The state of the retina in one hundred cases of granular kidney / by Henry Eales.

MEDICAL OPHTHALMOSCOPY.*

In his introduction the author urges the routine use of the ophthalmoscope in all diseases in which abnormal changes in the fundus oculi are even occasionally met with—advice we fear too often neglected by physicians, and hence the cause of much valuable information being constantly lost; here he also shortly alludes to some ocular conditions which are congenital, and some which are of interest only to the ophthalmic surgeon. He also points out how errors in refraction may be ascertained, and very strongly advocates the constant use of the ophthalmoscope by the "Direct Method," not to the exclusion of the "Indirect Method;" but for full information on these points he refers his readers to ophthalmic surgeons, and their writings.

In the first part of the book he deals generally with the changes found in the fundus oculi, which are of general medical significance, commencing with the changes found in the retinal vessels, and under this head he says, "A vein underfilled may present an increased width" in consequence of want of contraction (atony), and flattening out, in this way he accounts for the large size of the veins as seen in anæmia, leucocythæmia and allied conditions.

Speaking of diminished size of the arteries, he believes that contraction from persistent spasm is one cause, and considers that this "is common in Bright's disease." This is of course entirely theory, and bearing in mind the difficulties of really determining beyond doubt whether the retinal artery is smaller than usual, in cases of moderate dimunition of size, and what is the cause of the

* "A Manual and Atlas of Medical Opthalmoscophy." W. R. Gowers, M.D., F.R.C.P. H. K. Lewis, London, 1879.

author recommends the subcutaneous division of the contracted fascia at various situations.

1. In the palm of the hand.
2. Near the web of the fingers.
3. At each of its lateral digital insertions.

Median incisions, it is thought better to avoid on account of the position of the flexor tendon. Extension is made of the freed digit immediately after the operation, by means of a splint, fixed either anteriorly or posteriorly, and this must be worn day and night for three weeks. At the expiration of this time the same should be applied only on retiring to rest. It is thought by this proceeding that a relapse but seldom takes place, and even if it should, another subcutaneous division can be recommended at an early date; "this contrasts very favourably with the relapsed cases after open wound" (a procedure recommended by Busch of Bonn) "which from the nature of the cicatricial contraction are incapable of further relief." Upon the adoption and practice of the various minutiæ described, Mr. Adams believes much of the success of operating in such instances depends. The second portion of the book is occupied with the subject of the obliteration of depressed and unsightly cicatrices in conspicuous positions. These may be rendered much less evident by throughly dividing, subcutaneously, all the deep adhesions of the cicatrix, and keeping the same raised for three days by means of a couple of hare lip needles, introduced at right angles to each other under the scar, thus inducing more or less inflammation. After the withdrawal of these needles, the cicatrix gradually falls, until level with the surrounding parts.

Four plates and fourteen minor engravings add to the value of a work which is both interesting and useful.

ORIGINAL COMMUNICATIONS.

THE STATE OF THE RETINA IN ONE HUNDRED CASES OF GRANULAR KIDNEY.

BY HENRY EALES, SURGEON TO THE BIRMINGHAM AND MIDLAND EYE HOSPITAL.

AMAUROSIS, or defect of vision, was first noticed in association with albuminuria in 1812, by Wells.* Since the introduction of the ophthalmoscope it has been divided into two different kinds: *First.*—That due to uræmic poisoning of the brain centres, or retina—or probably both; and in which no structural changes have been found in the eyes. *Second.*—That in which structural changes are found in the retina, and are the cause of amaurosis. *First noticed* post-mortem by Turck in 1850.† It is with this *second* form that I am now about to deal.

The ophthalmic changes have been more or less comprehensively described by different authors. Dr. Gowers, the most recent writer on this subject, in his work on medical ophthalmoscopy, published this year, sums up the changes as follows:—"The retinal disease presents certain elements which are variously combined in different cases. 1. *Difuse slight opacity* and swelling of the retina, due to œdema of its substance. 2. *White spots* and patches of various size and distribution, due for the most part to degenerative processes. 3. *Hæmorrhages.* 4. *Inflammation* of the intra-ocular end of the optic nerves. 5. *Subsidence*

* "Med. Chir. Trans." Vol. iii.

† "Zeitschrift der Weiner Aerzte."

of inflammatory changes may be attended with atrophy of the retina and nerve.

In most cases one or more of these changes predominate, especially in the early stage of the affection, and, according to the elements most conspicuous four types of disease may be distinguished. 1. The Degenerative. 2. The Hæmorrhagic. 3. The Inflammatory. 4. The Neuritic."

According to most authors, the degenerative is only a second stage of the inflammatory, which must precede it, and which is often followed by absorption, and in many cases atrophy; and hæmorrhages are found in all stages, especially the inflammatory and degenerative. This was the view entertained by Dr. Clifford Allbutt, in 1871.* *Neuritis*, often passing into neuro-retinitis, frequently precisely similar to that seen in cases of intracranial tumor, has been noticed by Brudenel Carter, and others; but Dr. Gowers seems to be the first to give it a prominent and decided place in association with Bright's disease. I have myself, (in the practice of others), seen this affection three times associated with cerebral symptoms, such as vertigo, headache, vomiting, and lead to the hasty diagnosis of cerebral tumour; the true nature of the affection only being suspected after the serious effects of the internal administration of mercury, both on the general health and the eyes of the patients, became obvious.

Other conditions, such as detached retina, embolism, (Voelckers), choroidal hæmorrhage, and atrophy, opacity of the vitreous, and degeneration of retinal arteries (Gowers, one case), have been seen. Dr. Gowers believes that contraction of the retinal arteries from spasm is common in Bright's disease, and he has reported several cases in the British Medical Journal, Dec. 9th, 1876.

* The Ophthalmoscope in Medicine. Page 426.

In speaking of the degenerative form he says, "It commences usually without signs of inflammation," and so differs from most preceding authors as to its invariable inflammatory origin. My own experience quite confirms this statement. All observers concur in stating that this affection, though found in all forms of renal affection, not even excepting the lardaceous, is most usually found in association with granular kidney, of which it is almost diagnostic. Most authors concur in stating that it is usually sufficiently characteristic to enable the observer to diagnose with tolerable certainty the existence of kidney disease with the ophthalmoscope unaided.

Microscopic Characters.—I need scarcely describe the microscopic changes seen in the hæmorrhagic, or the inflammatory deposits found in the retina, with, or without œdema; but a few remarks on the spots of degeneration and the state of the vessels is, I think, necessary. These (degenerative) spots have been found by all observers to consist of—

1. Circumscribed patches of granule cells, and oil globules, that is patches of fatty degeneration.
2. Thickened fibres of Müller containing oil globules.

It is these latter which give rise to the stellate, glistening spots found radiating around the macula lutea, and which are so characteristic of this affection. The first patches alluded to are found in the nerve fibre layer chiefly, but also in the deeper layers. The nerve fibres themselves are seen to be thickened and degenerated, and would seem to be often the source of these degeneration patches. "Occasionally the layer of rods and cones present remarkable thickening" (Gowers). In Dr. Gowers' work on medical ophthalmoscopy these changes are well described, and plates are added showing

the changes he has himself seen (microscopically) in the tissues in this affection.

The Vessels.—In addition to white lines along the vessels due to fibrosis of the outer coat, or to perivascular exudation and white patches of degeneration, aneurismal dilatation of the larger arteries were seen in one case by Dr. Gowers.

Microscopically the same author has found "an increase of the nuclei of the capillary wall," and "irregular dilatations," that is aneurisms in the capillaries.

Different observers disagree very materially as to the per centage of persons suffering from kidney disease in whom morbid changes are found in the eyes. Thus Leber, writing in Graefe and Saemisch's Handbook of Ophthalmology, states, (p. 585) that—

Friedreichs found impairment of sight in 13 per cent.
Lebert „ „ „ 20 „
Lecorché „ „ „ 21 „

while, Galezowski found retinitis albuminurica, 50 times in 150 cases, *i.e.*, in 33 per eent.; and Wagner in 9 per cent. Landouzy, on the other hand, thought the existence of retinal disease was invariable. We shall see from my own cases, that statements, founded on the state of the vision, are not reliable, and of little service as a basis for estimation. My own observations tend to confirm those of Galezowski, that we may expect to find retinal changes in about one in every three cases. Before going into the details of my cases, I would state that the chief object of the investigations which have led to, and are the basis of, this paper, was to fix more firmly and precisely the probable per centage of those cases in which retinal changes are found; on which point opinions appear to differ widely, and the material on which to form an opinion, is very scanty, and in most cases unreliable

I am indebted to Dr. Saundby, both for prompting

me to make these observations, and also for furnishing the cases on which they have been made; all of these patients have been sent to me by Dr. Saundby during the last 12 or 15 months from the General Hospital, after he had seen them, and made a diagnosis of granular kidney from their general symptoms; and I would take this opportunity of thanking him for the notes of their general condition, which he has furnished me with, and which have entailed the "lion's share" of the work falling upon him. All of these cases (except one) had the pupils dilated with atropine, and were examined by the "direct method" of illumination; because I have found by experience, that unless both these points are strictly adhered to, the more minute changes found in a large number of cases will certainly escape detection, and consequently the conclusions be erroneous. As regards the evidence on which the diagnosis of granular kidney was made, I would state that in 100 cases examined 94 had albumen in urine, varying from a trace to a copious amount, the rule being the presence only of a trace, while in nine cases only was it copious. In 57 cases the sp. gr. of the urine was noted, and it was found to vary from 1.001 to 1.025, a low sp. gr. being the rule.

In 3 cases only was it above 1.020; in 46 only was it below 1.015; while in 17 only was it below 1.005. In 12 cases, in which casts were looked for, they were found in every instance. Ninety-seven out of the 100 cases had polyuria, as evidenced by their getting up at night to make water, in some cases several times. In 85 cases the state of the heart and pulse were noted, and in 71 accentuation or reduplication of the sounds of the heart, or firm pulse, seemed to indicate high arterial tension, while in 22 cases excentric hypertrophy of

the heart was evidenced by a diffused impulse, or by the apex beat being displaced outwards and downwards to the sixth interspace. The large majority complained of symptoms of dyspepsia, such as nausea, vomiting, diarrhœa, constipation, and most suffered from headache, vertigo, palpitation, and general pains about the body, especially in the lumbar region. Cough and spitting too were common symptoms. The occupation seemed to have no relation to the condition, except, perhaps, it is noteworthy that four were house-painters. In 53 cases the state of the bowels was noted. In 31 they were open and often loose; in 22 they were costive; so that constipation would seem to have been the more unusual state. In 46 cases enquiries were made as to the state of their vision before the instillation of atropine drops, but the vision was not tested. In 28 of these cases complaints of bad sight were made, and in only six of these, that is a little more than one in five, could any obvious abnormal condition be discovered in the retina; while in 18 persons who stated that their sight was good, retinal changes, such as specks, were found in five, that is, nearly one in three.

These facts confirm the opinion just now expressed, that all statistics as to the per centage of cases of retinitis in albuminuria which are founded on statements of vision, are of little or no value, and also amply confirm the experience of all recent observers that retinal changes, even of considerable extent, are quite compatible with a good state of vision. This was well-shown in six cases in which I tested vision by means of type and lenses, in whom considerable changes were found in the retina, and yet, with dilated pupils, their vision was nearly normal. Two cases only were women. It is probable that in the large number, if not all, of

those complaining of "bad sight," optical defects were the cause of the complaint. In two cases only did myopia come under my notice.

I will now pass to the condition of the eyes in these 100 cases:—In 28 cases abnormal changes were found in the retina; in 12 of these changes were found in both eyes; in 16 changes were found in *one* eye only. This rather militates against the views generally expressed that changes are *almost invariably* found in both eyes simultaneously, and can be explained by assuming—1. That the affection often affects one eye before the other. 2. That the affection often gets well in one eye before the other. 3. That it is often uniocular, which is very improbable.

The two former views, especially the first, have generally been expressed by previous writers.

In the twelve cases in which changes were found in both eyes four had diffuse retinitis, with fibrinous patches and œdema, and also whitish glistening patches; one had diffuse retinitis in one eye, with only one hæmorrhage in the other eye; five had many whitish round patches of the atrophic kind; two had only a few white round patches of the atrophic kind.

In the 16 cases in which changes were found only in one eye: in 6, several white round patches (atrophic) were found; in 5 a few (one or two) spots only were found; in 1, a single hæmorrhage near the disc was found (recent); in 2 cases one or two *black* specks were found, associated in one case with white specks, the black in one case being in centre of white speck; in 1 case two large (about size of disc) round soft-edged whitish patches were found close to the disc in right eye; in left eyes striæ in lens—neither pupil fully dilated.

In one of the first six cases, *and in this case only*, two

ophthalmoscopic examinations were made, with an interval of about two months between them. At the first examination no ophthalmic changes were found; at the *second* examination several white specks were found in one eye, especially along the side of one branch of the retinal artery, but there was no evidence of inflammation of the retina.

In addition to the 28 cases in which retinal changes were found, in three cases the disc was abnormal; in one, the disc was abnormally pink (hyperæmic); in two, the disc was abnormally pale (atrophic), and had its margins blurred in both eyes.

Probably the case of hyperæmia was the first stage of an incipient neuritis, while the two cases of atrophy were probably secondary to, and caused by, preceding neuritis of a slight form. If this deduction be correct, we have evidence of neuritis three times—that is, in 100 cases 28 had retinal changes; 3 had changes in the disc; making 31 cases in which abnormal conditions of the retinæ or disc were found, against 33 per cent. (Galezowski).

Changes found in other tissues than retina and disc.—*Arteries.*—In only two cases did I fancy the retinal artery was slightly contracted and small, without the co-existence of other evidence of retinal disease; and in these two cases I could not feel quite sure that it was abnormal.

Choroid.—In two cases patches of atrophy of the choroid were found, but these were associated with extreme myopia in one case. In the other case, one small circumscribed round patch of atrophy was found in the choroid, near the *fovea centralis*, and was not associated with myopia.

Vitreous—was opaque in two cases (one myopia). In one most peculiar case, white, very glistening opacities

were found in the posterior part of the vitreous, so like those seen in the retina in this disease, that they were, on the first glance, thought to be in the retina.

Veins.—In seven cases fulness and tortuosity of the veins were noted associated in one case with specks in the retina. In five cases pulsation of the veins was noted.

Pupil.—In six cases it was noted that the pupil was not fully dilated, and was in some cases oval. In one case this was associated with fulness of the veins.

It is noteworthy that in 14 cases opacity of the lens existed—*double* and incipient in eleven cases; single in three cases—in no case sufficient to prevent fundus being seen. In two cases of opaque lens, specks were found in the retina; in one of the single cases, the other eye was disorganized; in another of the single cases, the other eye had opaque vitreous and myopia. In one case only, arcus senilis was noted.

If all these cases are divided according to their ages in decades, it will be seen that the largest number is between the ages of 55 and 65 years of age. In this decade, too, the largest per centage (43) of retinal changes is found, while, in the decades which precede it, and follow it, there is a falling off in the number of cases, and in the per centage of cases in which retinal changes are found.

Age of Patients.	No.	Retinal Changes.	Per Centage.
30 to 35	4	2	5 per cent.
35 ,, 45	22	5	25 ,,
45 ,, 55	27	5	18 ,,
55 ,, 65	35	15	43 ,,
65 ,, 75	12	3	25 ,,

The very rapid falling off of cases from 65 to 75 years of age, points to death in the previous decade as the cause, and also points to 55 to 65 as the age at which the evil effects of Bright's disease culminate. The very

great increase of retinal affection at this period, amply confirms the views of all previous writers that the retinal affection is the more marked, has the general disease advances, and is in most cases a fair indication of the gravity of the general condition of the patient.

The amount of albumen in the urine seems also to point to the same conclusion; increase in the albuminuria being accompanied with an increase in the per centage of retinal changes, as well as the general symptoms of the malady, for in seven cases in which the albumen was *copious*, retinal changes were found in five cases; four times in both eyes; once only in one eye.

Changes found—

Case 1. Diffuse retinitis, both eyes.
„ 2. Specks in both retinæ.
„ 3. „ „
„ 4. Atrophy of the optic nerves.
„ 5. Specks in the left eye only.

It is the experience of all previous observers that the character of the retinal affection is more severe the more copious is the amount of albumen in urine, in which stage it often passes into diffuse retinitis.

In 20 out of 28 cases in which the retina was affected, the changes were of the atrophic kind, and clearly show what is generally stated, that this is the most typical form of retinal affection. In five cases diffuse retinitis was found, and would appear to be the next most typical form of eye affection. In three only were any changes found in the disc. The appearance of hæmorrhage in two cases only may appear to contradict the statements of most previous writers as to its frequent occurrence; but when it is remembered that each of these cases (except one) was only seen once; and when it is also remembered that in most cases a hæmorrhage becomes decolorised and so

loses its characters, and is perhaps entirely removed from view in a few days, it will rather excite surprise that any were seen at all.

The state of the bowels seems to bear a very important relation to the eye affection. Ten times were specks found associated with costive bowels, while in five cases only were specks found associated with open bowels; although the bowels were open in 31 cases, against 22 in which they were costive; that is, nearly one in every two with costive bowels had specks, while only one in every six with open bowels had retinal affection.

CONCLUSIONS.—*Source of origin of the degenerative spots.* Whether the small spots have their origin in decolorised blood spots, as supposed by Virchow; or whether they arise from fatty degeneration of fibrinous effusions into the retina; or whether they arise from primary fatty degeneration of the retinal elements, I have no evidence of a conclusive kind to offer. I am inclined to think that all three of these sources of origin play a part in the production of the spots. From the fact that I have myself seen these spots appear in cases under my constant observation, without any previous signs of hæmorrhage or inflammatory action, I am inclined to think, that some of the spots certainly owe their origin to a primary degeneration of the retinal elements. Dr. Gowers writing on this point says:—"The degenerative changes have been ascribed to a tendency to fatty degeneration, which renal disease entails; but this scarcely explains their localisation in the retina. Some facts, however, seem to show that a careful recent microscopic examination of the nerve centres elsewhere, may reveal the occurrence of similar changes in them;" and he draws attention to the researches of Gull and Sutton, who

have shown "extensive increase in the supporting tissue of the nerve centres" in chronic Bright's disease.

The Hæmorrhages are no doubt the outcome of three factors.

1. Arterial, or capillary degeneration.
2. High arterial tension.
3. An altered state of the blood.

What is the relation between the retinal and the renal affection? On this point opinions differ very much. Dr. Gowers says, "we know little" on this point. Nettleship says, in his manual of diseases of the eye, only just published, "the nature of the connection is obscure; it is not caused by the cardiac hypertrophy." Dr. Dickinson, in his work on albuminuria says, "the evidence points with sureness to the conclusion that the retinal, like the arterial change, is not associated with any specific renal condition (now admitted by most), but is the issue, direct or indirect, of increased arterial tension, which loss of renal function in all shapes may entail;" but he goes on to state, that in all forms of renal affection a fibrotic process is frequently, if not necessarily, sooner or later developed; and he appears to attribute the rise in arterial tension to this process, thereby making it the common cause of the affection in almost all cases. He agrees, therefore, with most authors, in considering the retinal always to be a late concomitant of renal structural changes.

Leber (writing in Graefe and Saemisch's Handbook of ophthalmology) says, it is "due partly to the altered condition of the blood; the retention of excretory products and hydræmia produced by the loss of albumen, partly to hypertrophy of the left ventricle, and exalted pressure in the arterial system."

Dr. Gowers, though not speaking definitely, would appear to incline to the opinion that in many cases it

is only another evidence of the tendency of the tissues to undergo fatty degeneration.

We know that, First,—Retinal changes are found in all forms of kidney affection; not even excepting cases of acute nephritis; and Second,—that purging causes a marked improvement in the retinal affection; Third,—the great increase in the per centage of retinal changes in my own cases, in which the bowels were costive; and Lastly,—that in fourteen cases of young men, whose ages ranged from 11 to 28 years, suffering from temporary functional albuminuria, and in whom there was no reason to suspect structural changes in the kidney, I found retinal changes in five cases, that is, in more than 33 per cent., and of the same character as in the older cases, namely, specks in four cases, and white fibrinous patches in one case. This seems to me fairly conclusive evidence that these changes are chiefly due to an altered state of the blood, in consequence of the kidney not performing its excretory function properly, though, no doubt, cardiac hypertrophy, arterial degeneration and high arterial tension, are accessory factors.

The fact that cardiac hypertrophy, and high arterial tension, often exist without kidney affection, and that in these cases hæmorrhages are not uncommon in the retina, while the typical appearances of retinitis albuminurica are absent, in my opinion, tends to confirm this view.

The fact also that many observers have noticed precisely similar appearances in the retina, which are probably anatomically identical, in other general blood diseases, such as pernicious anæmia, leucocythæmia, and diabetes, to my mind, also points to the state of the blood as the chief cause of this retinal affection.

Dr. Clifford Allbutt, in alluding to the fact that Galezowski and others had recorded appearances identical with retinitis albuminurica in diabetes, says,

in his work on the ophthalmoscope, page 253, "Albumen might perhaps have been found in these cases had not the presence of sugar prematurely satisfied the analyst." This statement is, I think, only evidence of the tendency of the best of us to lay down absolute laws, and refuse to accept any data which are not in accord with our own preconceived opinions. The most typical appearances of retinitis albuminurica, glistening white specks around the macula lutea, which I have ever seen, occurred in a case which not long since came under my care at the Eye Hospital in a man about 50 years of age, in whom, on following my invariable rule in these cases of examining the urine for albumen, I found none. This fact was subsequently confirmed by Dr. Saundby. On taking the sp. gr., I was astonished to find it very high, (1.034.) It then occurred to me that sugar might be present, and on examination with Fehling's solution, I obtained evidence of considerable quantities of sugar.

Before leaving this point, I would say that local inflammatory changes also seem to produce degeneration of the fibres of Muller, and all the most typical appearances of retinitis albuminurica in some cases Thus one of the most remarkable cases, in which I have seen retinitis albuminurica imitated, was a case of neuro-retinitis subsiding, with glistening white specks, in which all the general symptoms pointed with tolerable. sureness to the existence of cerebral tumour as the cause. At my advice the man went to the General Hospital, and there died after a few weeks; and, *post-mortem*, a large sarcoma, the size of an orange, was found occupying the upper part of the right cerebral hemisphere. The specimen was shown, at one of the Medical Societies in this town.* Precisely similar cases have been

* British Medical Journal, 1876, vol. ii., p. 709.

recorded by others. Thus Dr. Hughlings Jackson in Moorfield's Reports, vol. viii., part 3, May, 1876, says—

"In some cases I find with optic neuritis (I now speak of cases in which *post-mortem* examination reveals intra-cranial tumour) changes in the retina, very like, sometimes quite like, those occurring in Bright's disease."

Dr. Herm. Schmitch, S. Wegner,* Brudenell Carter,† and others, have reported similar cases.

Neuritic form.—Dr. Gowers in speaking of the pathological connection of this form of disease with albuminuria says, "In several cases in which I have found neuritis predominating, symptoms of cerebral disturbance were conspicuous." The three cases before alluded to, in which I have seen this affection under treatment, confirm this statement. Further on Dr. Gowers says, "It seems probable that in these cases there is much cerebral disturbance, and that this may determine the occurrence of the excessive change in the optic nerve." On this point I have no evidence to offer, and am inclined to consider Dr. Gowers' suggestion as important. So far as my researches go, medical literature throws little or no light on the cause of the neuritic form of eye affection in Bright's disease; but Dr. Gowers has collected material which tends to show that optic neuritis is more often associated with, and apparently due to, microscopical changes in the brain, than most previous writers have led us to believe.

These facts being admitted, still the fact remains, that in albuminuria a peculiar affection of the retina is often present, probably in about one in three cases; that it is almost peculiar to this affection, and is most common in the granular kidney, of which it is in

* Archiv. f. Oph., Bd., xv. Abth. iii., s, 253, 279.

† Diseases of the Eye. p., 426.

most cases suggestive; and that it is more common, and more pronounced the more advanced is the kidney affection; and is *usually* an evidence of advanced general disease, and, therefore, probably of degeneration of the kidney. We may grant all this, and still retain the view that it is not absolutely secondary to, and caused by, renal degeneration; indeed, if we admit with many that functional disturbance of the internal organs, especially the liver, may persist for many years, and load the blood with abnormal products which the kidney cannot, even in health, remove, we may then assume that both the eye and the kidney affection, are rather the outcome of a common cause, than that either is caused by structural changes in the other. This view was expressed by Mr. Brudenell Carter, when taking part in the discussion upon Gull and Sutton's paper on capillary fibrosis.

As to the question of cure in these cases. All the authors I have consulted admit that a partial, or complete cure is possible; though most seem to consider this exceptional, except in cases occurring during pregnancy. This is I think due to the fact, that most that has been written on this subject has been written by ophthalmic surgeons, who, by reason of their calling, only get those cases in which sight is affected—that is, the most advanced and severe cases. Indeed, judging from my own experience at the Eye Hospital, I should say that most of the cases which apply to ophthalmic institutions are affected with the most advanced form of the atrophic kind in which glistening white spots radiating around the fovea centralis, due to degeneration of Muller's fibres, are present, and occasionally we get a case of diffuse retinitis. From my own experience I should say that spots radiating around the macula lutea, and probaly due to degenerated fibres of

Muller, seldom, if ever, disappear; but the others I have seen to appear and disappear when under constant observation.

Once admitting the possibility of recovery, I think the fact that 28 cases of retinal disease can be collected from the practice of one physician at the General Hospital in twelve months, while only about four cases apply at the Eye Hospital annually out of 11,000 new cases suffering from all kinds of eye affections, is strong presumptive evidence that in the majority of these cases the changes are not progressive but temporary, due to exposure to cold, costive bowels, etc., and pass off again with the other temporary effects of these causes. The fact that I have seen these changes, in the cases of temporary albuminuria above alluded to, points to the same conclusion.

Other Changes.—Possibly in one of the two cases of choroidal atrophy, choroidal hæmorrhage, caused by the Bright's disease, was the cause in the absence of other conditions to account for it. One was due to myopia.

One of the two cases of opacity of the vitreous was, I think, due to Bright's disease.

Fulness of the Veins.—This was seen in seven cases, it might be an evidence of a tendency to hyperæmia and changes in the retina, but is, I think, more probably of a passive kind.

Pulsation—in the veins is, I think, not pathological.

The cases of non-dilatable pupil would seem to indicate vascular degeneration in the iris, often seen in old people, and not specially connected with Bright's disease.

The occurrence of opacity of the lens in 14 cases is interesting to ophthalmic surgeons, especially when it is remembered that spots in the retina were found in

two cases, because granular kidney seems to be connected specially with a tendency to suppuration after operation.

I have recently seen embolism of the retinal artery in a young anæmic girl with albuminuria; whether the connection is accidental or important in causation I cannot say, but Voelckers has three times noted this association.

I have recently seen a case of neuro-retinitis with arterial degeneration and thickening, or perivascular exudation and degeneration, similar to that seen by Dr. Gowers; but the case was not my own, and I do not know if it was associated with albuminuria. I have not seen this condition in any of the 100 cases reported on.

Arterial Contraction—without retinal disease, associated with hard pulse, and high arterial tension. I cannot confirm the statement of Dr. Gowers, that this is common. Only twice I think some slight contraction existed, but I did not feel sure that it was abnormal even in these cases.

I have recently had a case of diffuse hæmorrhage into the retina; the hæmorrhages have cleared; the retina looks quite healthy, but vision is imperfect, and the arteries have now contracted very much since I first saw the case. Here, though no sign of disease is visible, I think we may safely infer that the retina is damaged, and that the contraction is a consequence of degeneration in the retina, as it was not noticeable in the early stage of this case, and contraction of the retinal arteries from this cause is common.

I have looked over the cases on which Dr. Gowers bases his statement, and I find that in two cases only out of 10 in which contraction was noted, the retina was absolutely free from disease; hæmorrhages or patches being present in six cases; in two cases the pulse was soft, and the retinal artery not contracted.

I think, therefore, we cannot at present consider this point to be proved. I cannot confirm it by observation, though I have tried to do so; moreover, contraction, if local, is of no significance, and as we have seen in nearly all Dr. Gowers' cases a local cause was present.

A CASE OF EXANTHEMATIC CIRRHOSIS OF THE OVARY:

RESULTING IN MENSTRUAL EPILEPSY, AND CURED BY OOPHORECTOMY.

BY LAWSON TAIT, F.R.C.S.

IT has long been known that in certain zymotic diseases, especially in mumps and scarlet fever, male children are apt to suffer from orchitis, and I remember seeing a statement somewhere that such inflammation of the testicle was likely to be followed by atrophy and loss of its function. I cannot, however, verify my recollection by producing the reference.

In 1870 and 1871, and still more in 1874, my attention was drawn to the occurrence of acute pelvic peritonitis in women after attacks of scarlet fever and small-pox, these attacks leaving indications which shewed clearly that the mischief began in the ovaries. Accident enabled me to trace the subsequent history of two such cases, and I found that in both the menstruation became greatly diminished in amount, that it was accompanied by severe dysmenorrhœal symptoms, and that in one of the cases it entirely disappeared. From these cases, I began to suspect that the attacks were primarily due to inflammation of the ovary, and that this had some kind of relation to the zymotic diseases which preceded it.