

Is the human eye changing its form under the influence of modern education? / Edward G. Loring.

Contributors

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*Is the Human Eye gradually Changing its Form
and Becoming Near-sighted under the Influ-
ence of Modern Education?*

BEFORE answering this question, which is, in itself, one of the most important which could interest those devoted to Social Science,* since sight is the most intellectual, and therefore the noblest of all our faculties, it would, perhaps, be well for some of my hearers, who have not paid much attention to the details of anatomy and physiology, to define exactly what a near-sighted eye is. This, fortunately, can be done in a few words.

In an optical sense, the only essential difference in all eyes is a difference in length. The length of a normal eye is almost exactly nine-tenths of an English inch; longer than this would be a near-sighted eye, shorter than this a far-sighted eye. The question with which this paper begins might, then, be put in this way: Is the human eye, under the influence of intellectual pursuits, gradually increasing in length?

A direct answer to this question, and one which, indeed, has led to the present discussion of the subject, is found in Ribot's late work on "Heredity," in which it is affirmed that "since constant study creates myopia, and heredity most frequently perpetuates it, the number of short-sighted persons must necessarily increase in a nation devoted to intellectual pursuits."

If this be true, it amounts—since intellectual pursuits are carried on, in the more civilized nations, with an ever-increasing avidity, and are gradually extending themselves with an irresistible impulse into every corner of the globe—to saying

* The following remarks were read in substance, originally, before the American Society of Social Science, Sept., 1877. They were afterwards extended and read in their present form before the County Medical Society of New York, Nov. 5, 1877.

that the human eye is gradually changing its form and becoming near-sighted.

As such a change would be most disastrous to the welfare of the human race, it becomes not only a matter of interest but also of absolute necessity to examine most carefully the evidence of such a change, and if it exists, to devise a method for its prevention.

The evidence in regard to the increase of near-sightedness among the cultivated classes is founded principally on two factors: first, its production and increase through constant study; and secondly, its propagation through hereditary influence.

It is claimed by the majority of writers that even with organs of special sense there is a general tendency of inheritance which controls, to a degree at least, their form and character, and to none of these is this tendency more applicable than to the sense of sight. This view has been almost universally held, not only abroad, but also in this country, and not only by those who have studied the subject in a broad and comprehensive sense, but also by the great majority of those who have made the eye a special study. Thus, the celebrated oculists Jaeger, Stellwag, and Donders, have each declared almost in identical terms what is so forcibly expressed in the words of the last, "that the predisposition to myopia is almost invariably congenital, and in that case it is, moreover, nearly always hereditary. I believe even from time immemorial the conviction has been general among the people." It would be inferred that opinions so general and so strong as these would be founded, not on individual experience or unrecorded testimony, but on careful and elaborately prepared statistics extending at least over three generations. So far as I know, none such exist.

It has been claimed, and with a good deal of right, that the statistics gathered from the statements of the present generation of pupils as to the eyes of their parents are of but little worth. Still an approximation to the truth, even not a very close one, can surely be made; and it must be confessed that such statistics do not show as marked an hereditary

ary influence as is commonly supposed. Out of all the myopic pupils—all of whom were of a sufficient age to answer intelligently, that is from sixteen to twenty-one—I found that only about 6 per cent. had either parent near-sighted. Cohn and Emmert found only 3 per cent. Erismann, however, found 30 per cent. But even with this last amount, which is a very large excess over the others, the fact remains that 70 per cent. of the myopic scholars had parents who were not myopic. I would not wish it to be inferred from this that I put faith only in statistical evidence, for I believe that what may be called legendary testimony, when extending over great epochs, and among many peoples, to be the best kind of evidence, especially in regard to matters which require a great lapse of time for the necessary data. Things which have been in the minds and mouths of all people “from time immemorial” are apt to be virtually, if not categorically, true; and I consequently believe firmly in the hereditary tendency of myopia. It would appear to me, however, that, judging from the power of hereditary influence, which is undeniable in certain directions, and from the fact that variations of particular organs can be increased in degree, fostered, and, by a little care, propagated almost indefinitely amongst the lower animals, which breed rapidly, such as pigeons, Guinea-pigs, and rabbits, the tendency has been to attribute too great an influence to the effects of heredity upon the organ of vision at least, in the human species.

This, I think, has been due chiefly to a want of attention to that law of heredity, which is known as the law of reversion; or rather, since the principles on which it acts are to this day but little known, the fact of reversion—that is to say, the return of an organ, which has been modified, to what it was in a preceding generation before such modification took place. That such reversion does occur is universally acknowledged, and that it takes place in different degrees, in different animals, would also appear to be definitely settled. From evidence already accumulated it would appear to be substantially true that, the higher the grade of the animal, the slower it breeds, and the more perfect a particular organ is for the performance of its function the less likely it is to suffer variation, and the

more likely it will be to revert to its former condition should modification for any reason occur.

It would also appear to be in accordance with the fact of reversion, and indeed directly due to it, that it has been shown to be impossible to alter, to any appreciable degree, the form of certain of the more important organs of the human body. Thus the want of effect in the progeny, from the binding of the feet of Chinese women, which has continued for centuries, and which leaves not a trace of the malformation, is a living protest both in name and deed against the perpetuation of the effects of "the conditions of existence" and the "environment." It is the same with the circumcision of the Jews. An act which has to be repeated with every individual case, notwithstanding that the effects likely to follow the mutilation have been fostered by exclusiveness and intermarriage, unknown to other races, from the remotest times. It is also the same with our own flat-head Indians.

It is of course impossible for the human mind to say that a given organ cannot be improved for the benefit of the race. Still there must be, so far as particular organs are concerned, a limit to improvement. And we might infer from the fact of its resistance to variation, and from the teachings of anatomy, that the human foot, so far as form is concerned, had reached a very high, if not the highest, state of perfection. So too, with the general shape of the cranium. We might indeed *infer* this high degree of perfection concerning these organs, but it seems to me, that we have something much stronger than mere inference, in regard to the eye. Something which amounts, so far as its optical condition is concerned, to proof—proof mathematical, and absolute. This consists in the power which the normal eye has of bringing parallel rays of light to a focus upon its retina without any effort, that is to say, the ability to see clearly remote objects. It is inconceivable, until the very nature of light itself is changed, that there could be a higher standard of perfection. But I must here emphasize the fact that I allude simply to the optical condition of the eye, which is merely a mechanical one, like any other optical instrument, not at all to its power of perception, which might be increased indefinitely.

both as to quantity and quality, nor yet to its power of adjustment, which in its turn might be improved. It is simply as to its perfection in the measure of its refracting power that I speak, and not even to the means or methods by which this is produced.

Now if it be true as reiterated, over and over again, by the great master, if not founder, of the school of evolutionists, that "natural selection can act on each part of each being solely through, or for its advantage," * then it is safe to assume that natural selection cannot act for the further advantage of the optical condition of the eye, which can be proved mathematically to have reached its perfection. We certainly have as much right to say that the normal eye, which can be shown to possess the widest possible range of distinct vision, with the least effort, has arrived at perfection, as we have to declare, that the construction of the honey-comb is perfect as a receptacle, because it can be shown mathematically to possess the greatest possible containing capacity, with the least expenditure of material. The law of "least effort," so beautifully shown to obtain in what may be called the physiology of language, and so aptly applied by the mathematical labors of Haughton and others to the anatomical construction of many of our organs, would seem to have, in the optical standard of the eye, its highest exemplification, as it certainly has its clearest demonstration.

Now as the ability to see distant objects distinctly would be an undoubted benefit to the individual, both as a means of obtaining sustenance and for the purposes of protection, and as this faculty would be more useful to man in a savage state than in a civilized condition, it is safe to assume that the optical condition which would allow this would be developed early and long maintained, until it became to be an example of "that fundamental agreement in structure, which we see in organic beings of the same class, and which is quite independent of their habits of life."

What governs this return of deviation from the type to a normal state is, as already mentioned, almost unknown, but I

cannot help believing, in my own mind, that it is due largely to, and is in proportion to the perfection of the organ.

From what has been stated hitherto, that is, from want of evidence in favor of hereditary influence, by direct transmission on the optical condition of the eye; from the very perfection of the normal standard as it now exists, and the strong tendency to revert to such a standard in case of accidental modification, I should conclude that hereditary influence alone could never, at this late date, so increase the amount of myopia as to change the existing standard, or normal eye, to a near-sighted eye. By this I mean that the comparatively few and sporadic cases of near-sightedness, brought about by fortuitous circumstances, would rapidly become extinct, through hereditary influence, by intermixture with a greater number of normal eyes. Or, to put this a little differently, I believe that the tendency to revert to a far-seeing standard, perfected in the remote past, and maintained probably for cycles of time, would outweigh the tendency to propagate a myopic variation *unless a marked change in the "conditions of existence"—a potent factor in the production of variations—had also taken place*—a change which should be brought to bear not only on a few individuals, but on the great masses of a community, and not only on one sex, but on both sexes alike. And it seems to me that we have no farther to look for such a "change in conditions" than to the fact of modern devotion to literary pursuits, and especially to that phase of it known as "Compulsory Education," a factor of modern origin, of great force, and of an exceedingly rapid growth.

This brings us to a consideration of the second part of our inquiry—the effect of prolonged tension and overuse of the eyes.

Over fifty years ago, Ware, the famous English oculist, called attention to the fact, that myopia was more prevalent among the inhabitants of cities and towns, or among those who applied their eyes upon smaller objects at shorter distances, than it was among the inhabitants of the country, where the application of the eyes was less, the objects greater, and a greater distance. Moreover he showed, that the near-sightedness, both in fre-

quency and in degree, increased, up to a certain point, with the age of the person, and the amount of close application.

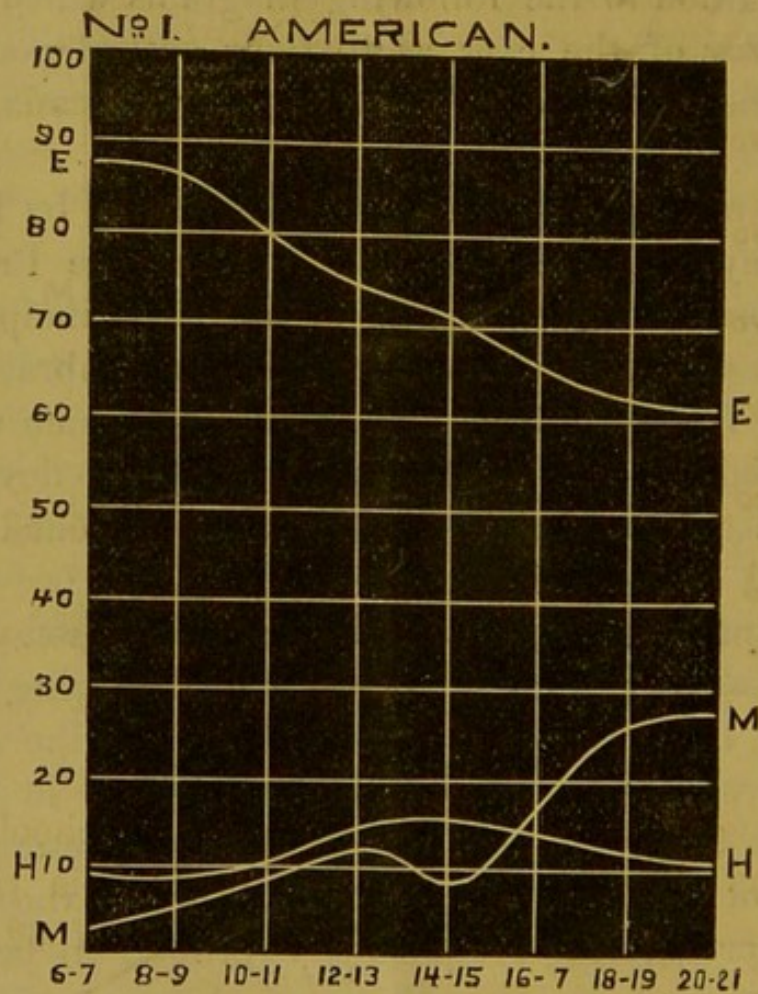
These important facts were corroborated subsequently by many observers, but especially in late years by Cohn, in Germany, whose elaborate statistics made some ten years ago have served as the beginning of a series of statistical examinations, which have been carried on with great fervor, not only on the continent, but also in this country. As an example of the method in which these investigations are made, and for the purpose of illustrating many points to which I shall refer, I would call your attention to the following diagrams which represent the examination of the eyes, as to their optical condition, of scholars in the public schools of New York, Russia, and Germany.

The examinations in New York were made by Dr. R. H. Derby and myself, through the kindness of the President of the State Normal School and some of the principals of the grammar schools. The American diagram embraces the results gained from 2,265 eyes, every one of which was tested separately and in the most careful manner; deviations in length equal to one-tenth of a line being reckoned as abnormal.*

The examinations began with the younger classes, and progressed successively to the higher, the results being tabulated, not, however, in reference to classes, but as to the age of the individual, every two years making a division in the series. The numbers at the bottom of the chart represent then the progression of the ages of the scholars, while those running vertically represent the frequency, expressed in per cent., in which the various optical conditions of the eye occur. It may be remembered that in my earlier remarks I have said that all eyes may be comprised in three great classes: 1st, the normal eye; 2d, the myopic eye; and 3d, the far-sighted eye. As the normal eye is one in which the axis is of the proper length, it is called, from the Greek, an emmetropic eye; the near-sighted eye, in which the axis is too long, is called a myopic eye; and

* Or, to speak in technical language, $+\frac{1}{10}$ and $-\frac{1}{10}$ was taken as the lowest degree of H. or M.

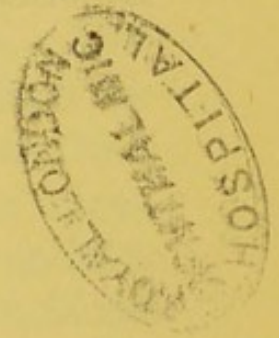
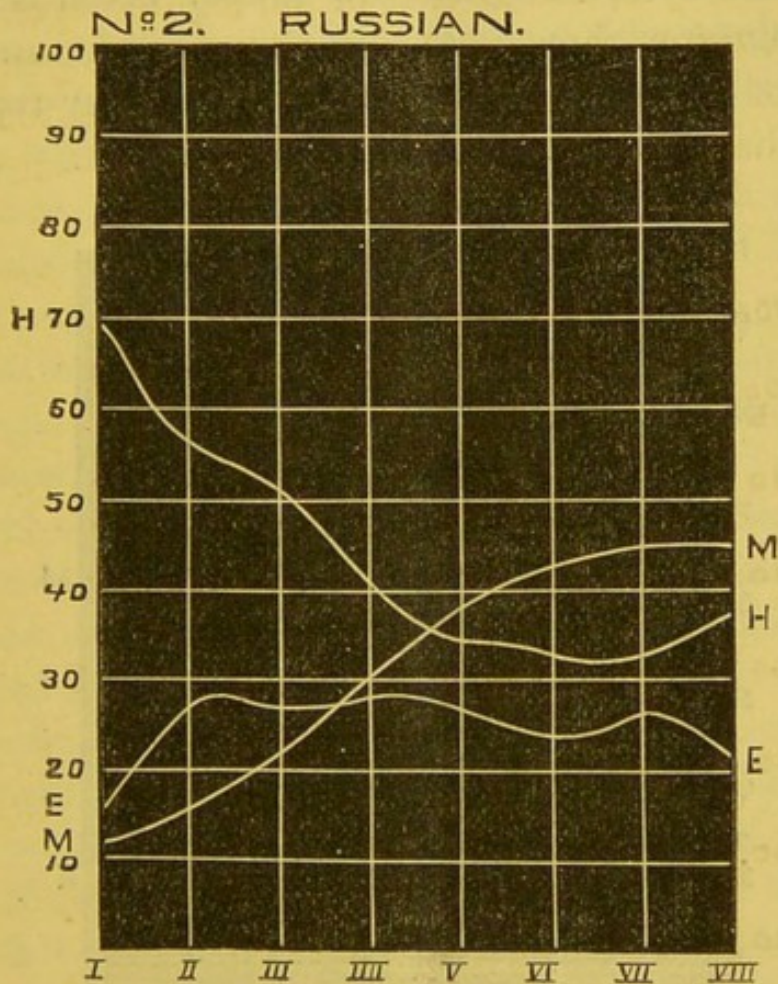
the far-sighted eye, in which the axis is too short, is called hypermetropic eye. All that will have to be remembered of these names is that the letter E, for example, is attached to the curve, or line, denoting the per cent. of the normal eye in the various years; M to the line which represents the percentage of near-sighted eyes, and H that of far-sighted eyes. Thus, in the lowest division, that is that representing the years 6-7, the proportion of normal eyes to all other eyes, is found, in the American diagram, No. 1, to be 87 per cent.—an enormous



proportion—while in the last years, 20-21, it has sunk to 61 per cent. The far-sighted eye, starting from 9.47 per cent. in the lowest years, ends with a very slight increase in 12.24 per cent. in the highest years.

While the myopia, on the other hand, from being only 3.5 per cent. in the 6th and 7th year, rises in the 20-21 to 26.78 per cent., an increase of over sevenfold. [See Table p. 26.]

The second diagram * shows the investigations of Dr. Eris-
mann on 4,358 eyes of the scholars in the schools of St. Peters-
burg, where precisely the same thing occurs, only the myopia
rises from 13.6 to 43.3 per cent. The third diagram shows the



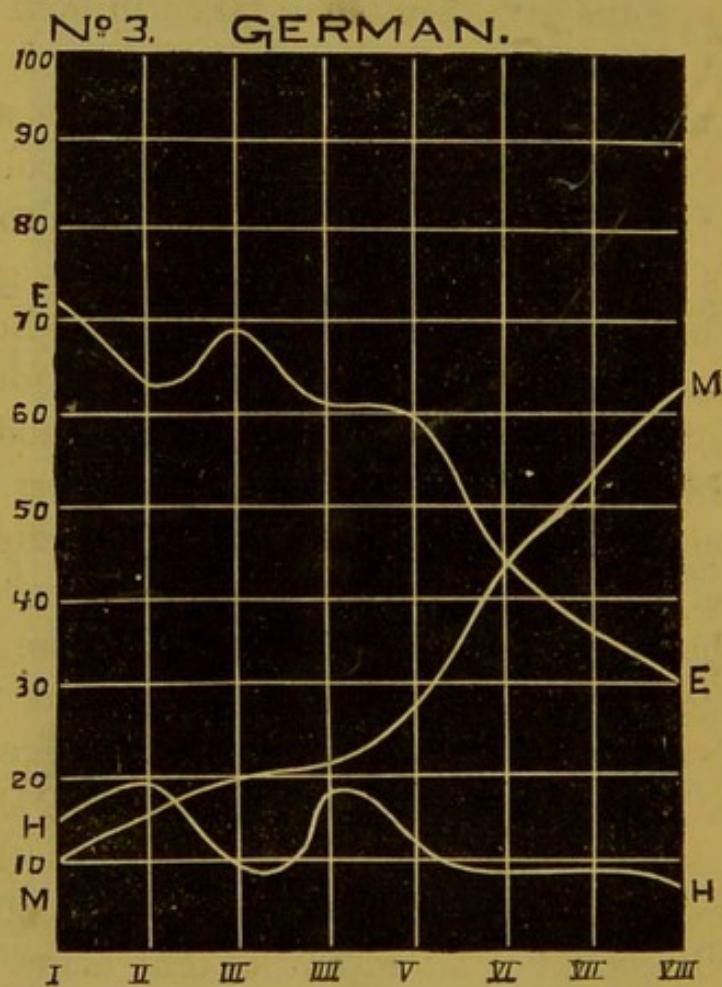
investigations of Dr. Conrad on 3,036 eyes of school children
in Königsburg. Here the percentage of myopia rises from
1.1 in the youngest, to the enormous amount of 62.10 in the
highest.

These results might also be reinforced by those of Reuss, in
Vienna, on 1,050 pupils, where the rise was from 33 to 60 per
cent., and by Dr. Pfleuger, of Lucerne, where the rise in near-

* It will be seen that in the Russian and German diagrams, the progression
at the foot of the chart is not as to ages, as in the American, but by classes.
But as the successive classes of the one correspond almost exactly with the
successive ages of the other, this can make no practical difference. As it is
the results of the school term, that is, from 6 to 21 years, which interests
us here, the comparison between the countries is a fair one.

sightedness, from 7 to 21 years, was from 0 to 61.5 per cent. while, in corroboration of the results represented in the American diagram, the statistics gathered by Drs. Prout and Matthews, of Brooklyn, Dr. Cheatam, of New York, and Drs. Williams and Ayres, of Cincinnati, may be cited.

Those placed on the charts are simply taken because they happen to agree with each other in the condition under which the examinations were made, and because they represent the



results of countries widely separated from each other. Now it will be noticed that differ as these curves may in degree in the different diagrams, one thing is common to them all, and that is, that there is in every case a marked increase of myopia with the advancing years of the school term.

From this fact alone it has been asserted that the influence of study on the development and advance of near-sightedness may be readily appreciated. Still it must not be forgotten that near-sightedness is a condition which is very apt to occur be-

between the ages of 7 and 21 and this too from other causes than study, and entirely independent of it, such as scarlet-fever, measles, and other debilitating diseases. Thus in any body of persons whether subjected to close application of the eyes or not, the percentage of those who were near-sighted would be greater at 21 years than at a less age. In order to show that the increase in near-sightedness is due to devotion to study, it would be necessary to compare the amount found where the application was greater with the amount where the application was less, those of the same age being taken in both cases. This has been done by Ware, Becker, and Cohn of Breslau, the latter of whom found that while in the village schools there were only 1.4 per cent. myopic, in the city schools of a corresponding age, there were over 10 per cent. So also the statistics taken in this country show that the myopia is greater in the Eastern and older cities than in the Western, where the application is less. But more than this, Erismann found by close examination that those scholars, in the same schools and under the same influences, who studied most, were most affected with near-sightedness. Of his 4,358 scholars all studied two hours out of school, some four, some six, and others over six hours. Of those who studied only two hours there were 17 per cent. near-sighted; of those who studied four hours 29 per cent., while of those who studied six hours there were *over 40 per cent.* This is a most important statement, and shows, as conclusively as statistical evidence ever can, that the disproportionate frequency of myopia among the older scholars is due to the increased amount of labor, and to that alone. The objection of course is that the younger scholars, where there is naturally the least myopia, study the least out of school, while the older scholars, among whom there would be more near-sightedness from other causes, study the most.

It is from such evidence, supported by such statistics as these, that the opinion that near-sightedness is proportionate to the amount of study, has become fixed, not only in the minds of the world at large, but also of those trained oculists who have devoted a large portion of their life to its study. Thus, Prof. Donders, probably the best authority on the subject,

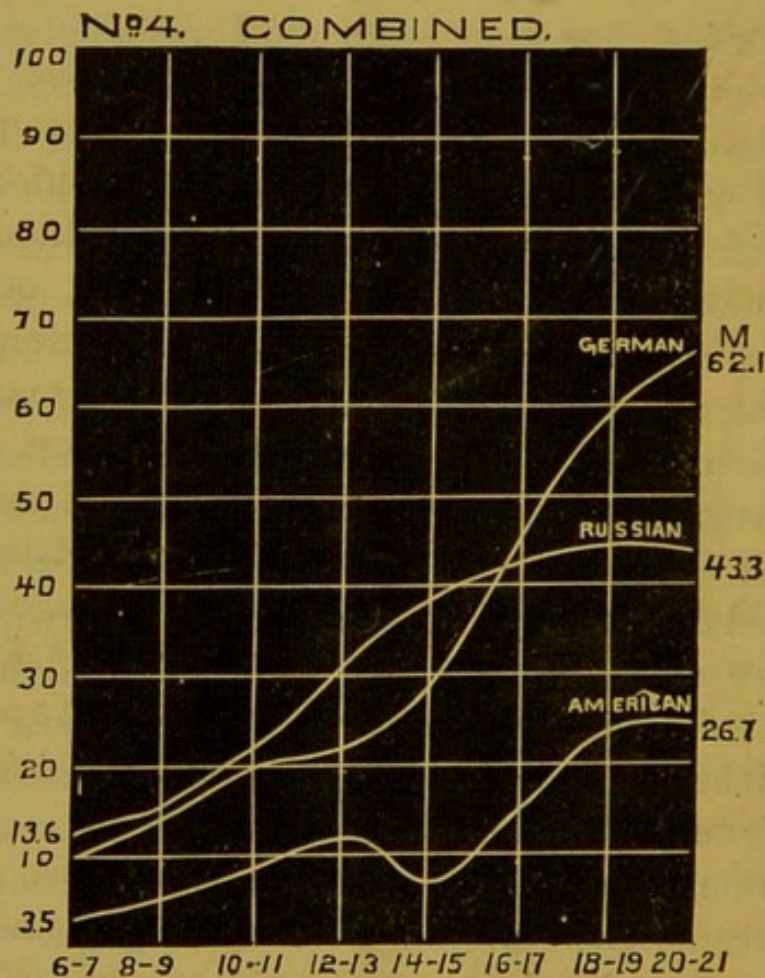
states that "the distribution of near-sightedness chiefly in the cultivated ranks, points directly to its principal cause—tension of the eyes for near objects. Respecting this fact there can be no doubt." And yet others whose opinion is entitled to almost if not quite as much weight declare, as Prof. Jaeger has, that "near-sightedness is not the prerogative of industry," that is, it is not the direct attribute of close application, and it certainly cannot be denied that this opinion, contrary as it is to the general belief, has some strong support to rest upon.

In the first place, even if we admit, as I think we must, that there is more myopia among the so-called cultivated classes than among the middle and lower, it would be exceedingly difficult to show that the liberally educated classes applied their eyes more closely, or for a larger time, than those who are engaged in many pursuits which are not of a literary character. For example, it would be difficult to prove that the wealthy classes, including merchants, professional and literary men, actually used their eyes for more hours a day, and on finer objects, than jewelers, engravers, draughtsmen, seamstresses, type-setters, and others engaged in many other confining and long-continued occupations, which certainly do not show any tendency to near-sightedness, while the professional and literary callings do. The poor seamstress uses her eyes more hours and usually with a poorer illumination, than does the lawyer and the type-setter more than the author, and if it was simply the result of continued application, the former ought to show more near-sightedness than the latter. There is an apparent contradiction here (and that it is apparent only I hope to show later), which has led the minority which, if small, is nevertheless strong, to declare that the near-sightedness in the upper and educated classes is not due to excessive application, but principally to hereditary influences.

One of the most instructive, and at the same time one of the most interesting links in the chain of evidence in regard to this matter, is that offered by contrasting the frequency in which near-sightedness occurs in different nations. Thus Donders declares, to use his own words, that "near-sightedness is more specially proper to cultivated nations, and that among

the States of Europe visited by him, that he nowhere, in general life and in clinics, met with relatively so many myopes as in Germany." On the other hand, the absence of near-sightedness among savage people and tribes has been commented upon by Lunari, and especially by Macnamara, and his remarks upon the subject are so important that I give them in his own words: "It is remarkable," he says, "how few cases of impaired vision due to anomalies of the refraction and accommodation of the eye we meet with among the lower classes in India. In fact whole races of people appear to be actually strangers to these diseases. For instance, some years ago I was among the Southals, the aborigines of Bengal, dwelling among the Rajamahall hills, and I took every opportunity of examining the eyes of the people I was brought in contact with, for the purpose of discovering if myopia and such like diseases existed among them, but I never yet saw a young Southal whose eyes were not Emmetropic (normal), the abnormal condition, so far as my experience went, never depended upon anomalies of refraction or accommodation." To this may be added Dr. Callan's investigations in regard to colored school children, among whom he found less than 3 per cent. of myopia. Nevertheless it has been declared that this greater frequency of myopia in Germany is more apparent than real, and is due to the fact that the Germans recognized the utility of glasses sooner than other nations, and hence their use became more general, and the existence of near-sightedness more conspicuous. And it has for this reason been maintained, that if the people of this country overcame their prejudice to wearing glasses, that the evil would be found to be as great and as conspicuous as it is in Germany. But in answer to this there is the evidence of actual statistics in which the scholars of each country were examined not only with glasses, but in every other way which might insure a correct result. And in fact if we look at diagram upon which the myopic curves of the different nations have been arranged side by side, it will be seen that while the Russian shows 43 per cent. of near-sighted scholars, and America only 27 per cent., Germany shows 62 per cent. Now whatever may be thought of her cultivation, Germany is con-

fessedly one of the most, if not the most studious, of the nations of the earth, and it would seem to follow directly that the near-sightedness was due entirely to the excessive use of the eyes on books. Yet I think this by no means so clearly follows, for I believe that there are other factors in the production of myopia prevalent to a degree in Germany, which do not exist to the same extent in any other so-called cultivated race, such as peculiarities of food, indifference to ventilation, disregard of other hygienic requirements, want of out-of-door



exercise, and a peculiar tendency towards a sedentary life, all of which are provocative of a certain laxity of tissue, and want of resistance in the investing membranes, which finds its expression in the eye in a distension which is in fact myopia. This is strongly corroborated by the fact that in the examination of children in New York, those of German parentage showed a greater percentage of near-sightedness in the same schools and under the same influences than did the children of other nationalities—the German being 24 per cent. myopic

the American 19 per cent., and the Irish only 14 per cent. Pflüger's * statistics in regard to the comparative frequency of myopia among the Swiss teachers agree with this, since those from French cantons showed only 14.3 per cent. myopic, while those from the German 24.3 per cent., or nearly twice as much.

All this certainly shows that myopia is more prevalent among the Germans, and is of importance in showing that the near-sightedness among them may be produced from other causes besides that of excessive study, but it does not militate against the fact that as a rule the greater the amount of study, the greater the near-sightedness in each and every nation.

Another most interesting point in the evidence, not only in showing the greater frequency of near-sightedness in some nations over others, but also in answering the question in regard to whether a nation is likely to become near-sighted, is offered by a consideration and comparison with each other of the character of the curves themselves in the different diagrams. Thus it will be seen that, in the Russian and German diagrams, Nos. 2 and 3, not only does the curve marked M, mount higher than it does in the American diagram, but that it crosses the curve representing the normal eye at the early age of some 16 years in the German, and at the still earlier age of 13 years in the Russian. That is to say, that after the 16th year, near-sightedness is the predominating condition of the eyes of all the scholars, and that in the 21st or last year, *there are over twice as many near-sighted as normal eyes.*

If we look at the American diagram No. 1, we see that the line representing the amount of near-sightedness not only does not ever cross that representing the normal eye (E) but never even approaches it—the normal eye remaining by far the predominating condition in every age of life. This agrees with what Donders † found among the Dutch, that is to say that the normal emmetropic eye was by far the most prevalent condition of refraction, or, in other words, there were four times as many normal, or emmetropic eyes, as myopic and hypermetropic, even when as low a standard as $\frac{1}{96}$ was taken. When $\frac{1}{48}$ was

* Zehender, September, 1875.

† Refraction and Accommodation, pp. 341–342.

taken, which was about the standard used by us, there were nine times as many normal as near-sighted and far-sighted together.

There is still another interesting as well as instructive, perhaps the most instructive point which is offered to our consideration by the comparative frequency with which near-sightedness occurs in different nations. It has been shown I think from the statistics and facts brought to your notice, that the statement of Prof. Donders that near-sightedness is greater among studious nations, is virtually true, and it ought to follow logically that where the near-sightedness in a nation was less the cultivation and literary achievement would also be less. If this were true, in anything but the most general way, then at least there would be a reason for this excessive instruction advocated by so many, and the increase of near-sightedness would then have to be considered simply the price that we should pay for devotion to literary pursuits. Is it however true that a non-myopic nation is also a non-literary nation? It is universally admitted that there is very much less near-sightedness among the English than there is among the Germans, and less even than among ourselves, so to speak, their first cousins, and the fact that among the scholars descended from Irish parentage there were only 14 per cent. myopic against 19 per cent. American, would rather support such a conclusion. Are the English an unliterary race? Can any other nation in the world, not only of our own immediate time but for the past four hundred years, produce so brilliant, so continuous, and so full a list of poets, dramatists, historians, scholars, statesmen, orators, philosophers, and novelists, as she; can, in fact, all the other nations of the earth combined, ourselves included, offer such an array of names in every department of literature? Now does any one suppose that all this was achieved without labor, that is without study, without the use—oftentimes the excessive use—of the eyes? and yet we are told by one of their own professors, Matthew Arnold, in a work on the higher schools and universities of Germany, that the schools of England are not only bad of their kind, but inadequate in number, and who declares, while contrasting the higher university education

of Germany and England, that in the latter no such thing exists. "This entire absence of the crowning of the edifice," she says, "not only tends to give us, as I have said, a want of scientific intellect in all departments, but it tends to weaken and obliterate in the whole nation the sense of the value and importance of human knowledge." What was the knowledge of Shakespeare, Bacon, Newton, Young, and Burke, but human knowledge, and human knowledge of the highest kind that the world has ever produced? What was the intellect if not scientific, of Dalton, Davy, Faraday, Herschel, Brewster, Airy, Darwin, Huxley and Tyndall, Hamilton, Thompson, and a host of others, all of whom are of Mr. Arnold's day and generation, most of whom his immediate contemporaries? If there is a "want of scientific intellect" in these men, where shall we go to look for it? And yet Mr. Arnold declares in so many words, "in the English schools, when I knew them, the natural sciences were not taught at all;" and not content with this he further declares "that exactly the same effect, which in the field of University teaching our want of any real course of superior instruction produces, is produced in the field of the applied sciences, by our want of special schools like the schools of arts and trades in Paris, or the Gewerbe Institute in Berlin, or the Politechnic at Zurich."

What, then, has Germany produced in the last century in the way of applied sciences, that Mr. Arnold should be so anxious for her system of education? Did she discover electricity and apply it to the telegraph, or to the telephone, or to the predictions of the weather? or steam, and apply it to the railroad or the steamboat? or did she invent the cotton gin, the sewing machine, or the reaping machine? Has she, in a word, with all her methods of instruction, surpassed or even equalled her compeers in originality of invention or even in successfully applying the various arts and sciences for which this century has been renowned? and is it not true that there is scarcely a piece of German mechanism that does not betray itself at once, by the cumbersomeness of its workmanship, and the weakness of its construction? I cannot help thinking that Mr. Arnold would not have cried with so passionate a longing for German

industrial schools had he seen the examples of applied sciences of Germany and his own country side by side, at our late exposition, or read the official report of the German Commission in regard to the utter inferiority of their work; or had he known that she would be the only country in Europe, whether at peace or war, to whose interest it would not be to enter the coming exposition at Paris. Nor, perhaps, would he have wished for the schools of Zurich had he also read the official report of the commissioner from Switzerland in regard to their chief industries, the watch trade of Geneva, or the silk trade of Basle.

There are indeed few countries that have made a greater or more successful use of applied science than England. And does any one suppose that all this mechanical work, with its infinity of detail and precision of adjustment, has been accomplished without severe application of the eyes? yet the English mechanic is far freer from myopia than the German.

I have been led into a comparison of these two great nations without the slightest intention or wish to exalt the attainments of one or depreciate those of the other. No one recognizes more fully, or appreciates more highly than I do, the great achievements of Germany, especially those in the art* we practise, and more especially still, in that limited part of it, in which it can be literally said that some of us here to-night live and have our being. Still, the question has arisen in my own mind, whether, after all, the results gained in Germany in the last half-century, or since her method of compulsory education has been in operation, were proportionate to the tremendous expenditure of force used in producing them, and whether that morbid reverence for and dependence on authority, that accumulative and endless repetition of the opinions and dogmas of others, without which no task is ever undertaken, have not cramped her originality and crippled her invention.

Whatever has been said then has been said first, because it

* But, even in medicine, is not the impression gradually becoming more general, that a physician educated solely according to German methods and in German schools, is, as a rule, somewhat more learned than wise—*doctior quam sapientior*—a little more of a doctor than a wise man?

was supposed to bear directly upon the question whether the cultivated classes were becoming near-sighted; and secondly, because of the importance of the comparison in determining the cause of the increase, and the best method of preventing it.

Before attempting to do this latter, even in the most cursory manner, I should like to refresh your mind as briefly as possible with the few leading facts which I have presented to you, and the conclusions which I should draw from them.

In the first place, I think we are safe in assuming, from the authority of so many who are competent to judge, that near-sightedness is hereditary, though the degree to which it is so has not been accurately determined; and secondly, that myopia is produced even where there is no hereditary tendency, by excessive application of the eyes in study, and that, other things being equal, the frequency is proportionate to the amount of application.

But, even with these admissions, are we in a position to declare, in the words of Ribot, with which we began these remarks, that, "since constant study creates myopia, and heredity most frequently perpetuates it, the number of short-sighted persons must *necessarily* increase in a nation devoted to intellectual pursuits." This question can, at least at the present time, be answered only conditionally, and that is, that, if by a nation devoted to intellectual pursuits, we mean that compulsory education shall be carried out in the full extent of its original meaning, and applied to every child that is born, be it male or female, then I think the answer should be in the affirmative, and if Germany is going to be taken as the type, and every other nation desirous of intellectual progress be compelled to follow her lead as an example, then I am of the opinion that not only the educated classes, as the term is commonly understood at present, but that the world at large will, in time, become near-sighted. We cannot, indeed, say that every man, woman, and child in Germany will eventually become myopic, simply because we have not as yet the necessary data to predicate such a conclusion with absolute certainty; but what we do know is that, at this moment, 62 per cent. and over of those who go through her public schools, start, at the very threshold

of life, with a condition of eyes which is usually equivalent to a disease, and one which, at any time, may not only impair the usefulness, but even lead to the destruction of one of the most important organs for man's welfare, and not only for his welfare, but for his existence.

We, as a nation, are at present more fortunate, and the fact just pointed out that the normal eye is the predominating eye by far, in every age of school life, is most encouraging, and would lead one to suppose that the anxiety which certain observers and writers have felt and expressed in regard to the future welfare of our eyes, as a nation, was uncalled for. And it certainly might be argued that, inasmuch as there are only three classes of all eyes, it would be natural to expect that, under the most favorable conditions, there would be at least $\frac{1}{3}$ or 33 per cent. of all eyes near-sighted, while, in fact, there are only 26 per cent. in this condition, even in the highest classes. This would be a natural division, and we could no more expect all eyes to be born of a certain length, than we could expect everybody to be of an exact height, or to have all their other organs of the same length and size, and especially true is this when we take into consideration that, strictly speaking, the length of a normal eye is a poetical condition seldom or never met, and is, indeed, a mathematical point, the slightest deviation from which would make an abnormal condition, that is, either a near-sighted or far-sighted eye.

It must, therefore, be admitted that at first sight the results gained from the American statistics as to the optical condition of our eyes, as a race, are very reassuring, but, on closer inspection, it is seen that the ratio of increase from the lowest to the highest is greater in the American than in the German, that is to say, the ratio of 3.5 per cent. to 26.5 per cent. is a little higher than 11 per cent. to 62 per cent. And the question arises at once whether, after all, the difference existing between the two nations is not rather one of degree than kind, and whether, if we adopt the same method of education, and exact the same application of the eyes, we shall not, in a few generations, reach, if not pass, the amount of near-sightedness which the German statistics now present.

It is, it seems to me, but a question of conditions, and it must be acknowledged that in some respects we certainly do resemble the Germans. Next to them, I believe that with the best market in the world, as a people, we have the worst cooking.

It is true that there has been latterly an immense improvement in this respect, but to this day, we have in the country towns, and largely too, in the cities, the fried beefsteak, the saleratus bread, the strumous pie, and the air-tight stove.

But, unlike the Germans, we have a fondness for out-door games, as passionate almost as the English, and which we carry on with an ever-increasing devotion in spite of the rigors of a winter which is almost arctic, and a summer which is truly torrid. Side by side, in our upper schools, at least for boys, are two classes, one that devotes itself principally, if not exclusively, to studious occupations, and one whose attention is turned chiefly, if not entirely, to athletic exercises; and if the truth were known, I believe the conviction is growing in the mind of the community, if not in that of the professors themselves, that as great a benefit is accruing, and will accrue to the race from the training in one class as the other.

Now, whether this devotion to athletic exercises, with its accompanying reduction in the amount of study performed by a considerable part of the community, together with a better understanding and enforcement of hygienic laws, will suffice to prevent an increase in the amount of near-sightedness, can only be told by future examinations made at long intervals. But my own belief is that we have in the example of other nations sufficient evidence to show the danger which threatens us, even if the evil is not actually upon us. Evidence which should open our eyes to the fact that the amount of school work consistent with a healthy condition of the eyes has not only reached its furthest possible limit, but in many places, far exceeds it; and that instead of waiting to see whether or not the amount of near-sightedness will increase, we should, while there is yet time, take every means of lessening the quantity which now exists. The only question is as to how this shall be done. It would be an-

swered at once, that as increased study produces myopia, the simplest way to reduce the amount, would be to reduce the work. As a physician, I should, of course, personally approve of such a plan, but I fear it would meet with a strong opposition, just where it would be the least expected, that is, from the parents of the children. Fortunately, this opposition is the less harmful, since I believe that the amount of myopia might be lessened without reducing the gross amount of application of the eyes, though it would materially change the time of life at which it was made.

This belief rests on a fact, which is, I think, the most important to which your attention could possibly be called in this connection. That is, that near-sightedness is essentially a disease of childhood, or at the latest, of adolescent life. Thus, Donders declares that he never has seen a case of myopia originate after the 20th year, and Prof. Erismann states that in his experience, it rarely, if ever, began after the 15th or 16th year.

It cannot be doubted that these statements are in the main correct, and in accordance with the experience of every observant oculist.

The great period for the development of myopia, that is, for its *beginning* is, from the 10th to the 15th year, just at the time when the body, as a whole, is developing most rapidly. The investing membrane of the eye, which is elastic at this period of life, yields to the pressure of the watery contents of the eyeball, which are increased by continued application, and the result is a lengthening of the eye, which, as I have so often explained to you, is near-sightedness. What is more, this distention will take place under an amount of application during the years of early youth, which, at a little later period, would not only produce no effect, but which might be increased many-fold with impunity. After the 18th or even 16th year, when the investing membrane of the eye has become firm, and unyielding, overstudy may produce other and graver diseases of the eye, but it will not produce near-sightedness. From this, it follows directly, that the simplest, indeed the only method of preventing an increase in near-sightedness, if the present high standard of instruction is to be preserved in force, is to lessen

the amount of work done by school children during the period of life from eight to sixteen years, and to restore the equilibrium, if necessary, by increasing the amount of study after that time, or better still, by increasing the period of time devoted to study. It is by complying with these conditions, whether consciously or unconsciously, that the English have become so eminently a literary people, and still, as a people, so free from myopia. While, on the other hand, it is the violation of these laws and their teachings, that is, by compelling the young of both sexes to undergo a large amount of study at a tender age, which has made Germany, without doubt, the shortest-sighted nation in the world.

I wished in this connection to refer to a matter upon which I touched in the earlier part of these remarks, and which, though deserving of a thorough consideration, I shall be obliged to pass over in the briefest possible way, as my paper has far outrun in length my expectation. I allude to the apparent contradiction of the fact that long continued work upon small objects produces near-sightedness, a fact shown, as alleged by the comparatively small amount of myopia among those who are engaged in mechanical callings in comparison with those who devote themselves to so-called intellectual pursuits. Of this fact, I think there can be no doubt, though the reasons for it have been but little dwelt upon nor have I time to do so at the present moment. But I will remark that I believe that the principal reason why the members of mechanical arts show less myopia than those of studious and literary occupations, is not because they use their eyes less, but that the application of the eyes occurs at a different time of life, and under entirely different surroundings, or conditions of existence. Until very recently, the early education of apprentices in skilled labor was, fortunately, I think, for them, neglected. They had but little school learning. They did not even approach the niceties of their calling until they were sixteen or seventeen years of age, and oftener not until they were grown men, and even then it was in the most gradual and careful manner. Moreover, the work was often interrupted, often be-
guiled by conversation, either connected with, or absolutely

remote from their labor. When the apprenticeship * was completed, and they came to close application of the eyes to near work, the dangerous period for the development of nearsightedness was over.

This is precisely the reverse of what takes place with the young student whose hardest tasks often come just at a time when he is least able to bear them. Whole books might be written upon this theme, but I must leave it with this meagre allusion. But, before doing so, I should like to say, for the sake of those who are fond of authority and statistics, that Donders declares that watchmakers who spend their entire day with the glass at their eye do not develop myopia or any tendency thereto. Emmert contradicted this assertion, and declared that his statistics showed that the percentage of myopic children in the watchmaking schools in Switzerland was as great as in the ordinary schools. Cohn objected to this, and showed by his statistics that, among practising watchmakers, there were only 10 per cent. near-sighted, so also with gold and silver smiths, and jewelers, while in the last years of school life he found 63 per cent. myopic. Gärtner found 81 per cent. of the theological students that he examined near-sighted.

The reason why Emmert found a larger percentage in the watchmaking schools than had other examiners among practising watchmakers is evidently, as Cohn remarks, because his examinations were upon young children who were made to use their eyes at a tender age for long periods of time upon small objects. So that Emmert's statistics are a complete corroboration of the fact that it is the age at which it is made, rather than the application itself, that produces the near-sightedness. Moreover, it cannot be doubted that cerebral activity when long continued, combined with close application, affects the eyes to a greater degree than close application without such activity. Mind acts on matter here to as great a degree, if not greater, than in other parts of the body.

* And now comes a Saturday Reviewer, who says that since the time of apprenticeship has been lessened, and more time devoted to schooling, the manual skill and dexterity of the British artisan is decreasing. Labor-saving machines, however, have, no doubt, something to do with this.

If now, in the light of what has just been laid down, the question was repeated, it might be answered, I think, with assurance, that there is no danger that the "cultivated classes" will become near-sighted, provided, that while devoting themselves to literary pursuits, they are willing to recognize and abide by the few simple laws which have just been dwelt upon. On the contrary, I think there is every reason to believe that, with a little care and caution during the short but important period of life just alluded to, the present standard, or normal eye, formed and perfected in the remotest past, may be continued indefinitely.

Two questions have presented themselves to my mind while making my investigations on near-sightedness in the public schools. One is, whether the word instruction is always synonymous with education; and the second is, whether, while we are reducing the number of the absolutely blind in our asylums by improved methods of operation and treatment, we are not, by overuse of the eyes at school, laying up a future evil which, though milder in form, will, from its very frequency, entail a greater and more lasting detriment upon the race.

TABLE FROM WHICH THE AMERICAN DIAGRAM (No. 1) WAS CALCULATED.

Schools.	Eyes.	Combined Result in %.			M. in % as to Ages.			
					Years.	E.	M.	H.
Primary,	410	{ E. 1,531			6-7	86.98 %	3.55 %	9.47 %
District,	497	{ M. 448			8-9	87.00 %	4.65 %	8.35 %
Normal,	1,358	{ H. 286			10-11	82.25 %	7.75 %	10.00 %
		<u>2,265</u>			12-13	74.5 %	11.0 %	14.5 %
		2,265			14-15	73.1 %	8.4 %	18.5 %
Primary,		{ E. M. H.			16-17	67.7 %	17.2 %	15.1 %
District,		{ 84.9 6.80 8.3 = 100 %			18-19	62.53 %	25.20 %	12.27 %
Normal,		{ 67.8 11.67 20.53 = 100 %			20-21	60.97 %	26.79 %	12.24 %
		{ 62.29 26.67 11.04 = 100 %						
Myopia as to Nationalities.		{ German 23.23 %			Vision according to Snellen.			
		{ American 19.35 %			1	$\frac{2}{3}$	$\frac{2}{4}$	$\frac{1}{5}$
		{ Irish 14.28 %			1.845	162	96	85
							41	10
								14
								12
Astigmatism.		{ M = 34			No. of Cones in %.			
		{ H = 15			{ E. M. H.			
		{ 49 = 2.17 %			{ 3.33 % 20.56 % 3.49			

8.

AN

INTRODUCTORY LECTURE

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AND

DISEASES OF THE EYE,

DELIVERED AT THE BIRMINGHAM ROYAL SCHOOL OF MEDICINE AND
SURGERY, OCTOBER 4, 1839.

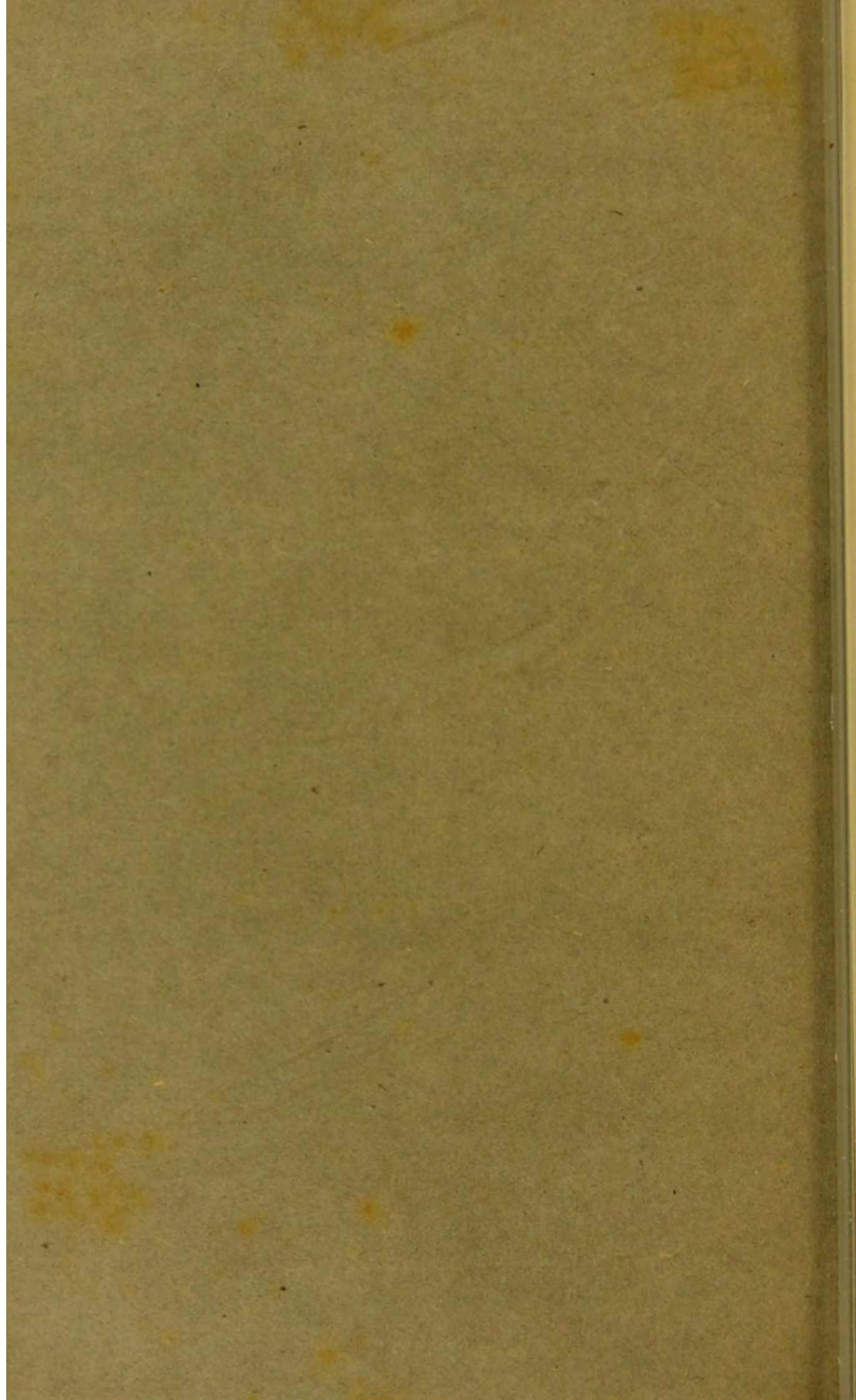
BY RICHARD MIDDLEMORE,

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[ENTERED AT STATIONERS' HALL.]

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TO
RICHARD MIDDLEMORE, ESQ.,
THE DAVIDS,
IN THE COUNTY OF WORCESTER;

AND
WILLIAM MIDDLEMORE, ESQ.,
EDGBASTON,
IN THE COUNTY OF WARWICK;

THIS INTRODUCTORY LECTURE IS INSCRIBED, WITH
SENTIMENTS OF RESPECT AND REGARD,

BY

THE AUTHOR.

RICHARD MIDDLEMORE, 1880

THE DAY

IN THE COURT OF RECORDS

WILLIAM MIDDLEMORE, 1881

THE DAY

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THE DAY

LECTURE.

GENTLEMEN,—Several years have elapsed since I first delivered Lectures on Diseases of the Eye to medical students in this town, and I well remember how strongly I was then impressed with the importance of the duty I had undertaken. Since that period, my best attention has been given to the same subject—my greater experience has made me, I may say, better acquainted with it—but still I cannot conceal from myself the fact, that, although by the good opinion of others I occupy my present position, it is one demanding qualifications of a far higher order than any to which I can lay claim. For, what have I engaged to do? Assuming your confidence in my capacity to communicate correct opinions on a subject of vast importance to you in your future medical career, I have, in the very act of accepting my present office, engaged to furnish you with that information which shall enable you to rescue from blindness numbers of your fellow beings—to impress you with views of disease and details of treatment which are to regulate and determine an important part of your future practice. If this duty be defectively performed—if erroneous views of disease and wrong principles of treatment be promulgated—the injury I shall do you will indeed be great; for, ignorance is preferable to error, and the mind is not readily disembarrassed of its early impressions. There is a certain confidence students are willing to repose in a lecturer—in the correctness of his views and opinions—in the truthfulness and fidelity of his statements—which becomes a source of immense injury

when misplaced, but which is of great benefit when really deserved. I ask, indeed I expect this confidence, but not in the degree in which it is often so promptly and generously accorded; for, without it, in some measure, I cannot lecture to you with any degree of satisfaction to myself or with much prospect of advantage to you.

Gentlemen,—Had I been an Oculist, or (to adopt a more pliant term) a Surgeon-Oculist, entirely confining my attention to the treatment of the maladies affecting the organ of vision, I am sure I should not have been requested to deliver the course of Lectures on Ophthalmic Surgery at this school, for, it is obvious, that however accurately I might have described many of the symptoms and the various *external characters* of disease, the treatment it would have been possible for me to suggest for their relief must, of necessity, have been based on narrow and erroneous principles. Perhaps, indeed, it is not going too far to assert, that he who limits his practice to the management of diseases of the eye, soon becomes incompetent to treat any of them but those of the slightest consequence. The practice of the mere Oculist has a tendency to separate the pathology of the eye from that of the system, to detach it from its natural associations, to invest it with a character of isolation, and, in this way, such practitioners, whatever they may have been at the outset of their career, gradually and almost imperceptibly acquire, and are guided by, rules of treatment and views of management, at once contracted, erroneous, and unphilosophical. In order to study diseases of the eye and their treatment in a right method,—in a method calculated to assist you in truly obtaining a full acquaintance with them and with their proper management, the pathology of the whole system must be laid under contribution;—the general principles of therapeutics must also be borne in mind. In the words of a distinguished

writer, "the whole field of medicine and surgery must be laid under contribution for the principles which are to guide us in learning the nature and treatment of ophthalmic disease." * If such be the case, what, you may inquire, is the object of that arrangement by which a separate course of lectures on the Diseases of the Eye is delivered at this school? I will endeavour to answer this question. In the first place, the division of great labour is at all times advantageous, and this is especially the case in regard to provincial medical instruction. The limited time which lecturers generally can devote to the arrangement of their views and opinions,—to the acquisition of information in a sufficiently precise and exact form for oral communication,—and to the minute description of the symptoms of disease,—render it almost impossible for any practitioner to lecture on a variety of subjects, requiring, for their due elucidation, great practical as well as other knowledge, with justice to himself and his hearers. I am sure you will come to this conclusion when you reflect on the time required to gain the necessary practical information,—to methodise this information,—to give to it a proper degree of exactitude and completeness,—and to communicate it with effect and precision. In the second place, it has been considered that I have paid a good deal of attention to diseases of the eye, and have been favoured with far more extensive opportunities of studying them than usually fall to the share of surgeons. However, I have no object of my own to serve, and, if an attention to these Lectures on Diseases of the Eye should appear to occupy too much of your time—if my arrangement of ophthalmic maladies should appear to be needlessly extended, and my description of symptoms

* *A Treatise on the Diseases of the Eye*, by W. LAWRENCE. London, 1833. Page 7.

unnecessarily minute, I shall, at the slightest hint, properly communicated, at once retire from my post. I must have space for the consideration of a class of maladies which I consider of vast consequence to the surgical student, and if this be denied me, I have, I repeat, no alternative but to retire, for I am not blessed with the art of condensing my observations on this extensive and important subject in one or two lectures of an hour's duration, and am naturally unwilling to adopt a practice which every conviction of my judgment tells me would be, in its results, to disgrace myself and to deceive you.

It may be doubted whether the affections of the eye afford matter for a separate course of lectures. In Germany, where diseases of the eye are far more attentively studied, and better and more extensively known than in this country, no doubt whatever is entertained on this point. "The extent of the subject," says Mr. LAWRENCE, "may be estimated from the circumstance that Professor BEER, of Vienna, occupied, in his course of instruction, ten months, giving five or six lectures weekly."*

But, Gentlemen, whatever may be my anxiety to assist your studies, unless you are thoroughly determined to apply to the subject with great zeal and diligence, unless you are prepared to renounce many of the prevailing customs of society (which so greatly tend to embarrass genius and encourage presuming ignorance), it will be wholly without effect. I call upon you then, at the outset, to be prepared to practice much of self-denial; to renounce many profitless pleasures and trifling amusements; and to consecrate yourselves to the service in which you have embarked with the most entire devotedness.

But let me not deceive you — I am supposing that in

* *Opus citatum.* Page 5.

engaging in the study of our interesting profession you are not actuated solely, nor indeed chiefly, by the motives which govern the strictly commercial part of the community in the exercise of their worldly calling, but by those elevated aspirations after usefulness, which have manifestly guided the conduct of many departed lights of medical science. It is delightful to dwell upon this subject—to record, even in this general manner, the services of men who have voluntarily renounced much of the emoluments of practice—the splendour of a fashionable position, with its much-courted but temporary honours, and its seducing but ephemeral respect—in order that they might possess themselves of that time which was necessary to enable them to record the results of their experience for the advantage of succeeding generations. It is, I say, delightful to dwell on such a subject, for it constitutes one of the brightest and holiest pages in the history of human conduct.

I have thus endeavoured to explain the grounds on which it has been considered advisable to establish, at this school, a Professorship of Ophthalmic Surgery; and it remains for me to endeavour, by my attention to the duties of my office, to justify that choice which has caused my appearance in this theatre to day.

Gentlemen,—The inflammatory diseases of the eye alone are exceedingly numerous; and I need scarcely tell you that, viewed in relation to their consequences, many of them are exceedingly important—more important indeed than are the frequent results of inflammation of other parts, whose functions are, nevertheless, essential to the persistence of life. For example, inflammation of the attached and loose portions of the pericardium may take place, and, through the medium of effused lymph, produce their agglutination, without, as a necessary consequence, impairing, in any but the slightest possible degree, the function of the vital organ that membrane

envelopes and contains ; but if the same thing occurs in many of the textures of the eye—for example, in the anterior hemisphere of the capsule of the lens—if inflammation of that delicate membrane take place, and give rise to opaque deposition, which eventually constitutes a medium of adhesion between it and the neighbouring membrane (the iris), which naturally floats in the aqueous humour, the function of the organ is, of necessity, much impaired and very often wholly destroyed.

It has always appeared to me, that the study of diseases of the eye is peculiarly interesting ; for, in consequence of the superficial situation of some of its textures, and the transparency of others, we have an opportunity of rendering many of its maladies objects of visual scrutiny—of, in fact, actually witnessing and distinctly seeing the morbid process. If any of the external textures of the eye, or any of those parts which may be seen through its transparent media, are diseased, we have an extremely favourable opportunity of discriminating, without the risk of error, the form and nature of such disease, of distinguishing its seat, and of determining the character and the qualities of its effects, by the aid of vision—by actually witnessing, not only its precise pathological state, but of observing the product of such morbid condition. I repeat, therefore, that, as far as this circumstance is concerned, it communicates an interest to the study of diseases of the eye which is not associated with the minute investigation of disease when situated in many other parts. But again, there are other diseases of the eye, and, indeed, some of its most important maladies, which cannot be so distinguished, in the investigation of which, indeed, a mere inspection of the diseased organ affords scarcely any useful information ; for they are not distinctly indicated by any outward and visible signs of morbid action, but, on the contrary, are very obscurely manifested by their various

symptoms on cursory examination and inquiry ; and, at the same time, are rapidly destructive in their progress ; yet, unless most promptly detected, they are exceedingly prone to obtain that degree of establishment which no applications — no method of treatment whatever — will beneficially influence.

The inflammatory affections of the conjunctiva are not generally of so much importance as are those of the deeper-seated textures, and the medical management they require is also of a much more simple character, and yet, in right of the conspicuousness of one of their chiefest symptoms (redness), they usually receive a much greater degree of attention, and far more accurate treatment. For instance : it has many times fallen to my lot to be consulted by persons suffering from chronic inflammation of the retina, which has proceeded so far as almost entirely to destroy vision. They tell me that the eyes were not much reddened or painful in the first instance, they watered and were somewhat intolerant of light ; that, after a time, the sight became dim, and the intolerance of light diminished ; that they then had recourse to spectacles, which scarcely at all improved vision, and that now they possess hardly any useful degree of sight. In other instances they inform me, that the medical gentleman they consulted, examined the eyes very slightly, and told them that their sight was getting weaker and that they required spectacles, which they accordingly procured, and with which they certainly did see better for a short time, which encouraged them to continue their use and to increase their power until all but total blindness ensued. Such is the history of many cases I have seen, and I ask you, what must be the feelings of that surgeon who, in connexion with an unfortunate case of this description, felt constrained by truth to say — “ This person, who is now condemned to blindness for life, consulted me when his complaint first appeared, and I

cannot deny, but that, owing to my ignorance and inattention, he is now for ever deprived of the blessing of sight." I furnish you with no fanciful or highly coloured illustration of an imaginary calamity; I tell you no more than that which I well know has frequently occurred. Here, then, is a case the nature of which no surgeon would be able to discriminate without much attention, without careful examination, and elaborate inquiry. The symptoms are neither urgent nor particularly manifest, and the defect, in the first instance, amounts merely to a trivial inconvenience; but I have told you the dreadful result of neglected or mistaken diagnosis, and of inefficient, delayed, or erroneous treatment.

There is a form of chronic inflammation of the lamellar texture of the cornea, which, without producing much pain, or occasioning much external redness, will continue until it gives rise to a serious degree of opacity. If a patient in this state consult a surgeon not pretty well acquainted with diseases of the eye, or one who examines the affected organ superficially, he will, in all probability, be directed to apply a solution of corrosive sublimate, or some other stimulating application to remove the opacity; and I need scarcely tell you that the probable consequence of this great error will be an aggravation of a most important inflammation, which will be very likely to terminate in the serious impairment or total loss of vision. A patient was brought to me from a distance last week, suffering from the most intense inflammation of the lamellar texture of the cornea I almost ever witnessed; in fact, the cornea looked like the ground glass of a reading lamp, except that it was much more opaque. In this case, the skin of the face, and especially of the eye-lids, was extensively stained with the nitrate of silver; a strong solution of which constituted the chief part of the treatment of this terrific disease.

I might continue this series of illustrations of the necessity,

on the part of the medical student, of paying great attention to diseases of the eye, but I hope those already given will sufficiently exhibit this important fact — a fact recommended to your attention, not merely by every view of interest and every motive of policy, but by the powerful call of humanity and the energetic appeal of conscience. And here I may inquire, is it right that a class of diseases so numerous, so important, so capable of illustrating general pathology, so intimately connected with various morbid conditions of the system, and, moreover, so calamitous in result, as are those of the eye, — is it right, I ask, that the study and management of this class of diseases, should be renounced by the profession and resigned to the wisdom of empirics? I am sure your convictions will at once incline you to answer in the negative, and to intimate your approval of any arrangement, by which a greater attention shall be secured to ophthalmology than that it has, as a general rule, hitherto received, at least in this country.

It will be explained to you that the organ of vision is composed of a great variety of membranes, similar, in their anatomical characters, to membranes which enter into the composition of other parts and organs of the body; of some textures (as the lens, the iris, and the cornea), which are not strictly analogous to any others with which we are acquainted, and of various secretions and humours. All these parts — these somewhat numerous and extremely different parts — are closely compacted together. Hence it happens, — that is, in right of the proximity of the membranes of the eye to each other, — hence it happens, that there is a great tendency to an extension of inflammation when it has commenced in any one of them; and, in consequence of the nature of their structure, they are liable to the same forms of inflammation, and, generally speaking, of disease, which take place in membranes of a like kind in other situations; and a know-

ledge of this analogy of structure and of disease furnishes the basis of that systematic mode of treating of the diseases of the eye which is now adopted, in contrast to that immethodical and incomplete mode of discussing the same subject employed in former times.

Now, in consequence of the number of parts entering into the composition of the eye—their varied nature and characters—the small space they occupy—their proximity to, and vascular communications with, each other,—and also the delicacy and, so to speak, minuteness of many of the visible symptoms of their respective diseases,—it requires, in order to arrive at an exact discrimination of the precise situation, the form, and the degree, of existing inflammation or other morbid affection, that these circumstances (that is, the visible symptoms of disease) be noted, in detail, by your lecturer, and described with the utmost minuteness and precision, with all the “helps and appliances” which other than verbal description can give. This is a part of my subject to which I have paid great attention,—deriving such knowledge as I possess, not from books, but obtaining my information from the opportunity and habit of closely observing disease; and I will explain to you the method I have adopted, with a view of enabling me to ascertain and delineate the visible external symptoms of those diseases with which it is my duty to endeavour to make you acquainted.

It has been my custom, at every convenient opportunity, *to watch cases from their commencement to their conclusion*;—I mean, to observe them at regular intervals two or three times a day, or more or less frequently, according to circumstances;—*to see them in all their stages*,—not only when disease has been limited to the part in which it began, but when it has extended to other textures; not merely when treatment has succeeded in accomplishing a cure, but also when, from a variety of circumstances, disorganization of

textures has taken place, and loss of vision has occurred. By this method I have endeavoured to make myself acquainted with the entire course of disease; with every probable and ascertainable association and extension of morbid action; and with every form and variety of result.

Again, in determining the visible external characters of any given form of disease, I have carefully noted them down in a great variety of cases; I have compared these appearances in a vast number of instances; and have in this manner determined, first, the more prominent and leading symptoms; and, secondly, the inferior or less conspicuous ones, and even those which are merely occasionally present.

I have taken cases at different periods, set my notes aside for a time, then compared them with a new series of cases of a like nature; and, if any material difference in result has occurred, the cause of this discrepancy has been thoroughly sifted. Having thus arrived at a definite result, it has been committed to paper; that is, my description of any given disease has been written out at length,—not merely the visible and external appearances, but all the other characters of the malady. I have then read with great attention the descriptions of others; and every point on which I have differed from any approved authority has been again investigated; and in this way I have furnished to myself the *best* opportunity of either confirming a right conclusion, or of correcting an erroneous one. In describing particular diseases, it has been my custom to select from any one case that single appearance which has been best marked, another case, not exhibiting such one symptom at all conspicuously, has furnished me with an opportunity of observing some other symptom very favourably, which was scarcely to be noticed in the previous case; and in this manner, by an aggregation of these more perfectly developed symptoms and appearances, I have been enabled to furnish the clearest

account of the distinguishing characters of the malady this course of investigation could supply. When giving, in detail, the symptoms of particular diseases, I shall still adhere to this method; at the same time explaining to you that you will find in nearly every case you may, after a time, be called upon to attend, some one or other of the characteristic symptoms of the particular malady from which your patient may be suffering more prominently marked than the rest.

Now, many of the diseases of the eye are strictly constitutional; such are those termed strumous, rheumatic, gouty, syphilitic,—and require for their cure the same general mode of treatment as that employed for the relief of such diseases when affecting other parts. How, then, can it be said that the mere oculist is adequate to conduct the management of diseases of the eye? I am, however, quite willing to admit, that some very respectable individuals who have rendered service to ophthalmic science, have *avowedly* limited their *practice* to the management of diseases of the eye. It may, however, be safely asserted, that by far the best works on diseases of the eye, and beyond comparison the most useful discoveries and material improvements in this department of knowledge, have emanated from those who studied ophthalmology as a part of, and in connexion with, their profession generally; and if you only refer to those authors of the present day who have especially distinguished themselves by their ophthalmological researches, you will not fail to collect the names of many individuals who, for general professional attainments, will command your profoundest respect and warmest admiration. I mention these facts chiefly for the purpose of proving, that a most ample and intimate knowledge of ophthalmic disease is not only compatible with the ordinary pursuits of our profession, but is also materially assisted by the attainment of that

information which none but the well-informed physician and thorough surgeon can be presumed to possess. I may, however, tell you, that an attempt has been made to insinuate that a good knowledge of diseases of the eye and a due acquaintance with the various other branches of our profession, were incompatible attainments—that the former can only be obtained at the expense of the latter; in other words, that a good ophthalmologist must necessarily be a bad surgeon.

It is true, the gentlemen who have made these statements have not mentioned the names of LAWRENCE, WARDROP, TRAVERS, SAMUEL COOPER, GUTHRIE, TYRRELL and MORGAN, with a view of substantiating them. They were doubtless unwilling (and we cannot sufficiently admire their considerate forbearance) to bring forward such unequivocal evidence of the truthfulness of their assertions; they were reluctant to trouble their readers with proof so complete as that afforded by the recorded services of these distinguished men, that their attention to diseases of the eye had prevented them from labouring with success in the other departments of surgery; and very prudently declined to state that the individuals of the present day who had most largely contributed to the improvement of ophthalmic science, had also most largely assisted to extend the boundaries of other departments of medical knowledge, and thus endeared their names to the profession, by services, the memory of which will be as imperishable as the science they adorn.

Gentlemen,—If I dwell upon this point longer than may be thought necessary, it is because I feel impressed with the conviction that no doctrine can be more pernicious—more thoroughly at variance with the establishment of a sound ophthalmology, than that which represents the propriety of confining the treatment of diseases of the eye to particular individuals, who have never practised, or who have ceased

to practise the other branches of their profession. It is to the prevalence of this false notion — this utterly absurd opinion — that ophthalmic science has made such tardy progress, and that one of the most interesting and important departments of our profession has been, in a great measure, forced into the hands of empirics. Many medical practitioners will continue to have, as indeed they always have had, at least with a section of the community, a sort of special celebrity ; they will be considered to have paid more attention to one subject than another — to understand better, and to treat with greater success, one disease, or one class of diseases, than another ; and, I submit, that nothing can be more unwise or unfair than to attempt to convert this opinion, on the part of the public, into a means of injury to the individuals respecting whom it may be entertained. The tendency and effect of such absurd and unjust conduct is so manifestly injurious to the interests of medical science, that I need not detain you by explaining them in detail.

I have said that, in by-gone days, the management of diseases of the eye was in a great measure confined, by popular consent, to a class of ignorant persons who styled themselves *oculists* ; but although this custom was very extensively prevalent, it was by no means universal. Here, for example, is a book, published for the second time, in 1622, namely, “ *A Treatise of one hundred and thirteene diseases of the eyes and eye-liddes.* By RICHARD BANISTER, Mr. in Chyrurgery, Oculist and Practitioner in Physicke.” And, as though he were unwilling to merge his general professional reputation in the mere character of an oculist, he says, in his preliminary address, “ Understand, courteous reader, that my speciall breeding hath been in the general skill of chirurgery.” It is impossible to draw any other conclusion from this and similar explanations which may be found in the works of many other writers of the same period,

than this: that there existed, even at that time, a strong conviction on the minds of the more respectable and better informed members of our profession of the absurdity, not to say impossibility, of wholly separating the practice of the various departments of surgical science, and of their sense of the impropriety of seeking practice by the adoption of imposing and attractive titles. It was an honourable and salutary feeling — a feeling which by no means obscurely evinced that they ardently cherished the character and dignity of their profession, and were unwilling to sanction any conduct or custom, which had, as they conceived, the slightest tendency to lower its respectability, impair its usefulness, or impede its advancement. The works of PARÉ,* BARBETTE,† WISEMAN,‡ ETTMULLER,§ PURMANNUS,|| BIDLOO,¶ MEAD,** PLATNER,†† HEISTER,‡‡ TURNER,§§ and many other distinguished physicians and surgeons of former times, sufficiently attest that they also possessed a practical acquaintance with ophthalmic maladies, and attended to them, in their day, in common with other diseases. However, as a general rule, the treatment of diseases of the eye was in the hands of empirics, the habits and manœuvres of whom are pretty well illustrated by the conduct of the TAYLORS, many of whom were formerly in great repute. The most distinguished of these, after having cured all the curable in this country,

* *The Works of that famous Chirurgeon, AMBROSE PAREY.* Translated by T. Johnson. London, 1649.

† *Opera Omnia.* Geneva, 1683.

‡ *Several Chirurgicall Treatises.* London, 1676.

§ *Opera Omnia Theoretica et Practica.* London, 1685.

|| *Chirurgia Curiosa.* London, 1706.

¶ *Opera Omnia Anatomico-Chirurgica.* Lugd. Batav., 1715.

** *Medical Works.* London, 1762.

†† *Institutiones Chirurgiæ Rationalis.* Venet., 1747.

‡‡ *Institutiones Chirurgiæ.* Amsterdam, 1739.

§§ *The Art of Surgery.* London, 1736.

according to his own account, travelled to the continent, and there maintained a splendid equipage. It is stated, that his carriage was drawn by four horses, very gaily caparisoned, and was attended by many outriders; the pannels of the carriage were painted over with eyes, to denote his profession, and he adopted as his motto, "*Qui visum dat, vitam dat.*" BANISTER explains, in his quaint and amusing manner, the practices of the "eye empirics" who flourished in his day. He says, "in the methodicall practice and cure of blind people, by couching of cataracts, our English oculists haue alwayes had an especiall care, according to arts, to couch them within doores, out of the open aire, to preuent further danger.

"Yet some of these mountebanks take their patients into open markets, and there for vaine-glories sake, make them see, hurting the patient, only to make the people wonder at their rare skill.

"Some others make scaffolds, on purpose to execute their skill vpon, as the French-men, and Irish-man did in the Strand, making a trumpet to be blowne, before they went about their work.

"But these were not long suffered to vse these lewd courses, before they were called before the company of the chirurgeons: being sharply reprooued, soone left the city, and their abusiu practice."

I will not detain you by stating, in detail, the mode in which the empiricism of the present day is manifested and supported; for, in order to do so, it would be necessary to relate acts of knavery and ignorance which would excite the incredulity of this enlightened audience. Though its form, its mode of manifestation, has varied, its spirit and essence are the same—the scaffold and the trumpet are only superseded by the hand-bill and the placard.

Such are the means which, in the nineteenth century, are

employed to deceive the ignorant and impose upon the unwary ; but these means alone would be insufficient to accomplish the object (except in the case of those who would appear to be remarkably willing to be so deceived) without other aid, and especially that afforded by newspaper advertisements, which, being heavily paid for, furnish, *sub rosa*, the reward for those seducing editorial notices—those brief but expressive paragraphs, in the construction of which the conductors of our newspaper press have acquired such an adroit facility.

I speak plainly, for the subject is one not admitting of doubt, and, at the same time, demanding the fullest exposure and the most emphatic condemnation. However, it may perhaps be supposed, by some mild and gentle apologists for human frailty, that the talented body of men of whom I am now speaking—so quick to appreciate the advantages of knowledge, and so prompt to diffuse the triumphs of science—to unmask imposition and hypocrisy under almost every guise—are absolutely unable to perceive the bare-faced knavery of empiricism, and to recognize its injurious influence upon the community, whose interests, in other respects, they so well understand. If you are willing to accept this apology, for what you will then term the mental blindness of the gentlemen in question, it will be superfluous to say anything respecting the peculiar effects of a golden soporific, or to remind you of our homely proverb which tells us, “there are none so blind as those who *will not see*.”

I quit this ungrateful subject, which is disgraceful to the age in which we live, but with the conviction that I even now perceive the dawn of better times, when, restrained by the more advanced intelligence of the community, and by the existence of a more elevated standard of morality, the proprietors and editors of the talented and respectable por-

tion of the public press will cease to receive the indecent advertisements of empirics, and to pollute their pages and prostitute their pens in such disgraceful service.

Gentlemen,—When I first began to arrange the materials for this lecture, I intended to furnish you with a sketch of the progress of ophthalmic science; but, as I traced it onwards, I found them so abundant that it was quite impossible to condense them, with any useful effect, into the necessary space. I therefore determined to occupy your time by pointing out the importance of paying a due share of attention to the diseases of the eye—by explaining the best mode of studying them—by displaying the ill effects of urging this department of practice into the hands of mere oculists—and finally, by drawing your attention to those works which appear to me best calculated to assist you in the prosecution of your ophthalmic studies.*

I have now a few words to say to you relative to the books it may be desirable to consult respecting the anatomy, physiology, and diseases of the eye.

The works on the anatomy of the eye which appear to me best adapted to the wants of the students attending these lectures, are those of TRAVERS,† JACOB,‡ DALRYMPLE,§ and LAWRENCE;|| and, as I know you will desire to learn my opinion respecting them, I shall give you a condensed

* Those students who are disposed to study very minutely the history of ophthalmology, may advantageously consult the following works:—HALLER's *Bibliotheca Chirurgica*; RICHTER's *Bibliotheca Chirurgica*; BEER's *Bibliotheca Ophthalmica*; WALLROTH's *Syntagma de Ophthalmologia veterum*; and LANGENBECK's *Bibliotheca Chirurgica*. If the perusal of these works does not supply sufficiently minute and complete information, it will, at least, unfold sources of knowledge adequate to satisfy the mind of the most diligent inquirer.

† *A Synopsis of the Diseases of the Eye*, London, 1824. Introductory Chapter.

‡ *The Cyclopædia of Anatomy and Physiology*. Article, "Eye."

§ *The Anatomy of the Human Eye*. London, 1834.

|| *A Treatise on the Diseases of the Eye*. London, 1833. Introduction.

account of their respective merits ; solely, I repeat, with a view to your instruction.

The account of the eye furnished by Mr. TRAVERS is, for the most part, correct, but it contains some statements which we now know to be inaccurate ; it is certainly not so exact as that supplied by subsequent writers, and is, moreover, mixed up with speculations which, however ingenious, are out of place, at least as far as the object now in view is concerned.

Dr. JACOB's description of the structure of the eye is very minute and elaborate ; in fact, his account of the anatomy of the eye is one of the best extant, but some of its excellences for the advanced reader are, in fact, objections as respects junior students, for the latter of whom it is not, for the following reasons, so well suited as that of Mr. LAWRENCE :—

1. The author has not sufficiently confined himself to his subject. 2. He has assumed as fixed and positive, some points of anatomy which are still *sub judice*. 3. His style is, moreover, redundant and discursive, which tends, at the same time, to obscure the author's meaning and weary the reader's patience.

I have some objections to urge against the valuable work of Mr. DALRYMPLE. The book is (I am now referring to its adaptation to junior students) needlessly enlarged by the introduction of many long quotations from the works of men who have ceased to be authorities on matters relative to the anatomy of the eye, and the reader is too often left to determine for himself amidst much conflicting testimony, the exact value due to the opinions of each writer—to determine, from the mass of evidence introduced, the real state of knowledge. You want, instead of this, to have placed before you in explicit language and in a condensed form, the present state of our knowledge respecting the anatomy of the eye ; and I am really unacquainted with any writer who has accomplished

this object better than Mr. LAWRENCE. When I first examined his book I was inclined to smile, on perceiving that he had ventured to give an account of the anatomy of the eye and its appendages in a few pages, but, on examining these pages with due attention, I found that he had really done this in a perfectly satisfactory manner. His details are full and accurate—his style clear and compact. He is brief, not by omitting anything it is important the student should know, but by an extraordinary talent for condensation; so that whilst on the one hand there is neither diffusion to weary nor irrelevancy to perplex, there is, on the other hand, neither obscurity to be explained nor omission to be supplied; and I feel justified in saying that the ophthalmic student can possess himself of no better guide to the anatomy of the organ of vision than that constituting a portion of the introduction to Mr. LAWRENCE's work on diseases of the eye.

After a time you may consult the works of ZINN* and SOEEMMERRING.† These two great publications are almost entirely confined to an anatomical account, and a delineation of the eye and its appendages, and for minuteness, fulness, and accuracy of description, and beauty and fidelity of pictorial representation, have never been surpassed. As mere specimens of art the engravings of SOEEMMERRING are truly wonderful, and it has rarely happened that the labour and skill of the anatomist have been so successfully supported by the perseverance and ingenuity of the artist. To these works I may add the sixteenth book of HALLER,‡ which contains an account of the anatomy of the eye, distinguished not less by the accuracy than the extent of its information, and constituting a proud monument of human labour and research—

* *Descriptio Anatomica Oculi Humani Iconibus Illustrata.* Gottingen, 1755.

† *Icones Oculi Humani.* Francfort, 1804.

‡ *Elementa Physiologiæ Corporis Humani. Tomus Quintus.* Lausanne, 1763.

the labour of an original mind and the research of a discriminating judgment. The tiny efforts of some boastful modern writers stand in amusing contrast to the gigantic labours of this modest and extraordinary man, whose life presented in delightful union, the sublimity of virtue and the majesty of intellect.

The work of PORTERFIELD,* the papers by PETIT,† various articles in that excellent work *Scriptores Ophthalmologici Minores*,‡ a paper by Dr. JACOB, in the twelfth volume of the *Medico-Chirurgical Transactions*, by Dr. PROUT, in the thirtieth volume of the *London Medical and Physical Journal*, and by WHARTON JONES, in the twenty-third volume of the *Medical Gazette*, are also entitled to special attention.

The physiology of the eye is treated of in systematic works on Physiology. I may, however, refer you, in addition to the works of HALLER§ and PORTERFIELD,|| to those of TRAVERS¶ and LAWRENCE,** and also to various articles in the *Cyclopædia of Anatomy and Physiology*.†† A part of the physiology of the eye relates to the science of optics, and you may wish to prosecute your researches on this point to an extent by no means indispensable to the practical surgeon. Should this be the case, I shall be very happy to assist your studies as far as I am able; but it would be manifestly out of place to enter at all fully upon this delightful and interesting subject on the present occasion.

I shall now, for a few moments, address to you a few

* *A Treatise on the Eye, &c.* Edinburgh, 1769.

† *Mémoires de l'Académie Royale des Sciences*, 1723, 1725, 1726.

‡ Leipsic, 1826. Edited by Justus Radius.

§ *Elementa Physiologiæ Corporis Humani.* Lausanne, 1763. Tomus Quintus.

|| *A Treatise on the Eye; the Manner and Phenomena of Vision.* Edinburgh, 1769.

¶ *A Synopsis of the Diseases of the Eye, with a Sketch of the Physiology of that Organ.* London, 1824.

** *A Treatise on the Diseases of the Eye.* London, 1833.

†† See articles "Eye," "Vision," and "Organ of Vision."

observations on the works of various writers on diseases of the eye.

Here are the works of WARE,* WENZEL,† and DEMOURS,‡ and I may mention to you that they are all open to the same objection—they are not only behind the present state of science, but are composed by men who practised almost, if not entirely, as oculists. Hence, as I have already explained, we can feel but little confidence in their statements respecting the causes and treatment of many ophthalmic maladies depending on particular states of health, or conditions of the constitution, however accurately they may have described all their visible external symptoms.

The work of the illustrious SCARPA,§ though formerly in great repute, is not adapted to junior students. He is not only behind the knowledge of the present day, but his system of therapeutics is essentially defective. In fact, he has laid an undue stress upon local remedies; many of which are, moreover, not only inefficient but extremely disgusting. However, he suggested many important improvements in the treatment of diseases of the eye, which will be noticed in the course of the lectures I am now engaged in delivering.

The work of WELLER,|| like those of BENEDICT,¶ SAUNDERS,** VETCH,†† and EDMONSTON,‡‡ and the more recent

* *Chirurgical Observations relative to the Eye.* London, 1798.

† *Manuel de l'Oculiste.* Paris, 1808.

‡ *Traité des Maladies des Yeux.* Paris, 1818.

§ *Practical Observations on the Principal Diseases of the Eyes.* With Notes. By JAMES BRIGGS. London, 1806. Or Translation. By J. B. F. Lévillé. Paris, 1807.

|| *A Manual of the Diseases of the Human Eye.* By Dr. CHARLES H. WELLER. Translated by GEORGE C. MONTEATH, M.D. Glasgow, 1821.

¶ *De Morbis Oculi Humani Inflammatoriis.* Leipsic, 1811.

** *A Treatise on some Practical Points relating to the Diseases of the Eye.* London, 1816.

†† *A Practical Treatise on the Diseases of the Eye.* London, 1820.

‡‡ *A Treatise on the Varieties and Consequences of Ophthalmia.* London, 1806.

one of SICHEL,* are incomplete as systems of ophthalmic surgery; but may, nevertheless, be referred to by the more advanced student on particular sections of our subject.

On the operative surgery of the eye you cannot do better than consult the work of Mr. GUTHRIE.† The information in this book is not only very elaborate, but extremely accurate; its value is, moreover, increased by the addition of many excellent engravings.

Mr. WARDROP's scientific work was first published in the year 1808,‡ and it is by far the best work of the kind which has yet appeared. It has the merit of having accomplished for the pathology of the eye everything the immortal work of ANDRAL has effected for general pathology, and you are as yet scarcely in a condition to appreciate the extent of your obligations to its talented author. In addition to its other merits, it is adorned with a series of beautiful engravings, which illustrate, in a very satisfactory manner, many of the morbid changes to which the organ of vision is liable. These engravings are not, indeed, so numerous as those connected with the work of DEMOURS, but they are far more accurate. It cannot be denied, however, that the subject is still incomplete, and that its further prosecution and more complete elucidation will abundantly repay, in reputation to the individual and usefulness to the profession, any labour the task may require.

Here is a work which has had a most extensive circulation—which is known and quoted in every country where medical science is cultivated.§ Were I to characterise it in respect to the circumstances under which it first appeared,

* *Traité de l'Ophthalmia*, &c. Paris, 1837.

† *Lectures on the Operative Surgery of the Eye*. London, 1830.

‡ *The Morbid Anatomy of the Human Eye*. London.

§ *A Synopsis of the Diseases of the Eye, and their Treatment*. By BENJAMIN TRAVERS, F.R.S. London, 1824.

I should adopt a tone of approval which might almost seem extravagant; but if I am to give an opinion of it as a guide for the students attending these lectures, I feel compelled to say, there are open to you more appropriate sources of information. It has, however, very deservedly the credit (and this must be a source of immense satisfaction to its excellent author) of having essentially contributed to diffuse among the profession an acquaintance with diseases of the eye.

The latest work on diseases of the eye is written by Mr. MORGAN, one of the surgeons to Guy's Hospital;* and I must confess it has disappointed the expectations I had formed of it prior to its publication. The known ability of its author, his ample means of observation, the attention he is reputed to have paid to the subject, and, I may add, the important public position he occupies, led me to expect, not merely a respectable work, but one which, in right of its merits, should take its place by the side of that written by Mr. LAWRENCE,—and higher praise than this cannot be accorded to any existing volume connected with ophthalmic pathology. The descriptions of disease as given in Mr. MORGAN's book are always meagre, but *not* always correct; and the treatment recommended for their relief is by no means fully stated, neither is it in by any means every instance appropriate. The plates which accompany the work constitute its chief value.

The recent works of M. STOEBER,† ROGNETTA,‡ and VELPEAU,§ which have been so favourably reviewed in the continental journals, appear to me open to all the objections now urged against that of Mr. MORGAN, but in a much less

* *Lectures on Diseases of the Eye.* London, 1839.

† *Manuel Pratique de l'Ophthalmologie.* Bruxelles, 1837.

‡ *Cours de l'Ophthalmologie, ou Traité Complet des Maladies de l'Œil.* Paris, 1839.

§ *Manuel Pratique des Maladies des Yeux.* Paris, 1840. Edited by G. JEAN-SELME.

degree. These are all, however, works of merit ; and, if you were forming a collection of books on diseases of the eye, they ought to constitute a part of it. But it is my present object to recommend to you only one or two works, which are, at the same time, systems of ophthalmic surgery and the best guides to your ophthalmic studies.

Here are the works of LAWRENCE,* MACKENZIE,† and COOPER,‡ and they are indeed real treasures. The work of Mr. LAWRENCE is unquestionably the best of the three ; his intimate acquaintance with every department of medical investigation, combined with his knowledge of foreign medical literature, give him advantages of no ordinary character, and no surgeon now living in any country has made a better use of them. His descriptions of disease are models of lucid accuracy and condensed completeness—neither obscured by extreme brevity, nor enfeebled by needless diffusion ; and it appears to me that they enable the student, as far as this can be accomplished, to dispense with models, engravings, and all similar helps to written descriptions of diseased appearances. I do not, of course, intend to disparage the comprehensive work of Mr. MACKENZIE, for its value is undoubted, and its merit too well established to be affected by my praise or censure, all I intend is, to state my honest conviction, after having attentively considered and compared the merits of the two, that the work of Mr. LAWRENCE is much the best ; furnishing not only the better guide to gentlemen engaged in practice, but also the better help to the attainment of ophthalmic knowledge by the student.§ In fact, it is difficult to do justice to this book,

* *A Treatise on the Diseases of the Eye.* London, 1833.

† *A Practical Treatise on the Diseases of the Eye.* London, 1830.

‡ *A Dictionary of Practical Surgery.* London, 1838. See " Amaurosis," " Cataract," " Ophthalmia," &c.

§ Since the present Lecture was delivered, I find that Messrs. LONGMANS have announced a third edition of Mr. MACKENZIE's work on the diseases of the

which scarcely more abounds in the positive evidences of profound learning and extensive research, than in the riches of individual experience. The articles on the eye in the last edition of COOPER's *Surgical Dictionary* are very correct and elaborate. They are, however, scarcely so well adapted to the wants of junior students as the works of LAWRENCE and MACKENZIE, inasmuch as their author, after having placed a variety of opinions before his reader, has sometimes left him to balance and determine their respective value. If, however, he occasionally leaves the student in doubt, he never leads him into error; and, it must be admitted, that the opinions of the authors brought forward are selected with great care and judgment; and that every material point of practical interest and importance has received the most attentive consideration.*

eye. This is as it should be, and indicates, on the part of the profession, an increasing desire to cultivate a knowledge of ophthalmic diseases. This circumstance does not, however, in any degree weaken my belief in the accuracy of the remarks then made.

* I cannot suffer the present opportunity to pass without offering my grateful thanks to the distinguished author of this truly invaluable work, for the information I have derived from his learned labours. In the course of conversation with various medical friends, I have sometimes heard this extraordinary production spoken of as though it were a mere compilation. This is certainly an error, involving great injustice to a man to whom surgical science is largely indebted. It appears to me that its originality is not inconsiderable, but that it is in a great measure concealed by its learning—by the comprehensiveness of its plan, the extent of its matter, and the elaborate fulness of its details. If, on questions of surgical practice, other men's opinions are given—dove-tailed and interwoven, as it were, in almost countless numbers in every page—Mr. COOPER's opinions are also supplied. In fact, had not SAMUEL COOPER been one of the most *honest* and *candid*, as he is certainly the most *learned*, he would have been considered one of the most *original* surgical writers of modern times. Perhaps, indeed, I am wrong in supposing that he is not generally so considered at the present period. Be this as it may, I am convinced that, in after times, the historian, engaged in recording the services of the former benefactors of surgical science, will deliver such an opinion; and, estimating the professional zeal and devotedness of the author by the value and magnitude of his labours, exclaim, with involuntary admiration, *Non sibi sed aliis vixit.*

I may as well mention that I have also published a work on the subject of ophthalmic maladies,* in which I have endeavoured to furnish to the student and practitioner a clear description of disease, with a pretty copious account of its appropriate treatment. The size, and consequent expensiveness, of my *Treatise* has much interfered with the amount of its circulation abroad, and this circumstance has furnished an opportunity of plagiarism to an amusing extent. So that, in reading some foreign journals, I have on more than one occasion, "done into English" what has appeared to me an entire *Section* of my own work. In fact, the *coincidence* of expression, arrangement, and view of the subject, has been *quite remarkable*. These little mistakes we shall presently correct.

I shall say very little respecting the articles on diseases of the eye in COPLAND'S *Medical Dictionary*†, and the *Cyclopædia of Surgery*,‡ as but few of them are at present published. As far, however, as they have hitherto gone they promise to maintain the character of the well-informed and, for the most part, distinguished individuals engaged in their production.

In addition to the preceding works the more advanced students may consult, with great advantage, those sections of the surgical works of WARNER,§ B. BELL,|| POTT,¶

* *A Treatise on the Diseases of the Eye, and its Appendages.* London, 1835.

† London, 1833. See "Amaurosis," "Ophthalmia," &c.

‡ Edited by W. B. Costello, M.D. London, 1837.—See also the articles relative to the Eye in the *Cyclopædia of Practical Medicine*. (London, 1833), the *American Cyclopædia of Practical Medicine and Surgery*, (Philadelphia, 1835,) the *Dictionnaire de Médecine et de Chirurgie Pratiques*, (Paris, 1834), and the Papers of JACOBSON, RICHTER, WALTHER, SCHMIDT, BAERENS, JAEGER, and HOSP, in the *Scriptores Ophthalmologici Minores*, (Leipsic, 1826).

§ *Cases in Surgery.* London, 1784.

|| *A System of Surgery.* Edinburgh, 1801, vol. 4.

¶ *The Chirurgical Works of PERCIVALL POTT, F.R.S.,* London, 1790. EARLE'S Edition.

SHARP,* HEY,† DESAULT,‡ PETIT,§ LARRY,|| and DUPUYTREN,¶ and various articles published in the German, French, and American journals, by LANGENBECK, GRAEFE, RUST, AMMON, WALTHER, MUELLER, GONDRET, BONEFONS, MAGENDIE, SERRES, CUNIER, JEANSELME, LISFRANC, CARON, CAFFE, BOURJOT, and HAYS, which have special reference to interesting points of ophthalmic practice.** To these may be added various papers by BARTON,†† WHARTON JONES,‡‡ TYRRELL,§§ and HUNT.||||

The works of BEER,¶¶ JUENGKEN,*** and ROSAS,††† are entitled to the most respectful attention; but, as few of my auditors are presumed to read the German language at all fluently, I shall content myself with referring them to those English works, where the opinions of these distinguished individuals may be found. The opinions of BEER are embodied in MONTEATH'S translation of WELLER,‡‡‡ and those of ROSAS and JUENGKEN are frequently quoted in the treatises of LAWRENCE, MACKENZIE, and MIDDLEMORE.

* *A Treatise on the Operations of Surgery.* London, 1769.

† *Practical Observations in Surgery.* London, 1810.

‡ *Œuvres Chirurgicales.* Paris, 1801.

§ *Traité des Maladies Chirurgicales.* Paris, 1790.

|| *Mémoires de Chirurgie militaire.* Paris, 1812.

¶ *Leçons orales de clinique Chirurgicale faites à l'Hôtel-Dieu.* Paris, 1832, et 1834.

** Many of these have been re-published in the earlier numbers of the *Encyclographie des Sciences Médicales.*

†† *London Medical Gazette*, vol. 5.

‡‡ *London Medical Gazette*, vol. 21.

§§ *Medico-Chirurgical Transactions*, vol. 21.

|||| *North of England Medical and Surgical Journal*, vol. 1.

¶¶ *Lehre von den Augenkrankheiten, als Leitfaden zu seiner öffentlichen Vorlesungen.*

*** *Lehre von den Augenkrankheiten.*

††† *Handbuch der Theoretischen und Praktischen Augen-heilkunde.*

‡‡‡ A much enlarged and improved edition of WELLER'S work was published at Berlin, in 1826. This, as far as I am aware, has not been translated.

Mr. COOPER, in his invaluable *Surgical Dictionary*, has also stated their opinions pretty fully on nearly every material point of ophthalmic practice.

Let me, however, before I conclude, beg of you to avoid the multitude of little trumpery ophthalmic manuals which have recently issued from the press, for it is worse than a waste of time to read them. I do not complain of them because the information they contain is meagre, but because it is inaccurate—not because it is not sufficiently copious fully to instruct, but because it is so badly selected as seriously to mislead. You may tell me that some of them have passed through nine or ten *editions*, whilst the work of Mr. LAWRENCE, which I have felt it my duty so strongly to recommend, has not reached a second. You must remember there is a great difference between a *good* book and what the publishers call a *selling* book; and you must also bear in mind that some of our large medical publishers can “urge the sale” of any trash. It is true the books so designated contain the essence of early decay, but still, they live long enough to answer their projector’s purpose and to encourage a new speculation of a like nature. So that this matter of “many editions,” though an apparently accurate test of the quality of a book is really a very uncertain guide to its actual value.

And now, Gentlemen, I have given you but a very meagre account of an exceedingly small portion of works connected with that department of medical science, it has become my duty to teach; in proof of which I may refer you to the *Literatura Medica Digesta sive Repertorium Medicinæ Practicæ Chirurgicæ atque rei Obstetricæ*, of the indefatigable PLOUQUET; to the *Elementa Physiologiæ*, and the *Bibliotheca Chirurgica* of the illustrious HALLER; the *Chirurgische Bibliothek* of RICHTER; and LANGENBECK’S *Neue Chirurgische Bibliothek*. The *Manual of Select Medical Biblio-*

graphy by Dr. FORBES; the *Introduction to Medical Literature* by the late Dr. YOUNG; and the list of references to works appended to the Ophthalmic articles in COOPER'S *Surgical Dictionary*, COPLAND'S *Medical Dictionary*, the *American Cyclopædia of Practical Medicine and Surgery*, and the *Dictionnaire de Médecine et de Chirurgie*, may be consulted for this purpose by those to whom the large and valuable works of HALLER, PLOUCQUET, RICHTER, and LANGENBECK, are inaccessible.

I have thus discharged, to the best of my ability, and as far as the limits of a lecture will permit, the somewhat ungracious task in which, in justice to you, I have felt myself bound to engage; and, if my honest and, as I think, temperate criticism should give offence to any one, I can only say that I have studied to act with fairness and impartiality, and that none of the opinions now expressed have been advanced except after the most deliberate consideration.

I have now only to explain the arrangement I intend to adopt in the delivery of my lectures. I shall first treat of the diseases of the individual membranes of the eye,—I shall then discuss the morbid affections of the humours of the eye,—I shall next lecture on the affections of the whole eyeball,—then of those of the cavity of the orbit,—and lastly, of the appendages of the eye—dividing them, as is usual, into the ocular and palpebral appendages. The anatomy and physiology of each part will be prefixed to the description of its diseases.

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