment to such an endless variety of beings. The eye opens to the mind a field of observation vast as the creation, in which it may walk forth, and drink as from a living fountain, the waters of intellectual and spiritual life. How did the heart of "the sweet Psalmist" glow with devotion, when he opened the eye upon the

starry heavens! How did the mind of Newton expand when the same glorious object was painted on his retina. The whole universe is a mirror, into which the eye may look, and see with a clearness nowhere equalled but in the book of Revelation, the wisdom, the goodness, the incomprehensible power, and the unutterable love of its divine Creator!

Milton speaks of the celestial light, that shone inward upon the mind, when the light of the sun was for ever withdrawn. But who that has listened to the divine bard, and heard him tell of things invisible to mortal sight,—who that has walked with him, and beheld the now unearthly beauties of his Eden,

“ Her goodliest trees laden with fairest fruit,
 Blossoms and fruits at once of golden hue,
 ——— With gay enamel'd colours mixed
 On which the sun more glad impressed his beams,
 Than in fair evening cloud, or humid bow,
 When God had showered the earth” —

who that has done this, does not know that all these beauteous images were originally brought by the eye to his soul; that nature, in her richest scenery and loveliest hues, was once painted on his “quenched orbs;” and that if the blind bard had always been condemned to the darkness of the “drop serene,” our eyes would never have been delighted with the unrivalled beauties which his genius has portrayed to them? The eye is the grand avenue through which science pours her rich treasures into the soul. Who does not know, that if Milton's eye had not once poured over the classics and sacred pages, our minds would never have been elevated and instructed by the treasures of knowledge, which his poem contains?

The spirit of poetry was doubtless the living being of his soul. It was implanted there at his birth by nature's liberal hand. It was a portion of himself; and though his eye had never opened upon the holy light, its stirring might have been felt within, and poured forth in song. But we should have looked in vain for the image of the moon wandering through heaven's pathless way; the

flaming of the night-lamp in some lonely tower; the arched walls of twilight groves; the religious light thrown through the cloistered windows; and the many other beautiful specimens of poetic imagery, which are crowded into his inimitable *Il Penseroso*.

Sanderson, though blind from his first years, reached the heights of mathematical science, so that he could comprehend and rejoice in the giant efforts of a Newton's genius. Yet it must be remembered, that by the organs of others he laid the foundations of his fame. Had West and Littleton also been blind, his name would probably have never been enrolled among the mathematical prodigies of his age.

It is, however, unnecessary to attempt to prove the importance of the eye to the happiness and improvement of man; yet it may be well to be reminded occasionally of the value of blessings, which, from being the common property of all, are wont to be undervalued. God's greatest works are often the least regarded. The sun in the firmament shines upon the world, dispensing heat and life and beauty over its surface. We rejoice in its life-giving beams. Our eyes gaze in delight upon the endless forms of beauty ever springing up under its genial rays. How seldom do we pause, to direct our regards to this great source of them all! We forget the blessing, because we have never felt its want. "*Optima fit pessima;*" if I may render it literally, "The greatest becomes the least." So it is with the eye. Through it the mind receives its chief stores of knowledge, and many of its purest streams of joy; but too often we first awake to a true sense of its value, when disease has clouded it in darkness.

The art of printing has added a tenfold value to this organ; as the knowledge of the uses of steam has to the mechanical powers. By the aid of this noble invention, the mental treasures of ages have been gathered together, and brought before the mind. It is now only necessary to open the eye upon these, and the mind may drink from all the fountains of human experience; and learn lessons of wisdom, which were formerly denied to it.

The art of printing opens a high and broad way, where the whole human family, however widely dispersed, may walk, and hold the most intimate interchange of thought and feeling. It brings the present and the past into such close contact, that each generation rises, as it were, out of the past. In one sense, the promise may be said to be fulfilled, that "the child shall be born an hundred years old."

Science, art, literature, all expand, as the eye surveys, on the historic page, the labours, errors, and achievements of the past. But it is in Theology, that the eye appears in its surpassing value. By it, we read the word of life; and through it, the light of heaven shines into the soul. To the man that cannot read—to whom the eye is useless as to books, the opportunities both of intellectual and moral cultivation are exceedingly diminished. How important then to the ministers of religion, who are expected to devote their lives to the study of the sacred page; to priests whose "lips keep knowledge;" who are to hold forth the light of truth to a dark world; on whom thousands depend for all they will ever learn of it on this side the grave,—how important to them is the free and perfect use of this organ!

The abundant facilities for intellectual cultivation, which form the glory of the present age, render those who devote their lives to study peculiarly liable to diseases of the eye. It may emphatically be called *the reading age*. Reading is the fashion of the day. It commences with the child in the nursery; constitutes the chief business of boyhood and youth; and continues through manhood and old age. No period is considered too tender for the all-important business of education to be commenced. No threatening evils are of sufficient moment to stand in its way; no acquirements sufficiently great to permit repose. As one advances in his course, new demands for exertion present themselves; new temptations multiply; new sources of information are thrown open to him. His eyes begin to manifest the alarming signs of inordinate use; but they are too often disregarded, until incurable disease numbers him among

its victims;—and he learns, when too late, that he has closed the widest door of knowledge to the soul; and is left to mourn, with many a kindred spirit, the premature sacrifice of his usefulness and power.

It cannot have escaped the notice of every medical observer, that an unusual prevalence of diseases of the eye marks the period in which we live. Indeed, they are so prevalent, that they may be considered one of its common and peculiar trials. How many cases of afflictive, often of incurable weakness of the eyes, daily present themselves among the studious portions of the community! How many clergymen are annually compelled by this cause, to abate their exertions, or to discontinue them altogether! Among those who devote themselves with ardour to the cause of literature and science, what numbers are obliged by the failure of these organs, to proceed heavily on their course, to abandon its pursuit! Among our statesmen and public officers, how many, from the same cause, perform their duties with impaired energies, and diminished usefulness! How often are religion and learning called to mourn the loss of strong men, to whose valuable exertions the church and the world looked up with hope and confident expectation!

It is highly important, therefore, that the causes which lie at the foundation of this fearful amount of evil, should be clearly ascertained; and the means pointed out, by which they may, as far as possible, be prevented or remedied. In this age especially, which presents such numerous temptations to commit errors that may prove fatal to sound vision, perhaps no better service can be rendered to the cause of religion and letters, than to ascertain these causes and point out these remedies.

It is a prevalent opinion, that a studious course of life almost necessarily produces, sooner or later, debility of the eyes. We believe this to be a mistake; and we appeal to the history of studious men to bear us out in the opinion. Many may be cited of all professions, and in all times, who have used their eyes, to what would almost seem an incredible amount; but who have enjoyed,

notwithstanding, perfect and sound vision, from childhood to hoary age. We do not believe that the great prevalence of weakness of the eyes, among the clergy and others who devote themselves to study, is a necessary consequence of their labours. The eye, notwithstanding the extreme delicacy of its texture, is so constituted as to be capable of great endurance. The Creator evidently formed man to be an intellectual being. He endowed him with mind to be cultivated, and to grow in knowledge. He prepared the eye to be the great instrument for acquiring knowledge. Would it be in harmony with the perfection of his other works, if he had so formed it, as to be easily unfitted for its end? We cannot believe that the most noble organ of the body,—noble because fitted to the noblest end,—is the weakest and the most liable to be deranged and disqualified for the purposes for which it was designed. Its very structure, as well as the history of thousands of the most devoted friends of learning, prove the contrary. Observe the wonderful contrivances with which the Creator has guarded it; the extreme care with which he has provided for its security against the smallest injury. Examine the strong, bony cavity in which it is lodged, and the stronger arches of bone, that serve to shield it in the moment of danger. See the eye-brows and the muscles which screen it so effectually from the injurious effects of too dazzling light—the two curtains, the eye-lids by which it is covered and protected during sleep, and continually cleaned and polished, to be rendered more fit for the ready transmission of the rays of light; the cartilaginous edges, which keep them in shape; and the eye-lashes which guard them from so many dangers, and by the interception of unnecessary light, render the image of objects more distinct and lively. Examine the firm, elastic, insensible membrane, which keeps the delicate interior so secure the power and obedient activity of the iris, ever standing as before the inner temple, a faithful sentinel, to guard its delicate texture from the intrusion of every ray of unnecessary light. Consider too, its universal sympathies with every other part of the body, in which

possesses another strong tower of defence! When we reflect on all this ingenuity and skill employed for its security, and its extreme importance to the mind as well as the body; we cannot feel that the eye is necessarily so weak, as to be, as often seems to be the case, the first organ to fail in its duties. And we are constrained to seek for other causes by which to explain the melancholy fact.

These are to be found not in the use, but in the abuse of the organ. Here is the foundation of most of its diseases. It is an unwise, extravagant expenditure, instead of a wise husbandry of its powers, that occasions the frequent failures, over which literature and religion have so much cause to weep. It is because this most perfect of all optical instruments is not treated according to the optical principles upon which the Creator evidently formed and arranged it. The strongest men, by excessive, unscientific, or too long protracted action, lose those energies prematurely, that were destined to endure to old age. So it is with the eye. It is the firmest organ of the body; but it will not and cannot bear, with impunity, the unscientific or extravagant uses to which, through ignorance and unjustifiable ambition, it is so often subjected. It was the unnatural, protracted, midnight lucubrations of Milton, that "quenched his orb in darkness;" and not their ordinary, natural, and reasonable use. Had he made the eye the subject of proper reflection, and regulated its employment according to the principles of reason and common sense, he would probably have never known the privations of blindness; and though the world might have lost his beautiful Address to Light, he would have continued to gaze with delight on the beauties of nature and the productions of kindred minds, to the end of life.

But the extravagant use of the eyes is not the only way by which they are injured. There are various other bad habits, in which studious men continually indulge; and many mistakes, which they constantly commit, through inattention to this important branch of physical education, that lie at the foundation of ophthalmic dis-

eases; and which only require to be known that they may be avoided. Perhaps no subject so intimately connected with the vital interests of learning, has been so much neglected, as that of the preservation of the sight. There are very few, about which such general ignorance prevails; and none perhaps, that more imperiously demand the attention of all who devote themselves to study. It will be the object of this essay to point out some of these bad habits; to show, in as simple a manner as possible, some of the means by which their baneful influence may be counteracted; and to insist upon the necessity of care and attention in the use of the eye.

The narrow limits and brevity to which the following remarks must be confined, permit this to be done only in a very general manner. The magnitude and importance of the subject demands rather a volume than an essay. But if the few hints that are to be presented effect nothing else, we are not without the hope that they may awaken the mind of some who read them to a sense of the importance of the topic, and perhaps induce them to institute a more faithful examination of it.

I. Few considerations are more important in treating of the preservation of the sight, than that the student should have correct ideas upon the degree and proper adjustment of the light by which he studies; and perhaps none, about which greater mistakes are continually made by studious men,—mistakes which, although by almost imperceptible degrees, most surely lay the foundation of serious weakness of the eyes.

One of the most prolific and least suspected causes of weakness of sight, is the exposure of the eyes to the frequent alternations of weak and strong light. It has caused the destruction of many eyes. Very few are endowed with sufficient strength to endure such changes when often repeated, with impunity. When the eyes are closed, and the light wholly excluded, the sensibility of the retina becomes exceedingly elevated; so that it bears immediate exposure to strong light with great difficulty. The effects are analogous to those occasioned by great and sudden changes of temperature in other parts

of the body. If an individual thrusts the hands for a few minutes into ice-cold water, and immediately transfers it into water in a lukewarm state, its sensibility is so increased, that he will be hardly persuaded to believe that the water is not hot. It is just so with the eye. By long continuance in darkness, the nerve becomes highly excitable, and the blood-vessels easily assume an undue action, which may be readily converted into dangerous disease. The experience of every person affords proofs of this. How unpleasant the sensation, when a lighted candle is suddenly brought into a room, where one has been sitting in previous darkness! How uneasy the sensations occasioned by going from a dark room, where one has been confined for a short time only, to the bright light of day! What protracted debility of the eyes frequently results from long confinement in the partial gloom of the sick chamber! When the exclusion of the light has been complete, and continued sufficiently long, a sudden influx of light to the eye may so injure the nerve, as to produce incurable blindness. Dionysius the Tyrant recognized this principle, and acted upon it, in gratifying his revenge upon his miserable captives. Regulus was cruelly blinded by the Carthaginians in the same way. Instances are on record of prisoners, who, when restored to liberty, after long confinement in dark dungeons, have been urged by the sufferings occasioned by being brought into the light, to beg that they might return to the comparative comfort of their abode of captivity. The story of Caspar Hauser, the interesting but unfortunate victim of a mysterious cruelty, affords another striking example of this principle.

When we reflect upon the fatal consequences of the changes in these extreme cases, and consider how morbidly sensitive the retina becomes by confinement in darkness, we shall be less surprised to hear, that similar changes, though in a less degree, may, when often repeated, as they are by the injudicious habits of students, seriously injure the sight.

The manner in which nature pours the light of day upon the earth, is in beautiful harmony with this principle

or necessity of the eyes. She never does it suddenly. The approach of the sun is ushered in, long before he appears above the horizon, by the faintest possible light; which very gradually increases in strength, until, at last, he appears in his full splendour. This beautiful accommodation of the light to the nature of the eyes, affords a useful lesson on the art of preserving the sight. It secures the organs, in the most perfect manner, from the danger of being injured by a sudden change from darkness to bright light, as they would otherwise be; and as indeed they often are, in those countries where the sun remains so short a space of time below the horizon, that a short twilight is exchanged for the full brightness of day. The inhabitants of those regions are obliged to make an artificial night, by excluding every ray of light from their sleeping chambers; and when they leave these they are of course immediately exposed to the bright glare of the sun. Blindness from amaurotic* affections is a very prevalent disease among them.

A knowledge of these facts, confirmed by the experience of every careful observer, directs us to some very important rules for the preservation of the eyes. A very slight reflection upon our modes of life, discovers many ways in which we continually depart from the above rule; and lay the foundation of serious, and often incurable weakness of the eyes. For instance: We carefully exclude all light from our sleeping-rooms, that our sleep may be less disturbed; and long after the full light of the sun has been shining about our dwellings, we arise, and opening the eyes, suddenly expose them to its bright glare. The bed is placed in such a position, that though the room may not have been thus carefully closed, our eyes are opened, on awaking, upon a bright window. We select, with little judgment, the darkest room for our study; and expose the eyes suddenly, in the various duties of life, to the stronger lights of the other rooms and of the open day. We not unfrequently sit in our

* *Amaurotic, Amaurosis*, from the Greek *ἀμαύρωσις*, *dimness, weakness of sight.*—ED.

rooms after twilight, with the eyes closed, for the purpose of giving them what is considered a salutary repose ; and then suddenly expose them to the strong artificial light of candles and argand lamps ; never dreaming that the uncomfortable sensations momentarily experienced, are the result of injury to the organ. The student is in the habit of surrounding the lamp with thick shades, which darken every part of the room, except the book or paper upon which he is reading or writing ; and alternately turning the eyes from the brightly illuminated surface of the one, to the dull gloom of the other.

These examples are sufficient for our purpose. Many others of similar character, all obvious infringements of this law, will present themselves by considering the habits of studious men. The injury occasioned by each act of disobedience to the plain dictates of nature, is exceedingly slight ; so that it does not arrest the attention. But is it wonderful, that, in the course of months and years, these often repeated injuries, however small, produce diseases ; that the retina, thus treated, should begin to manifest symptoms of irritability ; and finally, when persisted in, refuse to perform its functions ? Indeed, is it not rather wonderful that the sight is not oftener destroyed ?

The relation of the following case here, may be useful, in impressing this important principle on the mind.*
 “ A young traveller, of robust constitution and sound health, arrived late in the evening at his lodgings in an inn. Being fatigued, he fell into a profound sleep, from which he was awaked on the following morning, in the most disagreeable manner, by the rays of a bright sun, which were reflected by the wall and floor of the chamber upon his face. He immediately arose and closed the window curtains, which were unfortunately white, and fell asleep a second time. But the sun soon aroused him more rudely than before ; for its direct rays now shone through the thin curtain, full upon his face. A free secretion of tears, united with a slight redness and a trou-

* Beer, *Pflege gesunder und geschwächter Augen*. [Beer on the Treatment of Sound and Weak Eyes.]

blesome tension of the eyes, were the immediate consequences of this occurrence. These would soon have disappeared, if the sufferer had not on the following morning exposed himself, in the same manner, to the rays of the sun. On the next day he was attacked with a violent ophthalmia, which for a time resisted with great obstinacy all curative measures; and finally left the eyes with a considerable debility and such a predisposition to inflammation, that for a very long time after he was unable to bear the slightest wind, or the least heating of the body, without suffering from red, weak, and watery eyes."

Another case in point is related by Himly, from a small tract entitled "Fabric of the Eye."* "A lawyer took lodgings in Pall Mall. The front windows of the house faced the street, and were exposed to the full blaze of the meridian sun; while the back room, having no opening but into a small, close yard, surrounded by high walls, was very dark. In this room he performed all his labours and studies; but came into the other to his breakfast and dinner. His sight soon became weak; and at last, he was troubled with a continual pain in the eye-balls. He tried glasses of various kinds, and sought counsel of various oculists, but without obtaining relief. At last it occurred to him, that the frequent alternation of light, in going and coming suddenly from the dark study into the bright blaze of the dining-room, might be the cause of his disorder. He immediately hired other lodgings in a different quarter of the city, more favourably situated in regard to the light; and discontinued reading and writing for a while in the evening. This was sufficient, and soon effected a cure."

These cases are very instructive. They show the great danger of sudden changes from weak to strong

* Himly, Ophthalmologische Beobachtungen und Untersuchungen, oder Beyträge zur richtigen Kenntniss and Behandlung der Augen im gesunden und kranken Zustande. [Himly's Ophthalmological Observations and Enquiries or Contributions to correct Knowledge and Treatment of the Eyes, in the Healthy and Disordered State.]

light, and prepare us to feel the importance of the following rules.

1. No man who is desirous of securing the advantage of sound, healthy eyes, should suffer himself to expose them suddenly to a strong light, on awaking from sleep.

The surest mode of avoiding all danger from this source, will be found in a habit of early rising. It is doubtless a law of nature, that we should retire with the evening twilight, and arise when the morning dawns. If all students, especially those who have weak eyes, could be persuaded to conform to this rule, they would be amply rewarded by a sounder and more permanent vision. But when from indolence, the power of habit, or other unavoidable causes, this cannot be done, nature's mode of illuminating the earth should be borne in mind, and the same advantage secured, by a judicious arrangement of the sleeping apartment. A room should never be selected for the sleeping chamber, if it can be avoided, which faces the rising sun. A western location is always preferable, and will be attended with less hazard. Where this cannot be done, other arrangements may be made, by which all the above-mentioned evils can be avoided, and the advantages of a western location secured. Let the bed, for instance, be so situated, that the day-light shall never break in a direct line upon the face; but fall backwards over the head. If the windows are opposite to the rising sun, let them be guarded by curtains or blinds of sufficient thickness to soften and modify the intensity of its rays, and render the light agreeable to the eyes. A simple curtain suspended at the side of the bed, next the head, will be sufficient for this purpose.

2. The apartment selected for the study should be a well lighted room.

This also is a very important direction to all whose professions demand a great and continual use of the eyes. Not only are sudden changes from darkness to light, injurious immediately after awaking from the sleep of the night; but, as appears from the above case, they may, if often repeated, be equally injurious in the daytime. Very few who study much, can neglect this caution, without impairing, sooner

or later, the strength of their eyes. Instances are numerous, where such neglect has induced a degree of irritability that has prepared the way for fatal weakness and disease. Indeed, it can seldom be borne for any length of time without inducing a painful sensation in the organ, which if not removed by more judicious management, degenerates into troublesome disorder, and wholly unfits the eye for long continued, close application. The frequent habit of going from a dark study into the brightly illuminated streets, almost invariably generates a high degree of morbid sensibility of the retina, and intolerance of light, very obstinate and difficult of cure.

3. The individual who devotes the evening to study should never precede his labours by sitting an hour or more in darkness.

Many are in the habit of doing this, with the belief that they are giving the eyes rest, and performing an essential service to them; and preparing them the better for the duties of the evening. But it is a great mistake as will at once be perceived, by bearing the preceding observations in mind. There can be no more certain mode of inducing all the evils of sudden changes of light.

4. The room in which the evening study is performed should be well lighted.

An error almost fatal to enduring strength of the eyes is very prevalent on this subject. Some from avarice, some from mistaken economy, others from ignorance of the true principles which should regulate the degree of light proper for the labouring eye, are in the habit of studying whole evenings, in large rooms very inadequately lighted. We have often seen the student poring for hours over his books and papers, and straining his eyes, by the dull glimmering of one poor candle or lamp. Nay, as if more anxious to save oil than eye-sight, we have seen others, whose lamp was provided with double burners, carefully pull down the wick of one, that there might be no unnecessary waste. When the smarting lids and watering eyes have compelled them to extinguish the other, we have felt more disposed to charge them with avarice, or censure them for ignorance, than to sympathize in their

sufferings. Others provide what is considered by many as the best evening light—the argand lamp; but covered with so thick a shade, that the only part of the room sufficiently illuminated, is the book or paper over which they are occupied. This is a great mistake. A moment's reflection shows that both these are subjected to the dangers above described. In the first case, the eyes become accustomed to a degree of darkness, which, compared with the brighter light of the succeeding day, is very detrimental. In the second, they are exposed to continual alternations of light during the evening; as they are necessarily so frequently obliged to turn the eyes from the highly illuminated surface of the book, to the comparative surrounding darkness of the room.

Nothing exerts a more favourable influence in preserving a healthy condition of the student's eyes, than a proper adjustment of the light during the hours of labour. Perhaps nothing tends more certainly to injure them, and to induce serious debility, than neglecting to secure the advantages of such an adjustment.

Too little light debilitates the eyes, not only by the alternations above mentioned, to which every one who studies by such a light is constantly liable; but it also strains them, by compelling them to inordinate action, in order to obtain distinct vision. The uneasy sensations occasioned by attempting to read or write, for a short time only, by an inadequate light, are sufficient evidence of this. Whenever they are perceived, they should be regarded as the premonitory signs of more serious evils, to which such a habit may lead.

Too much light, on the contrary, dazzles and confuses the eyes. If they are continually exposed to it, as they are in apartments injudiciously selected and lighted, a degree of morbid sensibility will, sooner or later, be induced, and unfit them for the purposes of study.

In northern countries, which are almost perpetually covered with snow, instances of blindness are exceedingly frequent from the great exposure of the eyes to the strong dazzling light, occasioned by the reflection of the sun from their white surface. In these cases, the powers of

the retina are suddenly exhausted by the stimulus of extreme degrees of light. The same effect not unfrequently takes place more gradually, but with equal certainty, when the eyes are exposed, for a series of years, to labour in rooms too much lighted.

From these observations we draw the following rules

5. The eye both in reading and writing, should always have that moderate degree of light, which is best suited to its powers; which produces easy, distinct vision; and which is wholly unattended with any unpleasant sensations.

6. The light of the room in which we study should be, as much as possible, equally distributed. It should never be a reflected or concentrated light. Both these kinds of light, when the eyes are long and frequently exposed to them, are very injurious. Nothing can be more dangerous to the health of the eyes, than exposure to highly concentrated light. The late eclipse of the sun occasioned many melancholy examples of the pernicious consequences of such exposure. The writer has seen two cases of incurable blindness, in individuals who ignorantly watched its progress with the naked eye; and many others, in which vision was seriously impaired. These are extreme cases; but it is not difficult to perceive, that the same cause in a less degree may, in the course of time prove highly debilitating to the vision. They are mentioned to impress the mind with the importance of the direction. The neglect of it has laid the foundation of many a dangerous ophthalmia, followed by weakness of sight, that unfitted the individual, during life, for diligent study.

Nothing, for example, can be worse than the habit of studying at an open window, which receives the strong reflection from an opposite wall, against which the sun shines. The light of a room, where the windows reach to the floor is also injurious. In this case, the light is reflected from the floor up to the eyes, and the apartment is unpleasantly and unnaturally illuminated. It is almost impossible that the individual who studies continually in such a light, can preserve sound, healthy eyes. An apartment into which the direct rays of the sun shine, is much more easily

endured by the eyes, than one where they are thus tormented by his reflected rays.

Nature's light is uniformly and equally diffused. Wherever the eye turns, over the broad surface of creation, this harmonious distribution is pleasing to it, and in perfect harmony with its functions and powers. Perhaps the man who, in the pursuits of literature, is ever immured in his study, especially in the city, surrounded by houses which are continually annoying him by reflected light, cannot, on many accounts, be considered as living in a state of nature,—certainly not, so far as the health of the eye is concerned. Therefore, when he is compelled to occupy such a room, he will, if he sets a proper value upon the unspeakable blessings of a sound, permanent vision, imitate as far as possible nature's method of illumination, and adopt such measures as will prevent the introduction of both the direct and reflected light.

This is easily done. The light of such an apartment should be softened by placing green or blue curtains before the windows. Even the furniture of the study should be such as does not offend the eye by occasioning a concentrated light. It should not be adorned, for instance, with any bright or brilliant objects, upon which the eye cannot repose with pleasurable sensations. The walls should be painted with a soft blue or green colour. The carpet should be of green. This is the colour which nature, who in all her works seems to have provided with much care for the health and comfort of the eye, has so universally painted the world. The nearer her plan can be imitated in the little world where the student is destined to pass such a portion of his days, the less liable he will be to suffer from weakness of the eye.

The expense of this is trifling. But who that reflects upon the value of the eyes, and the unspeakable loss which every one suffers when deprived of their use by disease or weakness, does not perceive at once, that all pecuniary considerations deserve the name of madness rather than a praiseworthy economy?

7. A few words may be proper, upon the quantity of light that is best adapted to evening study. It should al-

ways, as in the day, be sufficient to enable the student to see easily and distinctly, and without occasioning any effort, labour or straining of the eyes. Here, very fatal mistakes are often made. How many students sit for whole evenings, straining the eyes, even till midnight, by the light of one dull lamp! How many think, while they do it, that they are performing an important service to the eyes! How many wonder, that with such prudence and care, they should be obliged to retire from their labour by the itching, painful sensations of the organ; by the watering, redness, and other symptoms, which speak a language so plain, that one would think the most stupid might understand its meaning. The eyes are strained—they have been labouring in darkness; and this is their mode of begging for more light, or repose. They have no organs of speech. If they had, they would make the request long before compelling obedience by the smarting and pain. How many have continued to commit this error, until incurable weakness of the eyes has left them to mourn, when too late, their ignorance and folly!

If the common lamp is used, *two* would, to most eyes, be better than one; since the light of a single lamp, especially if the print is small, is insufficient for easy, distinct vision.

But common lamps and candles are the worst possible means of lighting a study; and cannot be recommended. They are bad, in the first place, because they occasion an irregular, flickering light. The flame is unsteady; especially in the heat of summer, when the windows are open; and in the winter, when so many strong currents are blowing about them. The eyes are often seriously incommoded by this. If candles are used, the best kind are the wax or spermaceti, because they are more pure, and the flame preserves a more uniform length, and a more steady, perpendicular direction. They are also better, because they emit no smoke, and do not deteriorate the atmosphere of the room, like burning oil and tallow. Beer, the distinguished German oculist, recommends four wax candles as the most preferable light for evening study.

In the opinion of the writer, the common argand study lamp, now so much in use, but without the dark shade, for reasons already mentioned, affords the most appropriate light for the health of the eyes. It yields a sufficient light. Its degree can be more easily graduated to the sensibility of the eye than any other. The flame is perfectly steady and uniform, and unaffected by currents of air. It occasions no smoke, and consequently is better adapted to secure all the desiderata demanded on the principles by which our rooms should be artificially lighted for evening study. The ground-glass shade, however, is not the most appropriate, because it produces too concentrated a light, and is therefore injurious to the eye. The best shade is one of oiled paper, which diffuses a sufficient light round the room, and is not, by its glare, offensive to vision.

Before leaving this branch of our subject, there are several other habits, which, in the course of time, may injure the eyes, and are therefore of sufficient importance to be noticed. Their importance perhaps is greater, because they are so common; and because their injurious effects are produced in such an insidious manner, and by such imperceptible degrees, as to be easily overlooked.

1. In connexion with the above remarks upon the injurious consequences of reflected and concentrated light, we would enter a protest against the practice, so common among studious men, of wearing shades before the eyes, when they read by candle light. The majority who do this, with the belief that they are protecting the eyes, and securing them from danger, commit a serious error. This will be seen at once, by bearing in mind the facts upon which some of the above mentioned rules are founded. They keep the eyes in an unnatural degree of darkness, that unfits them for the stronger light to which they are exposed when the shade is removed; and thus they are exposed to the evil consequences described when speaking of the effects of sudden changes from weak to strong light.

But there are exceptions to this rule. They are those

individuals whose eyes are prominent, and stand out far from the head, and whose eye-brows and eye-lashes are weak and deficient. These are deprived of nature's shade, and require an artificial one. The best is a shade of thin green silk, which does not wholly exclude the rays of light, but only softens them. The worst are varnished shades of leather, or any other bright, impervious material. They are improper and ill adapted to the end, because they screen the eye too much, and cause the pupil to be too widely dilated; by which more light is permitted to enter it from the highly illuminated surface of the book or paper, than consists with its healthy condition. The effects are not dissimilar here to those produced by exposing the eyes to a too concentrated light.

2. But we would enter a louder protest against another habit, wholly at variance with all the above principles, and which has prematurely ruined the eyes of hundreds and thousands, and robbed religion and learning of many an able friend. It is the habit of reading and writing by twilight. Nay, some have been mad enough to ruin the eyes by attempting the same by moon-light! They have done both to save time; a most miserable, senseless economy, by which, in the hope of gaining a few minutes, months and years of useful labour have been thrown away. This folly has laid the foundation of many cases of weakness of the eyes, for the removal of which all medical treatment proved unavailing.

3. Another habit requiring a cautionary notice, is that of gazing for a long time at the bright moon. The history of astronomy points to a number of its followers who were for ever blinded by this habit. The disagreeable feeling of tension, and the inexplicable, unpleasant sensation experienced by looking for a few minutes at the full moon with the naked eye, will, on experiment, convince any one that it is a habit dangerous to vision. A little reflection explains it. It is a highly concentrated light; and the dilated evening pupil permits it to pass to the eye in full quantities.

4. There is another habit in which the strongest eye cannot indulge without danger, and which to weak eyes

has proved fatal. It is that of looking at the lightning, especially in the night-time. There is a sublimity in a thunder storm by night, which affords a great temptation to the lovers of nature to commit this error. It is one of nature's grandest spectacles; but let it be remembered, that it is one of the most sudden and extreme alternations of light and darkness that can be presented to the eye—and to a weak eye, would be full of danger.

5. The habit of reading and writing by a side-light should also be avoided. This is an error into which many reading men constantly fall, and by which not a few have impaired their vision. Most men do it without thought. Some, who pay great attention to the care of the eyes, do it from principle. To avoid the injurious consequences of the bent position while leaning over the table, they are in the habit of sitting upright, and holding the book in their hand, in their evening studies, and arranging the light so that it shall shine upon them sideways.

It is a general remark of those oculists who have enjoyed the most ample opportunities for observation, that the left eye is much more frequently the subject of disease than the right; and that when both are diseased, the left is the most affected. They explain this fact by the habit that most men adopt, of reading and writing by a side-light, and generally the left side.

The consideration of the nature of the iris, and the laws which regulate its actions, explains the manner in which this habit injures vision, and predisposes to disease.

The iris, as every one knows, is that delicate curtain provided by nature to protect the tender retina from the injurious action of unnecessary light. When the light is in sufficient quantities to injure the nerve, this curtain closes for the purpose of excluding it. When there is too little light for distinct vision, it dilates to admit more.

But the sympathy existing between the iris of the two eyes, is so perfect, that they always act, more or less, in concert. When one is in the shade, (as it is, for instance, while reading by a side-light,) the other being influenced by it, will be unable to preserve that state of

contraction, which the necessity of the retina requires. Consequently, the individual, while engaged in reading or writing in this position, exposes one eye to the admission of a greater degree of light than is consistent with its healthy condition. With this fact in view, it will appear less surprising, that the student, who continues this injurious practice day after day, and night after night, for a series of years, should, in the end, injure the eye, and expose it to weakness, if not disease.

The bad consequences of this habit are sometimes manifested very early in those individuals whose eyes are weak, by the uneasy sensations produced in the exposed and unshaded eye. Himly informs us, that in early life, when he was in the habit of reading much by this sort of light, he was not unfrequently annoyed, even in sleep, by the pain which it occasioned in that eye.*

The above facts account for the uneasy sensations occasioned by looking intensely, for a long time, through telescopes and perspective glasses, with one eye, while the other is closed.

Of course, these observations are less applicable to the day than to the evening light. The light, in the daytime, is so equally and universally diffused, and so much more in harmony with the healthy functions of the eye, that reading by a side-light is attended with comparatively little danger. The case is very different in the night, especially with men who fall into the unwise economy of saving oil and candles; and who sit, for whole hours, reading by a single poor lamp, which shines indeed upon two spots, the left eye and the book, but excepting these, sheds only light enough upon the other parts of the room, to render the surrounding darkness visible.

But what is the direction that is best suited to the eyes, and is the least liable to injure them? It is that light which is sufficient for distinct vision; and which falls over the left shoulder, in an oblique direction, from

* Himly, Ueber den Nachtheil der Beleuchtung von einer Seite her. [Himly on the Bad Effects of a Side Light upon the Eye.]

above, upon the book or study table. Every study, however situated, may, with little trouble, and very trifling expense, be accommodated with such a light. The advantages arising from it in a long life of study, may be incalculably great.

6. The above remarks show the impropriety and the evil consequences following another bad and very common habit; viz. that of sitting with the back to the window, and holding the book or paper before the eyes, in order to see more distinctly. Whoever does this constantly, will sooner or later experience, whether he believes it or not, the evils of exposing his eyes to a concentrated light, while the pupil is in an unfavourable state for its reception.

7. Another bad habit, which, if much indulged, cannot fail to injure the eyes, is the practice of holding a candle between the eye and the book, for the purpose of obtaining more distinct vision. They only, however, are in danger of falling into this error, whose eyes from natural decay require the aid of glasses.

When the eyes begin to fail from age, and the individual is obliged to remove the book farther off than he has been accustomed to, in order to obtain distinct vision, the image painted upon the retina is proportionally smaller; and of course, the farther the object is removed, the less light comes into the eye. Consequently, the image will be also fainter. These facts, with another, that the pupil is smaller, and admits less light, when increasing years have occasioned long-sightedness, explain the reason, why at that period of life we require more intense light. A true economy of the eye consists, not in thus exposing them to a concentrated light, but in having recourse to spectacles by which these evils are so simply and so easily remedied.

8. With one observation more, we close the subject of light. The student should protect the eyes in summer from the direct rays of a burning sun. The best remedy against this is, that the rim of the hat should be of sufficient breadth to shield the eyes. *Eye-destroyers* would not be an inappropriate name for the narrow things, which, by some of the more recent fashions, are called hats.

II. The above remarks are perhaps sufficient to leave upon the mind some of the most important principles in regard to light, in the management and preservation of the eyes. We now proceed to the consideration of some other points, of equal consequence. It is very important to ascertain the periods of the day, when the eyes are capable of bearing severe labour with the greatest impunity. By possessing clear, definite ideas upon this, and acting upon them, much may be effected during a long course of studious habits, in securing the blessings of sound healthy vision.

1. The morning, after moderate but sufficient sleep, is the most favourable period for study. The eyes, as well as other parts of the body, have been rested and strengthened by the repose of the night, and come with renewed vigour to their task. They are less easily fatigued, and are able to bear greater exertion at that period than at any other. The exchange of midnight for morning lucubrations, would confer, through the beneficial action upon the eyes, an essential benefit upon the cause of literature and religion. We earnestly recommend all to whom these interests are dear, and who are called upon by the circumstances in which they stand to labour in this service, to avail themselves of its advantages. Few changes would conduce more to a diminution of the prevalence of diseases of the eyes among students, than the habit of early rising and securing the advantages of nature's best, purest, and softest light, for the performance of the more arduous portions of duty. They especially would secure an ample reward by it, whose eyes have been rendered unfit, either by constitutional weakness or imprudent management, for long-continued, diligent efforts. The advantages to such individuals, of morning over evening light, are incalculably great.

One precaution, however, is necessary to be observed otherwise, the eyes may be injured by morning light. It is impossible to go, as some do, immediately from the bed to the study table, while the eyes are but half opened and the student may be said to be half asleep. This is an extreme from total repose to instantaneous exertion

All extremes are injurious to the animal frame ; especially to parts of such peculiar delicacy of structure and functions as the organ of sight. Let the morning student, therefore, not be in too great haste, on first awaking from sleep, to be at his books. He should move about for a little space, until his eyes recover from the first weakness that is generally experienced on awaking, before he goes to his studies.*

2. Much use of the eyes immediately after a full meal, is injurious, and should be avoided by all students ; especially those whose eyes are not remarkably strong. Every feeling of the system shows, that nature requires rest from all exertion at this time. Especially does the disposition to sleep, the little inclination for thought, and the heaviness of the whole head, prove that there is a tendency to congestion there, and a peculiar impropriety in tasking the brain or eyes at such a time. The florid look, the turgid, straggling vessels that appear on the *conjunctiva* of the eyes of those who continually commit this error, are sufficient evidence, were there no other, of its dangerous tendency.

3. All labour or study, which strains the eyes much, when the body is from any cause in a heated condition, should also be carefully avoided. The reasons just urged against using the eyes immediately after eating, are equally binding here. There is a general increased arterial action at such times ; and with deep-thinking men, public speakers and others, with whom the brain is in a constant state of activity, a peculiarly increased tendency to congestion of the head and eyes. Consequently, they should not be subjected to any intense action, until the body is rested and cooled, and the general arterial circulation equalized.

* The above directions, however, are not applicable to all. There are some individuals who suffer more inconvenience from using the eyes in the morning than at any other part of the day. Indeed, this is not uncommon with those who have weak eyes. Such persons should carefully avoid all straining of the eyes at this time. They should commence no labour, until the feeling of uneasiness about the eyes, and the slight haze which is spread before them, have disappeared.

Whoever has been warmly engaged in public speaking, either from the pulpit or bar, when his feelings have been excited and he has been animated with a strong desire to infuse the spirit of his own mind into his hearers, is conscious, by his feelings afterwards, that the head is unusually crowded. If he tasks the eyes immediately after by a strong effort, he will be conscious that they are less calculated for it than at other times.

Beer tells us, that he could mention many melancholy examples of distinguished orators, who, from the neglect of this rule, by putting the eyes to an unwise use immediately after delivering their orations or sermons, have in a short time brought on a weakness almost fatal to vision; and who were ever after wholly incapacitated for the performance of the duties of their station.

4. The straining of the eye-sight should also be carefully avoided by artificial evening light. The day-time, as we have said before, is the proper period for hard study. The evening is the period for repose or amusement. Nature has provided a light by day, which, if not spoiled by man's device, acts rather as an agreeable stimulus than as an injury to the organ of vision. It is impossible, when she has withdrawn it from the earth, to substitute an artificial light that is equally agreeable and equally innocent. If the student will be content to study only by the light of nature's lamp, and to repose, when she, for his good, has extinguished it, he will diminish exceedingly the chances of weakened vision. More eyes have been injured by Saturday night sermons, than by the week's study that preceded them. The prevalent error that "a man cannot write until the spirit moves," has unfitted many a ready writer for much useful labour. Through man's native indolence, it will probably destroy many more; for the spirit seldom will move the procrastinating, lazy man, until the setting sun compels him to light his candles for the evening and midnight toil.

5. When the student is obliged to use the eyes much by candle light, he should select such reading or study as is not necessarily connected with great mental effort; since this always increases the tendency of the blood to

the head, and augments the danger of injuring the eyes.

6. When there is no necessity in the case, and the choice is free, writing is preferable to reading as an evening employment, provided it is not attended with any mental effort. It will be found, on trial, to strain the eyes less.

III. The eye has been denominated by a distinguished German writer, a *microcosm*.* “As man,” says he, “is to be considered a little world (microcosm) in relation to the earth upon which he lives, even so must the eye be considered a microcosm in regard to the individual man.” There is great propriety in the term. An examination of the structure of the eye, presents us with the striking fact, that a perfect specimen of each of the different membranes which go to form the whole body, enters into its composition. Each of these various membranes and parts of the organ possesses the same properties and peculiarities, is endowed with the same vitality, and governed by the same general laws, with those to which it is akin. Consequently a mutual sympathy of the most intimate character, is constantly maintained between them. Neither is independent of the other. This sympathy, this mutual dependence, is the subject of constant observation in health and disease. Hence the reason, why the eye is so sure an index of the state of health and disease of the body. Hence its clear, bright appearance, when the harmony of health pervades the general system; and hence its dull, heavy look, when disease has entered the citadel. This similarity of structure and function, can alone explain the great variety of diseases with which the eye is affected. It is the frequency with which this fact is overlooked, that renders their treatment so difficult, and the results so unsatisfactory. There is no organ whose vigour depends more upon the general health of the body than the eye,—none, whose diseases arise more evidently from the derangement of the general health,—

* Beer, *Lehre von den Augenkrankheiten*. [Beer's Treatise on the Diseases of the Eye.]

and none which displays more numerous sympathies with every part of the body.

These important facts present a wide field of thought which the appropriate limits of this essay forbid us to enter ; since it embraces, legitimately, the whole circle of medical pathology. We must be content, therefore, with a few general deductions, such as appear most important to our present design. It is evident from these cursory remarks, that the man who desires to preserve healthy eyes, and sound, permanent vision, has done but little, and will be in great danger of failure, if he does nothing more than to secure the advantages of proper light, and such periods of time as are most appropriate for study.

Whoever would gain and preserve this blessing, must constantly bear in mind, that the eye is a microcosm ; and neglect nothing that is necessary to the preservation of general health. The vigour of the eye-sight depends quite as much upon that, as upon a proper adjustment of the light by which he studies, and a wise accommodation of his labours to fitting hours. No law of physical education can, with safety, be neglected by the man who is desirous of sound, healthy, permanent vision.

These considerations naturally lead us to the following rules, as among the most important preservatives of the sight.

1. The enjoyment of free, pure air, is indispensably necessary to the preservation of healthy eyes.

Who are the individuals that suffer most frequently from diseases of these organs ? They are the children of want, who are almost of necessity confined in an impure atmosphere. This undoubtedly makes an important item in the account. The daily enjoyment of pure air is absolutely necessary to sound health ; and sound health, while it continues, is one of the surest guarantees of sound eyes. But independently of the beneficial effects of pure air upon the eyes, through the medium of the general health, it exerts a very happy influence upon them locally. It is one of the most agreeable and salutary local applications. Whoever, therefore, is called upon to make great use of the eyes, ought to bear this in mind. He

should carefully avoid sitting a long time in an impure atmosphere. The doors and windows of his study should be daily opened, that it may be freely ventilated. The lights by which he reads or writes, should be of such a kind as do not deteriorate the air of the room, by emitting a great quantity of smoke. He should also daily afford the eyes the benefits of the pure external air.

2. The studious man should, daily and regularly when the weather permits, secure the advantages of such an amount of exercise as is necessary to maintain a healthy, vigorous condition of the body.*

Exercise is absolutely necessary. It is necessary for strength. It is necessary for easy digestion. Above all, it is necessary to maintain an equalized state of the circulation. Nothing contributes more than this to secure the eyes from that determination of blood to the head, to which students are so subject, and which is one of the most common causes of diseases of the eyes. The sitting posture of the studious man constantly tends to excite a determination of blood to the head and eyes, by the bent position of the body which he is often obliged to assume for hours, and which obstructs the free circulation of the abdominal viscera. It excites also by the disproportionate amount of action which the brain is called upon to perform. It is not therefore enough, if he would preserve the eyes, that he takes his daily walk in the open air. He should frequently change his position, while engaged in study, and alternate the sitting for the standing posture. He should also occasionally, during his labours, moderately excite the general action of the vessels, and thereby diminish the tendency to a local determination, by taking a few turns round the room.

While upon this subject, several other circumstances, all tending to produce the same effect, require particular notice. We observe therefore further,—

3. That the student should be particularly careful that no part of his dress is so arranged as to interfere with the perfect freedom of the circulation.

* See the author's Essay on Physical Education.

He must ever remember, that a congested condition of the vessels of the head and eyes, is one of the common dangers to which sedentary men and deep thinkers are subject. He must, therefore, never conform to any of the fashions which may increase this tendency. The cravat, for instance, should sit loosely about the neck. Every part of the dress should be so easy as not to make undue pressure upon the abdominal organs, even though it be at the sacrifice of some of the modern, false notions of taste. It will be at the risk of much good health and good eye-sight, if men of studious habits permit the tailors of the present day to be the supreme arbiters of taste.

4. Let the student, for the same reasons, carefully avoid a confined condition of the bowels. Nothing exerts a more unsalutary effect upon the eyes than this. It lays the foundation for obstructions of the abdominal circulation, and consequent congestions of the head and eyes. Hence the dull headach and heavy spirits of the constipated man. Hence the cloudy vision, so frequently attendant upon this state of the system. Hence also the motes and various anomalous deviations from perfect vision, sometimes amounting to actual loss of sight, which present themselves in the costive man; partly from congestion of the vessels of the eye, and partly from its intimate sympathies with these distant organs.*

Costiveness is the peculiar danger of sedentary men. It is one to which their habits, especially their neglect of exercise, renders them exceedingly liable. Its injurious operation upon the eyes is so great, that it cannot be avoided with too much care. It has undoubtedly unfitted the eyes of many scholars for continued labour; and not unfrequently constituted the principal cause that has numbered others among the blind.

The great pressure and straining that the constipated man is obliged to make in evacuating the bowels, pro-

* The bare mention of the fact, that the *tunica conjunctiva*, membrane covering the surface of the eye, is a mere continuation of that which is spread over the internal surface of the whole alimentary canal, may serve to impress these truths on the mind.

duces a determination of blood to the eyes, which every such individual must have noticed. Hence the dark appearance before the organ, if the act takes place in the day-time; and the bright orb which floats before them, if it is in the night. It is caused by a crowded state of the vessels upon the exquisitely fashioned retina, a part capable of bearing less pressure with impunity than any other part of the body. Let it be always regarded as a warning, that the eyes are in danger; and that, if proper precautions are not forthwith taken, amaurosis may be the mournful result. Let it also secure the object for which it is now presented—to impress strongly upon the mind of every lover of sound eyes, the immense importance of guarding continually against this dangerous state of the body.

5. Strict temperance is an indispensable requisite for the preservation of healthy eyes. All who devote their lives to hard study, must bear this continually in mind. Whoever aspires after literary honours, or seeks the rewards of learning, must remember that they are to be found only in the paths of temperance. The pleasures of the mind have no concord with the pampering of the body. To what are we to attribute the clear heads of the ancient philosophers? Their works are not the productions of congested brains. Their eyes looked out upon nature with a clear vision, to the end of life. Unlike the students of the present day, they exercised their limbs as well as their minds. They studied and thought in the open air. The brain was not the only organ that was tasked; and therefore, it was not oppressed with the blood belonging to other parts of the body. Again, they were obedient to the wholesome laws of temperance. Therefore, their vessels were not filled, as is the case with too many of our students, to almost apoplectic fullness. Among the multitudes of our hard students, who complain of weakness of the eyes, a vast proportion may attribute the misfortune to a total neglect of these first principles of health. We pity them when we see them growing blind over their books; and are almost disposed to regard it as among the discouragements of learning.

But a closer examination of their history presents a very different result. Our sympathy may grow cool, if we regard them with a more physiologic eye. It is a love of the flesh, more than a love of the spirit, that too often clouds their vision. It is too much food, crowding with unnecessary blood the tender vessels of the retina. It is too little exercise, allowing these accumulated fluids to settle down into fatal congestion. It is positions wholly at variance with the freedom of the circulation; and various other imprudences, which are the result of carelessness or unjustifiable ignorance. "The day-labourer may eat what he will, provided it is wholesome, and his eyes will not suffer. But let the student who is called upon to devote, not only his eyes, but his brain to severe labour, live upon highly nutritious food, and such as is difficult of digestion, and we shall soon see how his vision will be impaired, through the vehement and persevering determination of blood to the head, which such a course must inevitably occasion." So speaks Beer, whose extensive opportunities of observation have perhaps never been exceeded. The daily practice of every observing oculist, is filled with coincident experience.

6. Sleep exerts no inconsiderable influence upon the health of the eyes. To the man whose profession demands constant use of these organs, it is a subject of great importance. The experience of every observing man affords abundant evidence of this truth. The sleep of the night is as necessary to the health of the eyes, as it is to the health of the body. It is one of the great means provided by the Creator, for the daily renovation of both. A constant, diurnal alternation of activity and repose of all the organs of the body, is founded in the necessities of our nature. Of none of them is this more true than of the eyes. Nothing wears down their powers more certainly, and induces a morbid state of sensibility of the retina, than the deprivation of sleep, continued for a sufficient length of time. Few things promote their health more, than regular sleep.—Hence they reason very wrong, who think they gain time, and bring more to pass, when they steal it from the hours of sleep. Those

scholars are best able to appreciate the importance of a sufficient amount of sleep to the eyes, who have been for years indulging the pernicious, unnatural, and unphilosophical habit of pursuing their studies far into the hours of night, and depriving these noble organs of its soothing influences. They can best describe its consequences; for nature has warned them by the watering of the eyes, the redness and heat of the lids, and the sense of oppression about the eye-balls, that they are treading upon the borders of annoying weakness; and that, like Milton, unless they learn wisdom by experience, they may at some future time feel the woes of incurable blindness.

But the eyes may be injured by too much sleep, as well as by too little. This fact is also proved by the experience of those indolent students, who, like the sluggard of Solomon, find their happiness in "a little more sleep and a little more slumber, and a little more folding of the hands to sleep." The red and weak eyes with which they arise in the mornings, prove that immoderate and too prolonged sleep is unfriendly to sound vision, as well as to sound mind. The experience of every one who is willing to give the subject the consideration it deserves, will, while it enables him to avoid both extremes, direct him to the medium rule of health and safety. Its importance, so fully established by daily observation and experience, and also by a multitude of melancholy facts, proves that in common with all the laws of physical education, which exert so manifest an influence upon health, it should not be disregarded by the individual, who is desirous of securing sound, healthy eyes.

IV. In order to secure the advantage of healthy, enduring vision, the eyes must be subjected to a proper and sufficient amount of use or action. Many men daily impair or destroy their eyes by immoderate use; not a few have done the same by too little. The eye is not exempt from the law of the system, which requires, that each organ must be called upon to exercise its natural functions, in order to obtain its full development, and to secure the advantage of its full powers. It was exercise,

action, that developed the muscles of Hercules. No man can expect the eyes of an Argus, unless he subject them to the amount of action for which they were destined by nature. Oculists daily act upon this principle when they perform an early operation for cataract, where only one eye is affected with the disease. Although it is unnecessary for the immediate purposes of vision, yet they dare not defer it; because they know that the retina from want of use, is liable to become seriously debilitated; so that at a more distant period, the efforts of surgery may prove unavailing. This important fact is illustrated by many daily occurrences. To this in part a want of use, may doubtless be attributed the frequent instances of weakness of sight, in consequence of long continued diseases of the general system. It is also illustrated by cases of Strabismus. The squinting eye after a long continuance of the disease, is always a sightless eye, or nearly so. The patient never makes use of it for the common purposes of vision.

The statement of these facts explains the reason why a total inactivity of the eye occasions debility of the organ. They are sufficient to show that too much repose is one of the most improbable and least philosophical modes of securing strong vision.

Too much use of the eyes, on the contrary, is to be avoided with equal care. How many men ruin their sight by extravagant use! How many gifted men, to whom the church is looking with fond expectation—how many on whom the friends of learning repose with confident hope, are annually numbered among the weak-sighted and blind by this cause! In our schools and seminaries how many boys and youth, urged on by a blind ambition and the folly which is surnamed the "Spirit of the Times," thus lay the foundation of weakness of sight which, in after life, destroys half their usefulness, and buries their brightest expectations in the dust! Among our literary men and best citizens, what numbers destroy their usefulness in society, and lay the foundation of bitter disappointment, by deferring, until it is too late, timely consideration upon a wise economy of the eyes.

Nothing would exert a more important influence upon the interests of religion and learning, especially at the present period of the world, than that just apprehensions of this subject should be disseminated among the studious portions of the community; that its importance should be duly appreciated, and acted upon; and that each one should ascertain the medium path where he may walk with safety.

There is a great diversity in the original power of the eyes. Some are so strong that they are able to endure, through a long life, the most incredible labours. Others are wearied and fatigued by comparatively small exertions. The eyes of some individuals receive a shock from the imprudences of youthful study, before the organs have attained their maturity, and while they are growing; when, like all other organs thus conditioned, they cannot be fully tasked without danger. They never wholly recover from this in after life; and are altogether unfitted by it, for extraordinary duty. In some, the eyes are continually sympathizing with a feeble, diseased frame. Others seem to have iron frames, and consequently iron eyes. Some persons can employ the eyes for days together in the examination of the smallest objects, without the least difficulty; others, on the contrary, cannot endure the same one hour, without excessive fatigue.

It is very evident that the amount of use to which the eyes are subjected, must be varied by these varying conditions. If all attempt the same degree of labour, a certain proportion must fail. The dyspeptic will bend under the burthen, which the day-labourer might carry as an amusement. The amount of study which the eyes of one man are capable of enduring without the least difficulty, will induce incurable weakness or blindness in the eyes of another. It is to the neglect of this simple fact, that we are, in a good measure, to attribute the incredible number of weak eyes among the ranks of our literary men, at the present day.

But happily, amid this great diversity of eyes, modified in power, as they are, by various circumstances and

conditions of the system, there are certain signs resulting from undue use, common to all. A little attention to these will enable each one to ascertain, when he is liable to pass over the bounds of safety, and when it has become necessary that he should begin to relax his efforts, and think of a wise economy of the eyes. They are the following :

1. The focus of vision, (*punctum distinctae visionis*), is brought nearer to the eye than usual—in other words, it is shorter—so that small objects must be brought closer to the eye than the individual has been accustomed to, in order to obtain distinct vision.

2. There is a sensation of painful distension of the whole region about the eye, especially after continued labour which has been attended with any straining of the sight. This, however, soon disappears, after a short repose from study. Let the student close the eyes, and rest them for a quarter of an hour, and he will feel it no more.

3. When the labour has been of long duration, and accompanied, not only with considerable straining of the vision, but also of the mental powers, in addition to the above mentioned sense of distension, the student perceives an unusual feeling of increased heat ; there is a peculiar warmth of the eye-lids, with a difficulty in raising them, and also of moving the eye-balls with their usual facility.

4. If while labouring with the eyes, he attempts to look accurately at some distant object, they involuntarily fill with tears, or at least are more moist than common.

5. A moderate but uncomfortable headach, more particularly about the region of the eye-brows, accompanied by an unpleasant sense of weight, will be felt during or immediately after labour.

6. If the subject is young and plethoric, in addition to the above symptoms, the edges of the lids become red, and somewhat thickened ; and the conjunctiva, the membrane covering the white of the eye, appears more turgid and vascular than in its usual, healthy condition.

7. Finally, a thin cloud suddenly comes, for a few moments, before the eyes ; objects for a short space appear

confused, and unless the eye-lids are closed, a vertigo follows. The moment, however, that the eyes are opened again, all objects are seen as distinctly as before.

This last mentioned symptom is more common with full, plethoric subjects, after misuse of the eyes, than with others. The wise, prudent man will regard them as premonitory signs, that call upon him to think seriously of taking some measures to preserve the health of his eyes. If he does not—if under the influence of a senseless ambition, of avarice, pride or any other improper motive, he disregards these friendly warnings, and continues to strain and use the eyes,—abused nature will utter a louder voice, in the following additional changes.

8. The circumference of all objects appears to be surrounded by a sort of rainbow halo. They will also seem to be in motion, and suddenly veiled with a troublesome glimmer, which changes its situation very rapidly from above downwards; and as the eye continues to look at objects, they will run confusedly into each other.

From this period, he can go forward no longer with impunity. It is a condition of the eye, which, unless arrested by prudent management, may easily degenerate into a weakness of vision that will unfit the individual for extensive usefulness in life; or terminate perhaps in incurable blindness. He has now arrived at a point, at which all delay is replete with danger; and a continued perseverance in study is downright folly.

He may yet be safe. It is not yet to be considered disease; but a sort of middle state between health and disease; in which such a predisposition to the latter exists, that the smallest exciting cause is sufficient to call it into action. The combustible materials have been prepared and collected together; a spark only is required to blow them into a flame.

In the following directions will be found the surest and speediest mode of arresting its progress, and restoring the eyes to a healthy condition.

1. The student should permit the eyes to have a season of repose. His books, sermons, and papers must be laid aside. He must be deaf to the voice of ambition,

avarice, or pride; nay, the pressing calls of duty, even be they those of the pulpit, must be suspended, or modified. We do not mean, however, by repose, a sudden and total inactivity. This may be as injurious as too much activity. But all extravagant use of the organs must be relinquished. Great and fatal mistakes are often made by ignorance of the physiological principles of the eye, when it is in this condition. The patient has often been shut up in a dark room, until the organs became so debilitated that the smallest ray of light, which is their natural stimulus, acted afterwards, when admitted, like an unnatural stimulus, and occasioned an increase of disease. The repose here meant, would be better accomplished by a change, than by a cessation of labour. Where this cannot be done, let the objects about which the eyes have been exercised, be exchanged for others that are less fatiguing to them, and more agreeable.

2. The eye should be often closed during labour, and a few turns made round the room, or what is still better, in the open air. If this is done only for a few minutes, it will be attended with essential benefit.

3. There is generally in these cases an unnatural determination of blood to the eyes. Some benefit may be derived by exciting a deviation to the feet, by immersing them frequently in warm salt water, or water with which a sufficient quantity of mustard or some other stimulant has been mixed, to occasion a slight irritation or warmth of the skin.

4. Perhaps the best of all remedies would be, to abandon books altogether; to leave the city and the study, and journey in the country; to exchange the confined position of the student for the unrestrained movements of the traveller; to excite the whole body by moderate motion; to wander in the woods and meadows, and refresh the misused organ by the green fields and trees, and the endless alternations of nature's works.

5. The eyes, when in this condition, should never be used at all immediately on awaking from sleep in the morning, after meals, or by candle light.

6. In addition to the above, they should be washed frequently in the course of the day, in cold water; which

is an excellent means of strengthening the eyes. We do not mean, to open them in cold water, as some do. This is a bad practice, and often does injury, by abstracting too much heat from the eye, and occasioning irritability and weakness. Simply washing them with the hand is a better and more appropriate way.*

Such are the simple means necessary to restore the eyes to their original condition; to avert the impending danger; and to enable them to return to their ordinary duty. For want of supposed opportunity, through mistaken economy, or from an unwillingness to adopt them, many lovers of learning have been compelled, in bitterness of soul, to retire from its pursuit, and to relinquish all its honours and pleasures. Many have gone down blind to the grave, before half their appointed days of usefulness were fulfilled, little dreaming that loss of vision was only the bitter reward of reprehensible prodigality or unjustifiable ignorance—self-satisfied, perhaps, as martyrs in a glorious cause; when they should have been humbled at the recollection of a precious talent wantonly abused.

When by the timely adoption of these measures, the eyes have again become sound, too much care cannot be taken that similar imprudence does not again bring them into the same condition. The recovery should make a person more cautious, and not more bold. A second attack or relapse is seldom followed with equal success. Whoever is so unwise as to trespass a second time against the eyes, after the above warnings, should not indulge even that hope, that they will again possess that degree of strength and endurance, which fits them for active, continued labour.

Beer states, that those individuals to whom nature has given brown or black eyes, require more caution in the

* The practice of washing the eyes with cold water, is one of the best known and most invaluable means of strengthening the eyes and preserving the sight. The opinion is very prevalent that it is always useful. But there are states of the organ in which the application of cold water is highly improper, and warm or tepid water would be more appropriate. An ignorant use of it, therefore,

use of their sight, than such as have blue or gray eyes.* “Whoever,” says he, “has observed for a number of years the very different degrees of power of different eyes, in a great number of men, will find, as I have done, the irrefutable confirmation of the above truth. By a careful collection and comparison of facts, he will arrive at the same strong conviction that I have, viz. that gray and blue eyes will bear, under the same circumstances, much greater straining than brown or black eyes. Consequently, the acuteness and durability of sight is in a very accurate relation to the varying colour of the eyes. Its power always increases in proportion to the degree of lightness of the iris; and on the contrary, diminishes in proportion to its degree of blackness. For example, dark blue eyes support much less expenditure of vision than the gray; and brown eyes can endure much less straining than the dark blue. Every one may easily satisfy himself of the correctness of this universal observation, by the fact that of an hundred men who have black eyes, scarcely one can be found who is altogether contented with his sight; and also, that dark coloured eyes are subject to amaurotic affections; from which light coloured eyes, under the influence of the same exciting causes, much oftener remain free.

“Since there is no general rule without an exception, so here, we sometimes find individuals with gray or blue eyes, which are from the birth very weak; and *vice versa*. But these exceptions are nevertheless very rare, and

might in some cases prove injurious rather than beneficial. To the healthy eye it is always serviceable.—There is very often with individuals who have weak eyes, a peculiar disposition to close the lids, and a difficulty afterwards of opening them again; also an involuntary contraction of the lids, occasioning a sense of pressure upon the eye-balls, with a feeling of heat, itching, and irritability of the *tarsi*. When such symptoms are present, the local application of warm water will produce more grateful sensations than cold, and do more good. There is no need of erring however on this point, if the effects which follow the application are observed. They should always be grateful and pleasant—if not, they may be injurious.

* Pflege gesunder und geschwächter Augen.

do not in the least degree militate against the truth of my assertions."

If such is the fact—and the authority of its author must, upon this subject, be considered very high,—it is certainly worthy of serious consideration; and deserves a place among other cautions upon the subject of the preservation of the sight.

V. There are some very prevalent habits among studious men, by which the eyes are liable to be injured; especially when they are predisposed to debility and inflammation; and which are indulged in without the least idea that they constitute a cause of danger.

1. The first of these which I shall mention, is the practice of rubbing the eyes on awaking from sleep in the morning, in order to relieve the uneasy sensations experienced at that period of the day—the feeling of stiffness and weight, that is so apt to be present in the much used eye. It occasions irritation; produces a determination of blood to the organs; and not unfrequently slight degrees of redness, which, by frequent repetitions, may easily degenerate into troublesome disease. If much force is applied in this way, it may so derange the functions of the nerve, as to occasion permanent and incurable blindness; of which the following case, related by Beer, is a striking and melancholy example. Its relation may not be without its use, in impressing the importance of the above caution upon the mind. "I was once called," says he, "to a man who had enjoyed a remarkable vision, and who, but a short time previous, had suddenly become 'stock blind.' He was in the company of some familiar friends, when a stranger suddenly came behind him, and covered both his eyes with the hands. Now he was to tell who was behind him. Whether he knew or not, I cannot say; but without speaking a word, he endeavoured to free himself from the pressure. But the more he endeavoured, the more firmly did the other press with his hands; until, when they were removed, he found, on opening his eyes, that the sight was for ever gone."

Many cases are on record, and many annually come under the observation of physicians, which exhibit the

injurious and fatal consequences of pressure upon the eyes. It is, therefore, very easy to conceive, that even a moderate degree of pressure, if frequently repeated, as in the above mentioned habit, may not only increase the tendency always existing in many eyes to irritation and inflammation; but may sometimes actually produce it, and lay the foundation of weakness that might otherwise have never occurred.

2. The eyes, especially when they are predisposed to weakness, are not unfrequently injured by exposure to strong currents of wind. Many date the first attack of what they consider serious disease, to this cause. All whose eyes are weak, are rendered uncomfortable by it. It should therefore be avoided, especially by those who are subject to ophthalmic diseases. When it cannot be wholly avoided, such individuals ought to adopt some measures to modify the impression of the wind upon the eyes. A neglect of this precaution has often converted simple weakness into acute inflammatory disease.

3. Another bad habit is the custom of reading while the body is in a recumbent position. It is a lazy posture, as inconsistent with the health of the eyes, as with the graceful propriety of the scholar. The blood, while the body is thus conditioned, flows more readily to the head and eyes, and subjects them to increased danger, especially when the reading or study is combined with mental labour.

4. The eyes are often seriously injured by being put to too early or too great use after the system has been affected with grave and important disease; as acute inflammations of the vital organs, nervous fevers, or any disorder accompanied with great depletion. Such affections often leave the eyes exceedingly debilitated. The convalescence is very slow; time hangs heavily on the hands of the student; he is weary with the labour of idleness; and the temptation to lighten the burden by reading is very strong. But it cannot be done without danger of increasing the weakness of the eyes, and converting it into obstinate if not incurable disease. There is no condition where the safety of the eyes stands in

greater need of all the patience and self-denial of the student. He should not return to study, until the body has recovered a good measure of strength, and the eyes have sufficient power to be used without any uneasy sensation. The best economy of the organs consists in withdrawing them from all study, and exercising them only with such objects as are pleasing to them; in accustoming them gradually to bear a full light, and adopting the use of such measures as are necessary to re-establish the general health. The old adage, "the more haste the less speed," is peculiarly applicable to the eyes, when the body is recovering from the consequences of serious disease. An unwillingness to conform to it, has condemned many to months and years of diminished usefulness.

5. The habit of exercising the eyes in the examination of very minute objects, is also very injurious to vision. Its debilitating and fatal consequences are not unfrequently seen in those mechanics who are continually obliged to strain the sight in this way, in the manufacture and manipulation of very small and very delicate objects. It is this that renders so many of them amaurotic in advanced age. The student who is ever reading small print, is subjected to the same danger. Indeed his danger is greater, since there are few, perhaps none, of the objects about which the former is occupied, that strain the sight so much as the small type of the latter. For this reason, while we rejoice at the abundant facilities for acquiring knowledge, which constitute one of the peculiar features of the age, we cannot help regretting the multiplication of books printed with very small type, as among its dangerous errors. It has made our eyes ache and water, to see the spirit of a dozen reviews crowded into the narrow space, formerly needed for one. Much as we should rejoice to know, that the poor student, for a small pittance of his earnings, can secure an amount of literature, once attainable only by the more favoured sons of fortune,—yet when we consider the unspeakable value of sound, permanent eye-sight, we feel that the privilege may be purchased at too high a price. The constant habit of reading very small print, is dangerous to strong eyes. To

weak eyes, it may be fatal. It should therefore be carefully avoided.

6. The use of green glasses, so common of late among those who have weak eyes, is another bad habit, wholly contrary to the nature of the organ, and to the true principles of treatment in such cases. Their very general adoption is probably founded on the fact, that nature has spread this colour so profusely through her works; and the very natural inference, that the colour provided by her, and so eminently beneficial to healthy eyes, must of necessity be useful to those which are weak. It has been proved, however, by the experience of thousands, that this opinion is incorrect. Instead of diminishing weakness, in a vast proportion of cases, they increase it. They throw a sombre, melancholy, and disagreeable hue upon all objects, wholly unlike nature's soft and pure colour. The eye is strained by them. When they have been worn for a long time, its sensibility becomes morbidly elevated, and it is unfitted to bear the light, which is its natural, healthy stimulus, without uneasiness or pain.

They are only useful, when the individual is obliged to be exposed to a bright glare of light, for any length of time, which cannot be moderated in any other way; as in travelling over snow when it is highly illuminated by the rays of the sun, or in sailing upon the water, where he is subject to the dazzling and dangerous reflections from its surface. The weak-sighted therefore should only have recourse to them on these and similar occasions, and beware of crippling his eyes by their continual employment.

7. Among the habits of students, which exert an unfavourable effect upon the eyes, the use of tobacco ought not to be passed over unnoticed. There can be no doubt, that this powerful poisonous narcotic, is highly detrimental to the health of sedentary, studious men. It has been stated by writers, that it exerts no inconsiderable influence in the production of amaurotic affections. When its debilitating effects upon the nervous system generally, are considered, we see no reason why the retina, that most exquisitely delicate nerve of the eye, which is allied to

all the other nerves of the body by such intimate sympathies, should not partake in the infirmity produced by this disgusting practice. One thing is certain, that of the vast number of amaurotic patients annually presented to the observation of medical men, a great proportion of them indulge in the use of tobacco. It may do for the sailor, and the day-labourer—for most of the duties of their lives are, in some sense, a practical fulfilment of the principal laws of physical education, which ever tend to strengthen the system, and fortify it against the encroachments of nervous diseases. But it is far different with the student—all his habits are sedentary. His modes of life present a continual series of temptations to break these laws; and render his nervous system peculiarly liable to be injured by all unnatural and unnecessary stimuli. Many other important reasons might be urged against this practice. But the bare possibility that the above opinion may be correct, will be sufficient to the lover of good eyes. “*Sat verbum sapienti.*”

8. Before leaving this branch of our subject, let me warn my readers against another practice that has aided in the destruction of thousands of eyes. It is the ignorant and injudicious use of eye-waters. None know the amount of this evil, except those physicians who have had extensive opportunities of observing the diseases of the eyes. It is so great, and its consequences are often so melancholy, that the very word eye-water occasions pain almost as often as it meets the ear of an intelligent oculist.

When from neglect of any or all the above directions, the eyes have become weak and irritable, crowded with blood, and requiring only a little more action to run on to serious disease, nine men out of ten, nay, nineteen in twenty, have an unhesitating recourse to some nostrum, which goes under the name of an eye-water. In other words, they use some stimulating application, whose only legitimate operation is to give additional irritation to parts already too much irritated. Under its employment, as might be expected, disease increases. But the ignorant notion is so prevalent among high and low, rich

and poor, the wise and the unwise, that a diseased eye cannot be cured without eye-water, that it is commonly the least suspected cause of difficulty. Men abandon that trusty friend, common sense, in diseases of the eyes, as they do on many other subjects. The singular dependence on the use of eye-waters in the diseases of the eyes, is so universally embraced, that it will perhaps be one of the last of the follies of the dark ages that will be abandoned.

The indiscriminate employment of these as a remedy, is, in nineteen cases out of twenty, unscientific and unphilosophical; and wholly at variance with the simple principles of disease. The experience of every sensible observer proves, that in an equal proportion of cases, they produce or keep up disease, instead of alleviating or curing it. Among the host of specific eye-waters, in such general use, there is not one that has not done infinite harm. There is no specific for diseases of the eyes; I had almost said, for any other disease. The only rational mode of treatment in these, as in all other diseases, is that which looks to their causes, and removes them; and afterwards applies such remedies as are in accordance with the simple, philosophical principles which regulate the removal of disease in all other organs. To trust to such means, therefore, when the eyes begin to be diseased, is to lean upon a broken staff. To lose time by such trust, while the causes of disease continue, and to neglect the only proper remedies, is to trifle with one of heaven's best blessings; and perhaps, to squander a gift that may never be regained.

The practice of every physician who has possessed opportunities for observation, is filled with the melancholy consequences of this prevailing error. Since the interests of religion, science and humanity depend so much upon the eyes, perhaps no better service could be rendered to them, than a history of eye-waters, with a full exposure of all the mischiefs they have occasioned, as universally prescribed by the hands of old women, grave divines, lawyers and doctors; and a general diffusion of correct ideas upon the principles of their employment,

in the very few cases for which they may be considered appropriate remedies.

Among the various nostrums vended and used under the name of eye-waters, to the injury or destruction of much good vision, there is one, however, which forms an exception to the above reprobations, and which, should it supersede all others, and be introduced into the same general practice, would doubtless, till the people gain a better light, prove a blessing. This is the famous Paris collyrium.* “An old lady of Paris, whose husband had become famous for an eye-water, had the misfortune to lose her spouse and his secret together. In this dilemma, harassed by applications for the nostrum, she had recourse to the water of the Seine, and was not more gratified than surprised, to find that the collyrium had lost nothing of its virtue. After having enriched herself by a successful traffic, it so chanced that she fell sick; and conscience-stricken at the prospect of death, she applied to an eminent professor of surgery instead of a priest, to relieve herself of the burthen of sin with which her soul was encumbered. ‘Soyéz tranquille, mon amie,’ said the professor, ‘de tous les medecins vous êtes le plus innocent: vos remèdes n’ont fait du mal à personne.’”

From the above observations the following important inference is drawn, viz. The student whose eyes are affected, should never use a collyrium stronger than good river water, without the counsel of some skilful, well-informed physician.

VI. It is a well known fact, that the distinct vision of near and remote objects requires corresponding changes in the conformation of the eye. One office of the muscles attached to it is to effect these changes, in order to adapt it accurately to the ever varying distances of objects.

That such changes actually take place, however unconscious the mind may be of them, is proved by many facts which come under our daily observation. This explains the reason why, when several objects are placed

* Travers on Diseases of the Eyes.

at different distances before us, they do not appear equally distinct at the same time, though both may be in the same axis of the eye. It also accounts for the fact that distant objects appear indistinct and somewhat confused, when we first look at them, after the eyes have been attentively occupied in examining minute objects, and *vice versa*; though by continuing to look at them, they soon present their ordinary distinct shape and appearance. It explains also the fatigue experienced by looking intently at minute objects. It is because the muscles of the eye are wearied, like all other muscles, by intense and long-continued contraction.

It is a law of the muscular system that its power, facility, and readiness of action are increased by exercise, and diminished or finally lost by disuse. Hence the difference in the size and agility of the muscles of the day-labourer and dancing-master, and the studious, sedentary man. The muscles of the eye are under the influence of the same law. The more they are used, the greater the sphere of activity which they acquire. When they are seldom or never used, they become weak and rigid; and are finally incapable of strong, vigorous action. Like all other muscles, too, they become best fitted for that kind of action to which they are most accustomed, and less for an opposite action. Hence the eyes of the student who is continually poring over his books, are best calculated for seeing near objects distinctly; while the eyes that are continually exercised in examining distant objects, are least fitted for the distinct vision of such as are near and minute. This is the reason why sailors, for example, are generally long-sighted; and watch-makers, students, &c. are so apt to be short-sighted.

These facts are by no means unimportant; since they lead us to another direction which may be of some consequence in preserving the sight. It is this. The student whose duties oblige him to be for the most part intently occupied with his books, should not neglect to exercise the eyes also in the examination of distant objects. He should guard against poring continually, or almost without intermission, over his books and papers;

and occasionally look abroad upon more distant objects. When his circumstances permit, let him select a room for his study which is provided with a distant view. By looking out upon this, and exercising the eyes alternately in this manner, he will in the best and most agreeable way relieve the muscles from the fatigue of continued action; preserve them longer in a natural, perfect state; and diminish the danger of being obliged to have too early a recourse to the aid of spectacles.

But whatever care has been taken of the eyes, however judiciously they may have been managed, they must, after a certain period, begin to be imperfect. As age advances, one of its inevitable consequences is a change in the conformation of the eye, which will, in some measure, impair vision. With the progress of years, its humours diminish, its form becomes flattened, and the pupil grows narrower; so that the image is removed to a greater distance from the retina; less light is admitted to the eye; and the muscles have not sufficient power to adapt it to the difficulties of its new condition.

Happily, art has provided an admirable remedy for this difficulty, in the invention of spectacles; by which the student may continue his labours and prolong his usefulness.

Some incorrect opinions prevail respecting the period when recourse may be had to the aid of spectacles. Many, influenced by these opinions, have seriously injured vision by deferring them too long. Not a few have laid up cause for repentance by using them too soon. It is therefore important to lay down some directions, by which each one may determine with accuracy the rule of safety, and ascertain with correctness when his sight may be assisted by spectacles.

The proper period is various in different individuals. Some men require them in very early life. Others enjoy perfect vision without them even to old age. Therefore the question cannot be determined, as has been supposed, by the number of our years. Whether they are to be used earlier or later, depends upon a variety of cir-

cumstances, upon the original structure and conformation of the eye, upon the care with which it has been managed, upon its wise or unwise use in youth, and upon a great number of peculiarities and diseases, ever varying in a thousand different degrees, in different individuals.

But fortunately, whatever are the precise nature and variety of these, there are certain signs uniformly presented in every case, by which each person may determine accurately the precise time when the use of spectacles will be consistent with wisdom and the preservation of his sight. They are the following.

1. The focus of vision is farther removed from the eye. In other words, in order to see small objects distinctly, they must be removed farther from the eye than the student has been accustomed to view them. The usual length of this focus of vision in a sound, healthy, perfect eye, is from sixteen to twenty inches.

2. More light is required than formerly for distinct vision. Hence the habit of old men, of holding the candle between the eyes and the paper when they are reading.

3. Very small objects, when they are closely examined, appear confused, and run into each other. This is especially the case when they are of bright, brilliant colours.

4. The eyes are very easily fatigued by slight efforts and straining, which would not have affected them previously. There is a sense of weariness on viewing near objects, with watering of the eyes, and headach, and sometimes redness of the eyelids—so much so that there is a necessity of directing them frequently to other objects, in order that they may obtain repose.

5. The sight is generally weak on awaking from sleep, and does not fully recover its accustomed power until some hours after—until it has been, in some degree, aroused by the action of light and air.

6. There is always more difficulty in reading small print by candle light than by the light of day.

Whenever any or all these signs are present, the assistance of spectacles is not only proper but necessary. The prevalent opinion, that the longer they are deferred,

the longer the vision will retain the strength of youth, is a mistake. It is a mistake, which has often brought extreme old age prematurely on the eyes. As soon, therefore, as the eye has become sensibly flattened, and the above mentioned inconveniences arise, not a moment should be lost. This is especially important to the studious man, who is obliged to use the eyes much. It is to be considered the voice of nature calling for aid. Either study must be relinquished, or the aid provided; otherwise the eye will be seriously injured by the increased efforts which have become necessary for distinct vision.

Many persons thus injure the eyes by deferring the use of spectacles too late. But this is not the only mistake that is made. They may be also seriously injured, and premature old age induced, if the glasses are not properly adapted to the actual condition of the eyes. If the glass is bad, in other words, if it be not accurately conformed to the actual condition of the eye, the vision will be in greater danger of being injured with it than without it.

Let the principle then be well understood. Many mistake by obtaining glass of too great magnifying power. But this is wrong. A proper glass is not one which magnifies the object, but which presents it as nearly as possible of its natural size—which shews it in a clear, distinct manner, and at the same distance at which the person was accustomed to distinguish objects when the eye was in its most perfect condition. The lens is always too convex, if, in order to procure distinct vision, the object must be brought nearer to the eye than before the sight became impaired.

By bearing in mind the natural length of the focus in a perfect eye, we may always find the safe rule. It is, as before observed, from sixteen to twenty inches. That glass is proper which enables us to read fine print, or which procures easy, distinct vision, at about that distance, and improper when it departs much either way from it. The surest proof that the glasses are too convex, is when the book, for distinct vision, must be brought nearer than

formerly to a sound, healthy eye, *e.g.* eight or nine inches. Let the glass always be selected on this principle and no other. From ignorance of it, or from inattention to it, many have weakened vision and deprived themselves of the blessing of years of useful labour. If glasses of too great magnifying power are chosen at first, the eye will endeavour to accommodate itself to an improper focus, and become so much flattened that it will be difficult, sometimes impossible, as age advances and the sight grows more imperfect, to find any spectacles which will benefit. On the contrary, if they are selected on a right principle, if the focal distance is sufficiently long, so as only to relieve the sight and render it natural, it sometimes happens that the individual is able in future life to diminish rather than increase the power of the glasses, and at last to give up the use of them altogether.

Short-sighted persons require also the assistance of glasses; and by a judicious choice, these will, on several accounts, aid the preservation of the sight. They prevent the straining of the eyes, and save much unnecessary labour. They enable a person also to avoid the unfavourable position of the body and head, which the short-sighted man is obliged to assume; and which renders him more liable than others to congestion of blood about the head and eyes. The following are the signs by which he may determine whether he needs the aid of glasses.

1. There is inability of distinguishing small objects, as common print, at the distance of fifteen or twenty inches; and larger objects, at two feet distance from the eye.

2. There is a disposition to keep the eye-lids half closed while looking at distant objects.

3. The short-sighted man distinguishes near objects in twilight, better than other men. He can read the finest print, for instance, with facility, when the long-sighted man, whose eye is sound, is unable to distinguish the capital letters.

4. He feels a sense of weariness, straining and distension of the eye, by a long examination of distant objects.

With the existence of these signs he should not delay the use of spectacles,—but, like the long-sighted student, he should be careful to make a judicious choice, and select such as are exactly suited to the actual condition of the eye. The glass should never be so strong as to diminish the size of objects, but merely to represent them clearly, distinctly, and of their natural size. If they are not selected according to this principle, they will increase the short-sightedness, strain the organs, and augment instead of diminishing the weakness.

The long-sighted man, as already observed, will perform an essential service to the eyes, by accustoming them, as he advances in age, to the frequent examination of minute objects. The short-sighted man, for the same reason, should be accustomed to the examination of more distant objects. By these means, each will diminish the tendency to an increase of the changes, which are ever taking place, in the course of time.

Such are the principal facts necessary to be mentioned here. There is much other valuable information in books upon this branch of our subject, well worthy the attention of those whose eyes are the subjects of either of the above mentioned imperfections, and which, if well understood and obeyed, will essentially promote the preservation of the sight.*

Great complaint is often made among students, and especially theological students, of the injurious effects of Greek type and Hebrew points. Since they have been frequently regarded as the chief origin and cause of diseases of the eyes, they seem to demand a few observations in this place.

With respect to the former, I would barely remark, that if the type of the author and of the lexicon is sufficiently large and clear, there seems to be no good reason why the study of the Greek language should occasion injury

* Consult Wells and Adams on Vision; Kitchener's popular little work on Economy of the Eyes; Winkler on the Preservation of the Sight, on Optical Principles; and various others.

to the eyes. But while Polymicrian editions of the Greek classics, and such copies as those of Schrevelius' Lexicon are in use, we may expect that weakness of the eyes will be the inevitable consequence. Let the student expend his money wisely, in the purchase of such text books as are printed with a clear, handsome type, and he will not be compelled to suspend his studies for want of sight, and obliged to repeat to himself in bitterness of heart, as he looks over his miserable, closely crowded volumes, the old maxim, "Penny wise, and pound foolish."

Perhaps I may be allowed to suggest, with all due deference to the scholarship of the present day, another cause, to show that the study of the Greek language, is not, as the lawyers say, *malum in se*,—not necessarily hurtful to the eyes. There is nothing more trying to the sight than to be for ever learning—in other words, nothing is more difficult than the practice of a half formed habit; which, through want of application or energy, on our part, never becomes natural to us. What is more difficult, for example, than to be practising a half-learned tune, or attempting to sing an air of which we know next to nothing?

I suspect this principle may be applied to the subject before us. The student often does not become sufficiently familiar with the Greek to read it with ease. This at once explains the mystery. Obligated to pore over a certain quantity every day; to examine words with which his eyes are but little acquainted, and his heart still less—continually shifting his eyes from the page to the lexicon, and from the lexicon to the grammar; his mind, in the meanwhile, perplexed, provoked, and feverish—no wonder that his eyes grow weak! A thorough scholar is delivered from much of this drudgery. At the commencement, when he begins the study of the language in youth, he proceeds gradually, and makes steady but gentle progress; until, at length, the Greek letters are as familiar to him as those of his mother tongue.

This leads me to mention another cause, which, though unsuspected, may occasion weakness of the eyes. Many

of our young men fit themselves for admission to the university in a hurry. Almost every thing is done in a hurry in our country; perhaps nothing more so than the business of education. Thus they are compelled to study day and night, in order to be prepared for the approaching examination. Eyes that have been accustomed to but little use, are suddenly called to steady and laborious action. Can any one be surprised at the result, that such immoderate use of the organ should weaken it? And how easy and natural the inference, since the mode of preserving the sight has been such a neglected subject, that a full amount of the blame should be thrown upon the Greek type! The wonder is rather that so many escape uninjured, than that here and there the eyes of a student are made weak and become unfitted for labour.

Those who are fond of the study of the Greek literature, may undoubtedly injure the eye-sight by immoderate reading, however familiar their eyes may be with text; just as one who is fond of novels, or any other reading, will weaken the organ by reading too long, by an improper light, immediately after meals, &c.

This word meals, suggests another cause of weakness. Some students, who are in the habit of postponing their studies till the last moment, when the recitation, for instance, is to take place in the afternoon, will go immediately from dinner to their books. If instead of such procrastination, they could be persuaded to become familiar with the lessons a day or two beforehand, so that an easy review at this unfavourable hour might be substituted for hard study, the eyes would be less injured, and their progress in knowledge more sure and rapid. All good rules seem to harmonize to produce one result. Their eyes and their minds, if this improvement were adopted, would be strengthened.

So much for the Greek. We cannot believe that the study of it is peculiarly injurious to the eyes. Hundreds, whose eyes appear to be originally possessed of no extraordinary strength, are in the daily habit of reading it with impunity. The injurious effects, therefore, which are at-

tributed to this, should be ascribed to some of the other causes above mentioned. Were it studied wisely, acquired gradually, learned thoroughly, and not in a hurry; were the type of sufficient size, and not read by improper light, we should probably hear little complaint of the dangerous consequences of the study of the Greek language.

With regard to the Hebrew, having never studied it, I can speak only from analogy and observation.

From a slight examination of the Hebrew text, which indeed appears to an unpractised eye "horrible and grim," I should say that the language ought to be studied by beginners with great care. I apprehend that much evil has been created by the neglect of this rule. I have been informed that the young men who enter the Seminary at Andover, are much in the habit of making the study of the Hebrew, which is preparatory to their examination for admission, the work of only a few weeks. Hence, they are no doubt hurried. Sufficient time is not allowed for obedience to the good old maxim, "festina lente." They pursue their studies perhaps to a late hour of the evening, or directly after meals. That which should have been the work of months, is made the work of a few days. No wonder that the eyes by such unwonted action, are strained and weak!

Hebrew points doubtless require a closer attention than the common English letters. Yet there is nothing in them peculiarly calculated to injure the eye, if a knowledge of them is acquired slowly, if the period of study is at first short, and lengthened gradually.

From an observation of facts also, I should conclude that the study of Hebrew is not necessarily hurtful. So far as I can learn, the best scholars in that language are not troubled with weakness of sight.* Unless then those who complain of Hebrew, can prove that some idiosyncrasy exists in their power of vision, rendering them ex-

* This is certainly true of the most distinguished scholars in Europe and America.—ED.

ceptions to the rule established by this fact, they must attribute their weak eyes to some other cause than the Hebrew.

Perhaps they will find, on a more impartial examination, the real sources of evil in some of the above mentioned causes of weakness. No man whose eyes are originally weak, or injured by disease, can expect to put them to great use in the study of any dead language, with impunity. Neither if his knowledge of Hebrew is slight and superficial, so that the text always appears a mystic page, or if it has been studied at improper times, or too intently, or while neglecting the general health, is it fair that its little points should be compelled to bear the blame. It is a maxim in law, that every man is innocent until proved guilty. And while so many other causes of mischief are implicated, Hebrew points may well be acquitted under this equitable rule. Especially if some of the best scholars stand ready to give in their evidence, and testify that the Hebrew language is inoffensive to the eyes, its character must go clear, notwithstanding the complaints of other men.

Let the language be more thoroughly studied—let the eye be made perfectly familiar with it, (and to this end the mind must be master of it,)—let the rules laid down for the preservation of the eyes, in their ordinary every day use, be observed with care; and I should not be afraid to prophesy, that the reproach will ere long be wiped away from the Hebrew—and that it will cease to be regarded as one of the decided enemies of strong and healthy vision.*

* In a note accompanying the manuscript, the author remarks: "It is certain that not a few of the young men from Andover, who have applied for advice, confidently attributed all the woes of their poor eyes to Hebrew; though it never appeared to me so much to be blamed, as costive bowels, want of exercise, and various other mistakes and follies." If it be indeed the peculiar forms of the Greek and Hebrew characters, which thus occasion weakness and diseases of the eye, we must of course expect to find the Greeks and Jews, and also the Arabs,—or at least the learned among these

We have thus, in a very general manner, attempted to go over this important subject. We have endeavoured to explain the principles upon which the light under all circumstances is to be regulated, so as best to suit the labouring eye; to shew the periods of the day in which the organ may be used with the most advantage, and the least danger of injury; and the amount of labour to which it should be subjected, in its varying conditions in different individuals. We have adverted also to its inseparable connexions, and consequent sympathies with the general system; and pointed out some of the important rules necessarily arising from those connexions. We have alluded to some of the bad habits in which students indulge, to the great injury of the eyes; and directed the attention to some of the plain simple means, prophylactic and remedial, which were naturally presented by the views that have been taken of the subject.

If we mistake not, the secret but least suspected causes of much of the suffering and privations of studious men from weakness of the eyes, may be found in the neglect of some of the above principles, or the indulgence of some of the above mentioned errors.

It is obvious that the present occasion has only permitted a very superficial examination of the subject. Its vital importance to the cause of literature and religion demands a more thorough investigation. But perhaps enough has been said, to impress the mind with its importance; and to induce some who may read these pages, to give it the more accurate examination which it deserves.

nations,—the victims of these maladies, a sore-eyed, blinded race. The fact, however, is just the reverse; and we may therefore properly acquit the Greek and Hebrew letters of any intrinsic malignity. The truth seems to be, that any species of characters to which the eye is unaccustomed, and which therefore demand a closer attention than ordinary, tend in a greater or less degree to strain the eyes, and thus ultimately produce disease. Thus a page of Italic is read with much less facility than one in ordinary type; the eye must rest upon it with more intentness, and may thus be overstrained; in the same way that the eyes are strained by the exertion requisite in order to read at twilight.—ED.

In conclusion, we would urge this as a solemn duty upon all who regard their individual happiness, or desire to render their usefulness as extensive as possible, by bringing all the powers which God has bestowed upon them, into full and permanent activity. Especially is this duty binding upon the clergy. They, be it ever remembered, "are not their own, they are bought with a price." They profess to be devoted "body and soul to the service of the Lord." They therefore, above all men, are least excusable, if they wantonly suffer any of these powers, from ambition, neglect, or unjustifiable ignorance, to be squandered or lost.

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