the sore increased in size by the successive ulceration of depending parts. The pain is great and the ulcer very irritable. Secondary symptoms follow rarely this variety of chancre, but from its gradual draughts upon the system the constitution is soon impoverished and the patient frequently sinks under colliquative diarrhoea, due to extensive ulceration of the colon. The causes which most contribute to produce this form of phagadema are youth, a lymphatic temperament, the depressing influence of cold and damp weather, also damp houses, bad food, or pre-existing organic disease, and a bad state of the digestive organs. I have observed that the antiplastic action of mercurials has a very great influence on its production. It is more common in women than in men.

The progress is sometimes slow, but the sore may put on various aspects, in consequence of the particular state of the constitution. In scrofulous patients the ulcer is longer stationary, and the complication of tubercular disease of the lungs is far from uncommon. In herpetic subjects the skin of the whole body is irritable, and particularly so in the neighbourhood of the chancre where herpes and eczema frequently appear.

Scorbutic subjects present at the same time hæmorrhagic stains of the skin or the gums, and the sore itself bleeds very freely, presenting at the same time a dark brown or even black color. In those patients, ulcers of the large intestine are decidedly the most formidable complication, and I am inclined to believe that many of those intestinal erosions have their origin in a hæmorrhagic state of the submucous cellular tissue of the intestine, leading to softening, and terminated by erosion.

The sore may also put on the cancerous appearance, when the base will become hard, the lancinating pains appear, the peculiar aspect of scirrhus encephaloid tumors shew itself, and the other signs of a cancerous diathesis become manifest.

PRACTICAL REMARKS

UPON INJURIES TO THE IRIS, AND ON ARTIFICIAL PUPIL.

By J. B. ESTLIN, F.L.S.

Read at the Anniversary Meeting of the Provincial Medical and Surgical Association, held at Leeds, August 3, 1843.

TO DR. STREETEN, ONE OF THE EDITORS OF THE
PROVINCIAL MEDICAL JOURNAL.

MY DEAR SIR,—The paper read at the late meeting, at Leeds, upon "Injuries to the Iris," &c., was intended for a *vivâ voce* communication, and is scarcely in a form appropriate to the pages of the Journal; still, as you were present at the reading of the "Remarks," and think they may interest some of our members who were not at Leeds, I cannot but cheerfully comply with your request to forward the copy to you for publication.

I am,

Yours faithfully,

J. B. ESTLIN.

Bristol, August 12, 1843.

From the multitude of books that issue every year from the medical press, and especially from the num-

ber and variety of periodicals devoted to medical literature, that are now in existence, it would be reasonable to infer that the profession had access to every valuable fact and theory that existed in the experience or the minds of the practitioners of our art; but I believe such a conclusion would be very deficient in truth. I am inclined to the opinion that we could well afford to substitute for much of our written law the oral traditions of our older practitioners, would they but allow their stores of information to be opened to us.

I can never look upon a collected number of medical men who have been in practice from ten to twenty years, without thinking what a mass of valuable knowledge exists among them, quite inaccessible to the most industrious student, with an unlimited range of medical libraries, and certain of going out of the world with its possessors! There is no individual among us who could not impart some useful facts and observations to his brethren, and in bearing my own portion of blameworthiness for not having communicated more freely of the little I may possess, I must share in the reasonable grounds of exculpation to be found in the full engagement of time during an active career of medical practice; a fear of appearing before the public unworthily—a shrinking from the chance of being numbered among those who contribute more words than ideas to the various repositories of science, and, perhaps, sometimes a too unfavorable appreciation of the value of what he may have the power of communicating.

These remarks have naturally arisen from reflecting upon such meetings as those of this Association, and are by no means intended as introductory to anything of importance that I have now to offer, but, as our meetings are very favorable opportunities for bringing forward practical remarks of too limited and too insignificant a kind to be deserving of a more durable medium of record, I am induced on the present occasion to request the attention of the members to a few practical observations upon injuries to the iris and artificial pupil.

Thirty years of experience in rather an extensive field of observation have strongly impressed upon my mind the remarkable power of the iris to bear injuries without destructive inflammation to that membrane, or to other textures of the eye. The highly vascular and nervous structure of the iris would lead to the expectation, *a priori*, that no injury could be inflicted upon it without giving rise to serious and disorganising inflammation, but I have seen almost every possible kind of violence done to it with no more important consequence than such as the direct mechanical injury, produced at the moment of the accident, has occasioned. These accidents consist of lacerations of this membrane, cuts, punctures, separation from its attachments, together with protrusion through wounds of the cornea and sclerótica, and through openings occasioned by perforating ulcers of the cornea, in nearly all of which herniæ of the iris, the prolapsed portion becomes united to the wounded part.

As a type of the sort of injury the iris will meet with without becoming seriously inflamed, I will state the following:—

A young man, while turning iron, was struck on the

right eye by a portion of the metal detached with violence from the lathe. The cornea was cut about the fifth of an inch in extent near the sclerotica, towards the outer canthus. The iris was lacerated, and some of it hung out of the wound. I removed the separated portion, which, when spread out, proved to be nearly half the iris. The patient walked to the dispensary, and continued to attend regularly as an out-patient. No inflammation supervened, the wound healed favorably, and his sight, though injured, was not destroyed, the lens not having been rendered opaque.

It is, however, solely for the purpose of making some practical remarks in reference to operations upon the iris, that I am desirous of drawing attention to the degree of injury this membrane is capable of sustaining, without the occurrence of serious inflammation.

In the extraction of the cataract, the greatest caution is exercised, ordinarily, by operation to avoid wounding the iris, and an insufficient section of the cornea has often been the consequence of extreme carefulness on this point. Mr. Guthrie has endeavored to mitigate the apprehensions of surgeons with respect to the ill effects of such accidents, and advises that a portion of the iris should be incised by the knife while passing through the anterior chamber, if the tendency of the iris to fold over the knife cannot be prevented but by withdrawing the instrument.

My own experience leads me to similar conclusions; simply incised wounds of the iris, or those where a small portion has been unavoidably cut off, I have never found to lengthen the period of recovery, to give rise to iritis, or to produce subsequent inconvenience.

It has lately occurred to me in extracting an opaque lens from the right eye by the section of the upper half of the cornea, to have had much difficulty in removing the lens, partly, probably, from an insufficient section (the inner laminae of the cornea having been less freely divided than the external ones), and partly, I imagine, from an adhesion of the capsule of the lens to the iris, for the pupil never freely dilated upon the application of belladonna, which I always employ previously to the operation of extraction. It was necessary to draw out the lens by forceps, and though care was taken not to include the iris within the forceps, a part of it followed the extraction of the cataract, and remained like a fine colored shred upon the globe of the eye. I removed this lacerated and detached portion with scissors, and perceiving, on examining the eye, that a separated band of iris was remaining in the anterior chamber, exactly in the axis of the natural pupil, I drew it out from the eye, so that, altogether, about one half of the iris was lost. The want of an accurate adjustment of the edges of the divided cornea from projection of a portion of the lacerated iris, and also probably of hyaloid membrane (as some vitreous humor escaped during this operation), caused a slow recovery, which was still farther prolonged by the additional irritation arising from an inversion of the lower tarsus which supervened; still (and this is the particular point to which I wish to direct attention), the injury to the iris has not been followed by any serious consequence; the remaining portion has been unattacked by inflammation, and though the eye is not likely to turn out a good one, useful vision is daily advancing.

In the protrusions of the iris which take place after the extraction of the cataract, and keep the divided cornea from uniting, I have found the practice safe and effectual to cut off the prominent portion.

When such protrusions occur in consequence of accidental wounds of the cornea, or when that tunic has been perforated by ulceration, the natural process of cure is, for lymph to be thrown out upon the surface of the exposed iris, and for a new membranous covering to form, approaching, after a time, to the hardness of cornea; the prolapsed portion gradually diminishes, the spot, where the opening was, becomes opaque, the iris adhering to it and occasioning distortion of the pupil. This process, however, is often very tedious when left to nature, and much inconvenience is experienced by the long continued weakness of the eye. In such cases the prolapsed iris, forming a little bag filled by the aqueous humor behind, acts as a mechanical obstacle to the healing of the cornea, and much suffering is spared the patient, and much progress in the cure effected, by puncturing the protruded iris with a cataract needle, or snipping it off with scissors; in either operation there is an immediate escape of the aqueous humor, the iris falls back within the wound of the cornea, and the hernia seldom recurs. I have never found any inflammation to follow this mode of proceeding.

The liberties that may be taken with the iris is a matter of great importance, with reference to the operations for artificial pupil. I am inclined to believe that many persons with extensive opacities on the cornea, especially in cases where suppurative ophthalmia has pre-existed, are condemned to perpetual blindness, to whom a valuable degree of vision might be given by the removal of the iris opposite any clear portion of cornea that may be left. In every case of the kind, where there is no useful sight, if any of the cornea is clear, and the eye be otherwise healthy, the operation ought to be tried; and I have been surprised to find with how small a portion of cornea remaining transparent, a person may have a degree of vision to some extent useful, and, in a great degree, a source of comfort to him. And in such cases I prefer the operation of tearing away a portion of the iris, and cutting it off. A small section is made in the cornea near to the clear portion, the iris drawn out with a hook or forceps, and as much cut off as is practicable. Care will be necessary in this operation to avoid injuring the crystalline capsule.

The following case will serve as an example of this operation:—

William Whitchurch, aged twenty, boatman. Both eyes were attacked with gonorrhoeal ophthalmia. The right cornea had sloughed before he applied for assistance; the left was deeply ulcerated, but, by long-continued treatment, perforation of the anterior chamber was prevented, and, on the termination of all inflammatory symptoms, the right eye had sunk, and the left cornea had a large opacity in its centre, leaving a small skin clear near to its union with the sclerotica. The upper border of the pupil could be faintly distinguished through the opacity, but belladonna did not dilate it materially. He saw light, and had just the power of following a person about, but was unable to guide himself. He was so urgent with me to have some attempt made to procure him a little

sight, that I made an opening into the anterior chamber on the temporal side of the cornea, passed a hook that was blunt, to avoid scratching the capsule of the lens, into the pupil, and dragged out as much of the iris as I could, and cut it off. The part removed proved to be a considerable segment of the iris, with a portion of the pupillary aperture. He walked to my house to have the operation performed, and walked back to his lodgings afterwards. No inflammation followed, and the sight he now has is so useful, that he is able to afford assistance in the passage-boat crossing the river Severn, near Bristol, and is capable of engaging in many little employments, not requiring acute sight, that help him to procure a livelihood.

These observations refer to wounds of the iris, such as cuts, punctures, and lacerations; contusions of that delicate membrane, and long-continued pressure behind it, as from a displaced lens, or from a portion of the lens, or any more foreign body in the anterior chamber, are usually followed by inflammation of the iris; and in cases of extraction, where the cataract has been forced out through an insufficient corneal section, the iritic attack that too commonly follows depends probably upon the injurious pressure made upon the iris.

I have remarked a circumstance of a very curious nature in reference to the pupil in cases where this aperture can be of little use if it exist in its customary position, near the centre of the iris. The fact has been presented to me under so many different forms, that I can have no doubt upon the subject, though I have not seen any intimation of the kind in writers on ophthalmic surgery. I am, therefore, desirous of suggesting the point to the attention of those medical men especially who have peculiar facilities of observing diseases of the eyes.

What I refer to is, *the efforts of Nature to form a pupil at that point of the eye where it will be most useful.* In examining eyes where central opacities of the cornea existed, I have been repeatedly struck with the appearance of the pupil, which I have observed to be of a long, narrow shape, as if the longitudinal fibres of the iris had been split for the purpose of producing an aperture exactly opposite the clear portion of cornea, so as to be in the most suitable part for distinct vision. I was inclined to attribute this to some accidental circumstance; and when it existed in persons in whom the opacity of the cornea was occasioned by external injury, I supposed it to depend upon the fortunate coincidence of a wound on that part of the iris at the time when the original injury was inflicted. But having remarked, with much interest, in operations for artificial pupil, that an aperture in the iris, made at some little distance from the clearest portion of cornea, will in time extend itself, so as to be exactly in the position I at first designed and wished it to be, I can have no doubt that occasionally, in other cases of opacity from disease, Nature endeavours to remedy the evil by a similar effort. I am so satisfied of this fact, as regards operations, as to have no hesitation in declaring it, under the hope that others may be able to verify it by their own observations.

The only further intrusion I mean to make upon the time of the meeting is to describe a mode of making an artificial pupil, which I have been in the

habit of practising in a particular class of cases for many years, and which is recommended by the facility with which it is executed, and its efficiency in accomplishing the object in view.

It is done with a small knife, used, I think, originally by Sir W. Adams, called an iris knife, and figured in the works of Mackenzie and others. By these authors it was used by being introduced behind the iris through the sclerotica, and then pushed through the iris into the anterior chamber.

I have been accustomed to use this little instrument differently, inserting it through the cornea, near the temporal canthus, close to the sclerotica, with the flat part of the blade towards the iris. The instrument being passed through the anterior chamber to its nasal extremity, the handle of the knife is turned a quarter of a circle, so as to bring its cutting edge against the iris, and it is then withdrawn by a quick movement, that depresses the point of the instrument upon the iris, so as to make a horizontal cut across that membrane.

I have found this mode of making an artificial pupil particularly successful in cases where the natural pupil has closed after extraction of the cataract. I have operated upon many persons so circumstanced, and have in an instant relieved all the disappointment of the patient and myself, at the apparent failure of an operation, in the result of which both were much interested. Of course a circular and handsome pupil cannot be ensured by this proceeding, though such will often be the result; but I am inclined to believe that those surgeons whose engagements have led them to deal much with cases of closed pupil, will be very thankful, as I am, to see a good hole in the iris, whatever its shape or size may be. I have seldom known any inflammation result from this method of dividing the fibres of the iris.

To one class of cases of fixed and nearly closed pupil, with cataract, this operation is peculiarly appropriate; indeed, more so than any other I am acquainted with. I have succeeded in giving very useful vision in such instances, where little hope of success had been entertained by other surgeons, or myself. I refer to those patients in whom chronic inflammation of the iris has accompanied the formation of cataract, where only a little pupillary aperture is left, and that of an irregular shape, the iris being apparently thinned, and its posterior surface glued down to the opaque crystalline capsule, often with portions of detached pigment tinging its surface, and the eye possessing so low a perception of light, as to excite much apprehension of the existence of amaurosis. (I would wish it to be clearly understood that in all the cases I am speaking of as fitted for operation, I presume that the patient is totally blind, for, while useful vision exists in one eye, I rarely advise any operation upon the other.)

In such hopeless cases, then, supposing all inflammation and headache long to have subsided, the operation I am describing is well worthy of trial. It is to be performed exactly as before detailed. The cataract behind is often solid, and affords a good resistance to the knife in cutting the fibres of the iris. It is uncertain what will be the effect of the sudden incision. I have sometimes by one cut divided the fibres of the iris, and displaced the cataract, so that a

clear pupil was instantly produced, and a sudden blaze of light let in upon the retina, quite astounding to the delighted patient. At other times a permanent aperture in the iris will be made, of sufficient extent to allow of a thorough view of the opacities behind the pupil, and to admit of future operations with the needle for their removal, either through the cornea or sclerotica. I lay claim to no credit for this operation, having seen Mr. Alexander perform it thirty years ago; but I am not aware of its being described in any works upon diseases of the eye, and, as I consider it a very valuable one, I am glad to avail myself of the opportunity this meeting affords of making it more generally known.

EXPERIMENTAL

AND

PRACTICAL RESEARCHES ON THE BLOOD.

(Second Series.)

By WILLIAM ADDISON, F.L.S., &c.,

[Abstract read at the Meeting of the Provincial Medical and Surgical Association, Leeds, August 3, 1843.]

After referring to the results obtained by the first series of his "Researches," published in the Transactions of the Association (Vol. XI), the author draws particular attention to the numerous *colorless corpuscles* readily detected in the minutest portion of blood drawn by a puncture from the skin, and *their increased abundance where any inflammatory or abnormal nutritive action is going on*; he also refers to the *fibrillation of the liquor sanguinis*.

From these facts, and from the results of numerous experiments, he has come to the conclusion that lymph and pus globules, and epithelial cells, originate from the *colorless blood corpuscles*, either by a conversion or transformation of the entire corpuscles into these objects, or by the growth of their molecules. It is impossible to frame any conception of the phenomena of nutrition and secretion in the higher orders of animals without supposing the *parietes of the capillary blood-vessels in those places where these processes are actually going on to partake in the necessary changes*.

The appearance of the vessels in the web of a frog's foot after irritation, and of those in the transparent membranes of the embryo, is adduced to show that the walls of the capillaries are formed of fibrous tissue enclosing colorless blood corpuscles, this tissue being subject to changes and alterations equally with other parts of the structure. The adhesion of the colorless blood corpuscles to the parietes of the capillaries, and the physical properties and microscopical structure of the buffy coat of the blood, indicate these corpuscles as the sources from which the fibrous walls of the secreting vessels are formed, the corpuscles forming fibrous tissue, or passing through it to form epithelial cells in subjection to the special law governing the function of the organ in which they are placed, the tissue and the secreting cell originating from a peculiar development of the same object. If the colorless blood corpuscles be hurried through their tissue stages by an abnormal or increased nutrition, they come under our observation as lymph, pus, or exudation corpuscles, being various in magnitude, and having various appearances, according to the nature

and function of the organ from which they are taken, the stages or progress of their development, and the chemical reaction of the fluid with which they are associated.

From these facts and observations the author of the paper deduces the following theory:—

Nutrition may be normal or abnormal.

In *normal nutrition* the colorless blood cells first adhere to the tissue which forms the periphery of the capillary blood channels, they then enter into and contribute to the compositions of the tissue, being subsequently evolved upon the nearest *free surface* * as epithelial cells.

In *abnormal nutrition* the colorless blood cells adhere to the tissue in much greater abundance; they pass through a tissue stage, in which the tissue is much less fibrous and coherent, and are at length evolved or thrown off on the nearest *free surface*,† as lymph, pus, exudation, or imperfect epithelial cells, the forms and magnitudes of these objects resulting from the degree in which the formative influence regulating the development of the tissue has been exerted upon them. In this theory the red corpuscles are not supposed to take any active share as regards the formation of the tissue, or of the epithelium or pus; but it is supposed that in *acute inflammation* they do so, thereby constituting a distinctive character between abnormal nutrition and true inflammatory action.

Without binding himself to this theory in the exact terms in which it is here expressed, and with liberty to modify it, should his future observations require, the author believes that it affords the best key or explanation yet offered for a variety of microscopical facts, and gives a *rationale* of the phenomena observed in the most extensive class of diseases. The following account of the phenomena, giving rise to the buffy coat of the blood, and to scarlet fever, is given to show the practical application of the foregoing theory:—

From various causes, the nutritive function, or, what amounts to the same thing, the process of secretion, from some one or more of the epithelial surfaces, is diminished or arrested, and the colorless blood corpuscles, therefore, accumulate in the circulating fluid, so that when a vein is opened a much larger amount of them than usual flow out, and, from the sudden change of temperature to which they are exposed, or from other causes, they become ruptured, and discharge their contents, which consists of liquor sanguinis and molecules. In a short time the liquor sanguinis rises to the surface, carrying or drawing with it not only the molecules with which it was associated, but likewise those colorless corpuscles which, having for a longer period resisted the changes to which they have been exposed, have preserved their integrity; it then fibrillates, and forms tissue in the same manner as it would have done within the living vessels, if the colorless corpuscles had been appropriated to the purposes of nutrition; hence the buffy coat has a relation to the lower and colored portion of the clot, similar to that which the capillary parietes have to the currents of blood flowing through them.

In *scarlet fever*, some peculiar cause affects the

* The interior of a follicle, crypt, or duct.

† The pyogenic membrane.