LECTURES AND DEMONSTRATIONS.

Lectures: "Renal Disease" Tuesdays, October 18 to December 13, at 4 p.m. sharp. *Medical Society of London*. Free to Members of the Fellowship. Fee to non-Members, £1 1s. the series, or 5s. per lecture.

Demonstrations: "Clinical Pathology," by Dr. A. Knyvett Gordon, 10, Bedford Square, W.C.1., at 8.30 p.m. on Wednesdays, as follows: October 26, "Anæmia"; November 2, "Hæmorrhage"; November 9, "Splenic Enlargement." Fee £1 1s., or 10s. 6d. per demonstration. (Specially suitable for M.R.C.P. candidates.)

"Fundus Oculi," by Mr. R. Lindsay Rea, *West End Hospital for Nervous Diseases*, I.P. Dept., at 8.30 p.m. on Tuesday, November 22. Fee 10s. 6d. (Specially suitable for M.R.C.P. candidates.)

Anæsthetics: Practical tuition for a fortnight or a month can be arranged. Limited to two post-graduates at a time.

Obstetrics: "Uterine Infections in Obstetrics and Gynæcology." A course of practical instruction is given each week at *St. Mary Abbots Hospital*. Limited to four post-graduates at a time. Fee £1 5s.

Clinical Assistantships: Two clinical assistants per calendar month (men only) will be appointed at the *Lambeth Hospital*. Daily attendance 10—1 and 2—5. Fee £5 5s. per head.

Application for further particulars must be made to the Fellowship of Medicine, through whom arrangements are made.

Medical.**MIGRAINE.¹**

BY LIEUT.-COL. R. H. ELLIOT, D.Sc., M.D., F.R.C.S.

THERE is a prevalent idea that attacks of migraine show a very definite and almost clockwork periodicity. This is not borne out by these 300 cases. It is true that in a percentage of them the attacks recur with a certain amount of regularity and that the patient can state roughly that they come on once in so many days, weeks or months. Once in fourteen days is a period not infrequently quoted. The same is true of once in three weeks, or once a month, and menstruation appears to have a definite influence in a certain number of women. A few patients speak of daily attacks. In others they occur twice a year or at some such infrequent periods. Still others have had very few attacks in the course of a lifetime. Apart from all this, the interval between attacks undoubtedly varies widely in the same patient at different periods of life. The advance of presbyopia; the debilitating influence of disease, wounds and injuries; the depressing effect of sorrow, anxiety and worry; all these play an important part in predisposing the patient to attacks of migraine. The influence of age will be dealt with under a separate section.

¹ Being the second of a series of three lectures delivered at the Medical Society of London, under the auspices of the Fellowship of Medicine.

As to the duration of the attacks : This varies greatly. A patient may suffer from typical migraine with zigzags and hemianopia and yet may recover in from half to three-quarters of an hour, a very rare event. Much more frequently the duration varies from one to three days, and in one severe case eight days. The close of a migraine attack may be almost sudden, with immense relief to the sufferer. Not infrequently it dies down, allowing the patient to sleep, and he then wakes the next morning, often practically well. On the other hand, eight patients complained that when the headache passed off they felt battered and worn out. One, who had been a boxer, described his sensations as reminiscent of his recovery from a knock-out blow in the ring. A very recent patient stated that after an attack lasting three days it took her another three days to recover, and that in the interval she felt so ill that she could not afterwards remember clearly what happened.

It is not every patient who can give one a clear account of his symptoms, but two things are obvious : (1) That in many cases the course of the attack seems habitually to vary ; and (2) that even when the attack is regular as a rule, considerable differences may, none the less, be met with from time to time. There are, however, not a few cases in which the patient knows from the start almost exactly the course an attack will follow. It was so in 76 cases out of 300 (25·33 per cent.). This does not mean that the course is the same in different individuals. On the contrary, like everything else in connection with migraine, it varies to an extraordinary degree, but the constancy in the same individual is a very striking feature. The following samples, all by good observers, may be of interest. (1) A very able medical man, aged 45. Course of attack : Sweating on left side of the head ; a characteristic indefinable smell ; anuria ; increase of appetite ; surface chilliness ; gooseflesh on the left side ; pain begins in the left eye ; suspension of gastro-intestinal peristalsis ; polyuria ; left hemicrania ; hemianopia ; blotting out of portions of central field ; intense headache for exactly twelve hours ; sudden relief. His headaches were cured by glasses. Two years later they returned with the addition of blue zigzags towards the end of the attack and absolute occlusion of the left nostril during the attack ; sudden relief, leaving slight paresis of the left side of the tongue with blurred speech. A change in his glasses again helped him greatly. (2) A medical man, aged 50. Feels extraordinarily well the day before ; wakes with a sense of heaviness on one side of the head ; then vision fails, either in patches or completely ; anuria ; feet very cold ; may have very severe headache or none at all ; feet get warmer with polyuria and complete relief. (3) A very intelligent man, aged 21. Cold feeling across forehead ; "wiggley blobs of light" which get stronger and obstruct vision ; rotating circles of light ; hemianopia black and white zigzags or fortification signs ; numbness of one arm and leg on the same side as the eye symptoms ; headache on the opposite side ; nausea and vomiting ; difficulty in thinking and speaking as the headaches get worse ; very depressed afterwards with metaphasia. One could multiply such instances, but the above will suffice to show that the regularity of the course is fully as great as that met with in some cases of epilepsy. It is very difficult to draw generalizations from histories which vary so widely, but reading a number of the severer case-sheets one after another, a strong impression is left that the aura, when it occurs, is regular ; that the light phenomena come next, and pave the way to scotomata, obscurations of vision, &c. ; that these lead on to headache, often beginning on one side and spreading all over the head ; that the headache is accompanied often by nausea and vomiting ; that recovery is often rapid and almost sudden.

**Differential
Diagnosis.**

I have, on several occasions, had migraine patients sent me with the diagnosis of *glaucoma* on account of headache and vomiting, or of revolving coloured haloes. The haloes of *glaucoma* do not rotate, and the other symptoms of the two affections are widely different. Some cases have been diagnosed as *cerebral tumour* in spite of the fact that the headache is not persistent, that there is no swelling of the optic discs and no evidence of permanent paralyses. In these the passage of time showed the true cause of the trouble. I have, on several occasions, known a diagnosis of *gastric ulcer*, of *gall-bladder trouble*, &c. made, and abdominal operation suggested. I am far from disputing that such operations may be useful in certain cases where a focus of reflex irritation or of auto-intoxication may be present, but I would urge that before undertaking so serious a procedure the obvious first step is the very careful correction of any errors in refraction or muscle balance.

Occasionally one meets with very puzzling cases in which the symptoms suggest *ear trouble*. It may be very difficult to determine whether this is the leading factor, or whether it is merely helping to excite a migraine, or is itself one of the phenomena of this widespread and ever-variable condition. *Photophobia* is so often met with as to make one wonder whether it is a causative influence. In any case, whenever it is associated with migraine it should be actively treated. There is no greater error than to teach a photophobic patient to "try to get used to the sunlight." The one rule for patients who are sensitive to glare is to protect their eyes therefrom by every means in their power. I have dealt with this subject at some length in my book on "Tropical Ophthalmology." Oxford Medical Publications. Section 2, chapters 2 and 3.

Rarely one meets with migraine cases in association with signs of commencing cataract. We know that in its early stages cataract sometimes gives rise to diplopia, polyopia and other unpleasant interferences of vision, and I have, from time to time, been puzzled to decide whether the lens disturbance was not a definite factor in exciting migraine in certain cases.

It is never safe to forget the other possible causes of nausea, giddiness, vomiting and headache, but it is probable that the opposite mistake is more often made and that many children with periodic sick headaches are treated for gastric and other abdominal troubles when a thorough examination of their refraction would dissipate their symptoms. Many of you will disagree with me and will remind me that the cobbler says "there is nothing like leather." I can at least assure you that I have careful notes and facts to back my opinion.

**The
Influence
of Age
and Sex.**

Of the 300 cases 88 were males (29.33 per cent.), 90 were unmarried women (30 per cent.) and 122 were married women (40.66 per cent.) They can be roughly divided into four age-groups. (1) Those up to 25 years of age, 47 (15.66 per cent.), of whom 10 were under 17 years of age; but we must add to these figures no less than 85 (28.33 per cent.) of older people who dated their migraine back to early childhood or to adolescence. This makes a total of 132 (44 per cent.) whose trouble began in early life. We are thus brought up against a staggering question. How is it that such a large number of cases in children are overlooked, or at least not efficiently treated for their trouble? I strongly suggest to you that it is because the eye-factor is not suspected, and the children's sick-headaches are consequently put down to indiscretions in diet, to excitement, over-fatigue, &c.

The amount of avoidable suffering and of incapacity for work in after-life thus occasioned is very great indeed. It calls for the most careful and methodical examination of the state of refraction in all children who suffer from cyclical vomiting. One elderly lady told me that in her girlhood she was so ashamed of these attacks that she never confessed to them, and that she used to run away and hide somewhere so that she might vomit unseen, a truly pathetic story. The remaining age-groups are :—

(2) Those between 25 and 40, 94 (31·33 per cent.).

(3) Those between 40 and 55, 120 (40 per cent.).

(4) Those over 55, 39 (13 per cent.). Of these four were over 70 years of age. One had his first attack at 71, following grief for the loss of his wife; the second, who consulted me at 74, had had trouble for many years off and on; the third, a married woman of 76, had her first attack three weeks before coming to see me, and that a very severe one; the fourth was an unmarried lady of 77. She had no marked headaches, but suffered from other migrainous phenomena, possibly due to commencing cataract.

Before making any deductions from these figures we must remember that many of the patients had been seeking relief for many years. Not a few of them had consulted a large number of nerve specialists and ophthalmic surgeons, so that their ages when first seen mean very little, but there are certain significant points to note: The patients below 40 number 141, those above 40 number 159. This in itself would throw doubt on the common belief that migraine tends to pass away as the patient gets older. We have additional interesting evidence on this subject. Out of the 300 cases 60 (20 per cent.) over the age of 30 definitely stated that they were getting worse. If we analyse this group we find it consists of: Married women, 35 (58·33 per cent.); unmarried women, 12 (20 per cent.); males, 13 (21·66 per cent.); whereas, as already shown, taking the 300 cases as a whole, the figures work out: Married women, 122 (40·66 per cent.); unmarried women, 90 (30 per cent.); males, 88 (29·33 per cent.). This would seem to show that the married state is a definite factor in aggravating the migraine. Is this connected with deteriorated health, pelvic disease, the worries and the work of bringing up a family and other conditions inseparable from the married state?

A number of cases start between 20 and 30. Though it is difficult to reduce this statement to exact figures owing to the unreliability of many of the histories, there can be no question as to its general accuracy. I believe that if it were possible to get the correct figures the results would be arresting. What does this mean? Is the increased tendency to migraine at this time of life associated with the period of greatest sexual activity, or with the commencement of the hard work of life, or what?

An allied question is the influence on migraine: (a) Of marriage; and (b) of pregnancy. The answer is far from simple, for so many factors enter into the case. One has to remember: (1) The possibly disturbing influence of sexual excitation to a degree probably unknown before; (2) the opposite factor of sexual satisfaction allaying nervous excitability; and (3) the exhausting effects of childbirth, especially if often repeated. It is difficult, if not impossible, to present reliable statistics of the influence of these conditions, but as I have had the subject before my very earnest attention for over twenty years, I may be permitted to suggest certain lines of thought. (1) There can be no question that in a certain number of women marriage definitely improves the general nervous condition and abates the tendency to migraine. I suggest that this is not infrequently due to the removal of a condition of chronic unsatisfied sexual hyper-

excitability, though the relaxation of the cervix after the commencement of pregnancy may occasionally be a factor of importance. The modern conditions of society imposing on a large number of men and on a still larger number of women, a sexual code that is against the first principles of nature, is responsible for a great deal of the nervous instability of the age. I am not discussing it as a moral question, or even as an ethical one, but purely on physiological and medical grounds. (2) There is equally little doubt that the frequent occurrence of pregnancy is extremely damaging to the health of a great many women. It is by no means unusual to find a refraction error of low grade leading to headaches and other nervous symptoms which, though of no great importance in themselves, point to a lowered state of general health and give a warning of worse in store if these danger signals are disregarded. I look on them as straws that show which way the wind is blowing, or as the falling glass which foretells the storm, and I think it is the doctor's duty to point out the necessity of birth control in the interests alike of the mother, of the children and of the husband. I include the last-named because a wreck of a wife is of little help or attraction to a man. In such cases I consider that the general practitioner should give every assistance and instruction in his power, and that we who specialize in ophthalmic work should recommend the patients to seek such help, either from their own medical men, or from one of the specialists in such knowledge. The spacing of births is a most important factor in the conservation of a woman's health, in the preservation of married happiness, and in the social efficiency of the children. At the same time, I would add with all the emphasis in my power a warning against the practice of intentionally childless marriages, an all too common evil to-day. I will not follow this subject further, but have felt bound to say this much, lest my true meaning should be misunderstood.

It has been stated that migraine never occurs during pregnancy. One of the patients had always had migraine except during her five pregnancies. One patient actually started her migraine on her honeymoon, and others after marriage and before the birth of a child. These latter cases support the suggestion I have already made, that sexual excitation may increase instead of allaying the conditions that give rise to migraine. It is of interest that in two cases migraine actually appeared for the first time during a pregnancy.

I have already referred to the widespread belief that migraine passes away as the patient grows older, and have shown that 20 per cent. of the patients over 30 definitely stated they were getting worse. I have also shown that more than half of these 300 cases first came for help when they were over 40. Do these facts necessarily show that the common belief is quite erroneous? Comparatively few of the cases admitted they were getting better with the passage of years, but it is dangerous to draw broad generalizations, for there are possible fallacies. Many of those who were really improving would not seek fresh advice and would, therefore, not come into such a series as our present one. Again, some of the patients had had their refraction corrected with more or less benefit; and yet this doesn't cover the whole ground, for a number of them did not date the improvement from a definite time when they adopted new glasses, but stated that it took place gradually, thus seeming to indicate that the migraine became less severe with advancing years. One can more easily understand this in the case of older women in whom active sexual impulses are waning, and especially after the menopause. On the other hand, migraine is, as might have been expected, often aggravated during this

period. Some of the patients complained that the migraine headaches occurred after menstruation had ceased, and at the dates when it might have been expected in the ordinary course. It is likely that in the above cases the factor of the female pelvis is possibly an important one in the ætiology of the case. How shall we explain the patients who get worse as the years go by? May it be that one factor is an increase in the influence of some auto-intoxic focus? Such a focus, growing for some reason in intensity, may swell the volume of the irritating afferent messages to the central nervous system, and so may intensify the storm that we know as migraine. Another factor of which one can speak with certainty is the advent of presbyopia. Quite a number of the cases which come for help are either beginning to be presbyopic or show an increase of an already existing presbyopia, usually complicated by the presence of other errors of refraction and of want of muscular balance.

The bearing on eye affections of anything which lowers the patient's general health is well known to every ophthalmic surgeon. What is true of glaucoma and of cataract is no less true of migraine. Influenza and other depressing diseases, the after-results of injuries, of accidents and of surgical operations, and last, but far from least, the mental stress occasioned by grief, worry, anxiety and overwork, blaze a trail right across these 300 cases. I would like to emphasize the truth of the old saying, that "it is worry and not work which kills." This leads on naturally to a discussion of what may be called

Debilitating Conditions.

The Fundamental Causes of Migraine.

What I am about to say anticipates to a certain extent my closing remarks on our conception of the nature of this affection, but I feel that it must be at least alluded to here. We recognize that various serious conditions are due to a breaking down of the even working of vasomotor control. In the case of glaucoma this breakdown is a very local one, and though the vasomotor storm is general the eye is singled out by reason of anatomical defects which probably date from birth. On the contrary, if we consider spasmodic inferences with the general blood-pressure, we find ourselves confronted with a widespread, if not universal, affection of the whole body. In migraine I think we have one of a great group of conditions in which the vasomotor mechanism is temporarily thrown out of gear over a limited, but possibly wide area. The normal control is lost, a storm is launched which tears its way along a *prepared path* in the nervous system with disastrous results to the patient's comfort. Let me ask you for a moment to consider a few cases. One is a boy of 14, whom I have very recently seen, and who has long been a victim of *asthma*. He volunteered the statement that since this condition had been remedied by treatment, an asthmatic attack might pass off into a migraine headache. This suggests the diversion along a different channel of a vasomotor storm. The next case is even more striking. A married lady of 61, who has for many years suffered from asthma and migraine, has recently developed paroxysmal tachycardia, and has found that the heart attacks are definitely brought on by reading if she uses both eyes. If she closes one eye she is free from this trouble. The interest centres in the fact that for near vision she has a very high exophoria. I have fitted her with prisms, base inwards, which appeared to give her immense relief. I am waiting for a later report on her progress. A third case: A very able man who suffers from migraine, used also to get spasmodic attacks of blood-pressure. These were brought on by anything which excited him, and especially by the sins of his fellow-motorists. His wife supported me in my

urgent recommendation that he should regard these things more philosophically. He was persuaded to do so with decided benefit, both to his general blood-pressure attacks and to his migraine. Then, all in the same line of thought, let me remind you once again of the connection which undoubtedly exists between migraine and that other source of wide and wild nerve storms which we term epilepsy. I hope I have made my view clear that in dealing with migraine we have to do with a loss of vasomotor control over a certain limited tract of the central nervous system, and that the impulses concerned are probably closely associated with an abnormal behaviour of the ductless glands, the adrenals being specially under suspicion. I must confess to being very ignorant of such conditions as asthma, spasmodic tachycardia and general blood-pressure. I hope you will not think it presumptuous of me to suggest such a wide generalization and to ask you to consider migraine as not standing alone, but as being one of a very large and very important group of cases which, while differing widely among themselves, have in common the factor of some disturbance of the vasomotor regulation of the body. My object is not to dogmatize, but to provide food for thought in the hope that some of you will make this very interesting subject your own and work at it. There is an observation which has a bearing on it. Some of the migraine patients state most definitely that their symptoms, and especially their headaches and the visual phenomena, come in distinct waves. A like observation is made by the subjects of spasmodic blood-pressure, and, I believe, by the asthmatics. Is this not suggestive of the occurrence of gushes of adrenalin secretion into the circulation? It would at least clearly seem to indicate that the cause of the trouble, whatever it is, is intermittent in the intensity of its action. Then, again, there is the observation already recorded, that eight of my patients felt specially well the day before an attack. I am told by physicians that some patients who suffer from blood-pressure feel specially well immediately before serious symptoms develop. Is it possible that in both cases we have to do with the toning up of the vasomotor system, which, while it may generate a feeling of well-being, may, nevertheless, be pushing the patient just on to the brink of danger, and then over it?

I have to regret that I did not inquire systematically for a history of heredity. Had

Heredity. I done so I feel sure that I would have much more material to lay before you, but the following cases show that inheritance is a distinct factor in migraine.

A male, aged 63; his mother and several brothers and sisters suffered. A doctor, aged 54; his grandmother and his mother had similar attacks to his own. A male, aged 46; his son had migraine. A doctor, aged 45; his father, his mother and his maternal grandfather all suffered. A married woman, aged 39; her father, a sister and a brother suffered. A boy, aged 9, and his mother had migraine. A young man, aged 25; his mother and grandmother were both troubled with it. A married woman, aged 48; her mother, her mother's family and her sister's child all had typical migraine. In other cases it is simply recorded that there was a family history of the trouble.

I have since ascertained that there were other histories of the same kind, but unfortunately I omitted to note them. I am now watching this subject carefully in the hope of obtaining more reliable evidence in future cases, and already have a number of recent ones to add. I give two: A married woman, aged 61, had suffered from asthma since she was 27, and from migraine of a severe type for many years. Her mother

suffered from asthma. An unmarried woman, aged 38, had had attacks of migraine for fifteen years. Her mother and her maternal grandfather both suffered from migraine.

There is a certain amount of evidence, both in these 300 cases and in the records of others, to indicate that auto-intoxication may aggravate the tendency to migraine and may actually bring on individual attacks. The symptoms present in some cases point to *gastro-intestinal trouble*, and a careful examination may reveal abnormal conditions of the digestive tract and its adnexa. Then again, a certain number of patients definitely state that some particular form of food or drink is sure to excite a migraine storm. Alcohol, coffee, cabbage, tomatoes, salt fish, fats, &c., have been indicted by some of my patients.

It is widely accepted, and this series bears the observation out, that uterine troubles have, in a certain number of patients, a very definite relationship with the periodicity of the attacks. Not a few say that the attacks are more frequent at the menstrual periods, and others have stated that after the menopause the attacks occurred at what might have been expected to be the period of normal menstrual changes.

Something has already been said on the influence of ear troubles.

I do not think it can be disputed that auto-intoxication plays a part in one way or another in paving the way for migraine attacks. It may do so directly by irritation of the central nervous system, or indirectly by lowering the patient's general resistance, or by both these means, or by yet again another method that one can only dimly envisage and which one can best express as a preparation of the path through the nervous system along which the storm of migraine tears its way. This may sound very vague, but in the present state of our knowledge it is all one can suggest. The point involved is one of great interest and I shall be very grateful for any suggestions on it.

Quite a large number of migraine cases ascribe their attacks to motoring or train travelling, to cinemas and more rarely to theatres, to watching tennis and cricket matches, and even, and far from infrequently, to a day's shopping in town, whilst a visit to a picture gallery is the most deadly influence of all. Most of these causes have one factor in common, namely, that the eyes are being used to a greater extent than normal for the close observation of moving objects. If you will watch a man sitting opposite you in a railway carriage you will be struck by the backward and forward movements of his eyes as he focuses fresh objects and allows his line of vision to slide back with the movement of the train and then to move forward to take a fresh position and so on. Most striking of all is the view of the spectators sitting at the side of a tennis court during a tournament. The to and fro movement of their heads and eyes is always safe to raise a laugh when depicted on the cinema. It is, however, from the point of view of fatigue, far from a laughing matter for many patients who are predisposed either to headache or migraine. It also explains why the seats at either end of the court are considered much preferable to those opposite the net, since the former involve much less extensive eye excursions than the latter.

The causation of picture gallery headache is, I think, quite different. It is here a question of the elevation of the line of regard being largely above the horizontal and so involving the action of the elevator muscles of the eye which are much less powerful than the depressors. The explanation of this doubtless lies in the fact that the development of the opposing thumb, on which the evolution of the brain of the higher mammals

has so much depended, determined that the constant line of regard for all near work lay below the horizontal line since the arms were below the head. Hence the greater strength of the depressor muscles of the eye as compared with the elevators.

Heavy near work is very apt to bring on migraine attacks which, none the less, may show a distinct periodicity. That the strain from near work is a factor is shown by the greater tendency to immunity from migraine when the patient is on holiday away from books and other forms of concentrated study. This is a class of case in which the fitting of suitable glasses is especially indicated and brings most gratifying results.

I have to confess that I started the investigations on which this paper is founded under a strong, but mistaken, preconception as to the role of various forms of refraction error and of hyperphoria in the causation of migraine. Fortunately, I picked out as a control series a number of other cases in which there were headache and other eye symptoms, but in which there were no signs of migraine. These cases were well over 260 in number, and all possessed the common factor of a pronounced hyperphoria. When they were compared with the 300 cases of true migraine certain facts at once stood out. (1) Whereas every one of them had hyperphoria, only 54 per cent. of the migraine cases had it, so we certainly cannot indict that defect in muscle balance as even the main cause of attacks of hémicrania. (2) The average refraction defect was severe and varied in both groups. An analysis was made of 100 consecutive cases in each of them. The percentage of hyperopia was 19 in both; that of myopic astigmatism was 26 in the migraine group and 31 in the other, the difference being possibly explainable by the comparatively small number under consideration. The highest figure in both groups was that for hyperopic astigmatisms, 55 per cent. in the migraine cases and 42 per cent. in the others. This at least suggests that the forms of hyperopic astigmatism are among the commonest errors of refraction to set up nerve storms, whether characterized by migraine or by ordinary headache. This observation is in accordance with what I believe will be a widely agreed opinion, and one which I, at least, hold confidently. Every conceivable form of refraction error occurred in both groups, so that there is obviously no evidence that any one of them necessarily leads to symptoms of migraine. (3) Many of the refraction errors and of the hyperphorias found, both in the migraine group and in the other group, are comparatively low, and yet a careful correction of such errors leads, in a very large number of cases, to highly beneficial results. This is an observation that has impressed me deeply for many years, and that impression has been accentuated by my study of these nearly 600 cases. The more highly strung the patient is, the greater the probability that he will be troubled by small errors of refraction. The oil-mill bullock plods round year after year in his restricted circle, seeming to suffer and to enjoy himself but little. It is the high-bred animal that plumbs the depth of fear, of excitement and of pain. When I am dealing with patients of this class, I am often reminded of the lines:—

“That the badge of rank in nature is capacity for pain,
And the sorrows of the singer lend the sweetness to his strain.”

It is, I think, generally admitted that many of the victims of migraine are highly intellectual and cultured people. In the series of cases I am discussing there have been a number of men and women who have made their mark in literature, medicine and other professions. Migraine, like gout, is a disease of an aristocracy, but it is

Errors of Refraction and Muscular Imbalance.

more selective inasmuch as it chooses its victims for their intellect rather than for their wealth or lineage. A number of patients are liable to nerve-breakdowns which may disable them for weeks, for months or even longer. When dealing with any such it is important to remember the close connection between the patient's general health and his eye symptoms ; the latter will often pass away when the health improves.

There is a class of case, unfortunately by no means uncommon, in which the subjects speak of their symptoms in superlatives, think only of themselves and unconsciously exaggerate all their troubles. They are often women spoiled by money or by husbands, but male representatives of the class are not lacking, and when they are met with are even more hopeless from the surgeon's point of view than the women.

My strong advice to a migraine patient is to wear the full correction, both for distance and for reading, and to wear it continually, leaving it off only when asleep or in a bath. There is one rule for the prince and the pauper, for the queen and the kitchen-maid, and this is that if the refraction error is, as I believe it so often is, the exciting cause of migraine or headache, relief will only be obtained by the constant wear of glasses. From time to time one meets with women who will not wear glasses. More extraordinary still is the fact that sometimes their husbands will not let them do so. Such are beyond the pale of help.

To discuss the treatment of refraction and of errors of imbalance would require a treatise, not a lecture, and is, therefore, impossible in this course, but there are some points which I would like to make. When the error of refraction has been corrected as closely as possible it will often be found that the amount of hyperphoric correction, which helps the patient is much less than that shown by objective tests. If a portion of the correction is given by a suitable prism and the patient is asked to wear it for two or three months, it will often be found that at the end of that time not only is he much better and able to do much more work, but also he can take a higher degree of correction for his hyperphoria with ease and added comfort. It may sometimes take quite a long time before the full correction is reached and comfort is attained. Moreover, in some cases the correction for hyperphoria has to be increased as the years go by, especially after any cause of debilitation, this being due to an actual increase in the defect. To help a migraine patient by means of glasses sometimes means patience and perseverance, both on the part of the surgeon and on that of the sufferer. It is important to impress on patients with latent hyperopia, with compound hyperopic astigmatism, or with hyperphoria, that the new glasses require getting used to. Some of the most successful cases one meets with are among those whom it is difficult to persuade to wear the glasses in the first instance. Until the right correction for all the errors present has been found by trial and error, it is a mistake to give bifocal glasses. Separate glasses should be given for near and distance vision, and both should be in large ovals. When the patient has, as it were, been ground into his glasses, he can be tested with them on his face, and differences in the prism or other correction can be added and their value easily estimated. I find it practically impossible to do this with bifocal glasses. I therefore make a habit in all cases of doubt, of avoiding such glasses until I am confident I have found the true correction. Esophoria rarely calls for the use of prisms, and exophoria still more uncommonly.

For many years I have been interested in migraine, and in the true correction of refraction errors. As time has gone on, I have benefited by experience and made my

notes more accurate and more comprehensive, until this series of 300 cases in the last ten years has seemed to afford material for a careful study of the condition. I recognize that it is venturesome, but I want to put before you an outline of this pathologic condition as it presents itself to me. One cannot fail to be struck by the tendency it shows to periodicity, to regularity of course, to variety in individual cases and to variation in the same case from time to time. Its most striking phenomena point to a disturbance of the occipital cortex, but its symptoms may spread far wider, affecting the whole or part of the sensory surface of the skin, a group of muscles, a limb, or one side of the body, and even such distant organs as the stomach, the intestines, the kidneys and the ears. You will forgive me if I speak in somewhat vague terms, but I envisage this condition as a storm that sweeps along certain and often very definite tracts of the nervous system. It looks almost as if there were a fault or line of weakness along which the storm finds it easiest to travel in each individual case. I can hazard no conjecture as to the influences which pave the way for such a line of weakness, but there is reason to believe that heredity at least sometimes plays a part. I would, however, like to repeat my suggestion that the storm is of vasomotor origin and is vasoconstrictor in nature. Once it is loosed, it finds its way along the weakened tract causing headache, visual phenomena, gastric disturbances, anuria, coldness, numbness, weakness and so on. I want further to suggest to you that this is no isolated group of phenomena. The man who suffers from spasmodic arterial blood-pressure experiences on a different scale and in a different direction, but with equal regularity, a series of unpleasant and painful phenomena, with pain, numbness, anuria and subsequent polyuria all in evidence. I have already spoken of the epileptic storms, of asthma and of spasmodic tachycardia. I believe this list could be much further extended, and that it should include the various allergic conditions.

What sets such a vasomotor storm in action and determines its course once it is started? I have tried to answer that in a preceding section, but I would like once again to draw attention to certain very leading features. Everything that lowers vitality paves the way for the trouble. Auto-intoxication helps to break down the resistance and to favour the passage of the storm in some particular direction, but I think that the factor that releases it is far most frequently to be sought in an error of refraction. If I may use a rough simile which I find helpful with patients, the nervous system is like an old-fashioned powder factory in which the powder was stored carefully in kegs or barrels and taken out for use when and only when required. At the door stood a sentry with a fixed bayonet. He challenged everyone who entered, no matter who they were, and demanded to know whether they had any matches on them. If they had, he made them give them up. The right of search was at his discretion. In addition, the floors were regularly swept and the barrels were inspected periodically for any sign of leakage. For a disastrous explosion to occur two conditions were requisite, (1) an untidy factory, and (2) the careless person with a lighted match. To me the ophthalmic surgeon seems like the sentry at the door, and the practitioner like the keeper of the factory. It is only by team-work between them that migraine can be overcome. If the ophthalmic surgeon is to be of real service his examination must be neither perfunctory nor superficial. I do not want to over-estimate the importance of my own craft, nor do I, for a moment, under-estimate that of the general physician and surgeon, but I feel confident that the key for the cure of these conditions is in large part the meticulous correction of refractive

errors and of muscle imbalance. Without this I believe that the physician labours but in vain. It is for him, however, to consider the very important questions of diet, of suitable modifications of the patient's environment, of sources of auto-intoxication, and every other condition which may unfavourably influence the patient's health. I allow full weight for the importance of all such measures, but I repeat once again my conviction, that if everything else is done and the eye trouble still remains uncorrected, or only partially corrected, a number of cases will fail to be cured.

Practical Points of Diagnosis and Treatment in Medicine.

A CASE OF LIVER ABSCESS (*ENTAMŒBA HISTOLYTICA*) TREATED BY OPEN OPERATION AND EMETINE.

Previous History.

THE patient, aged 36, presented himself complaining of malaise, fever, pain in the right root of the neck and shortness of breath.

November, 1920, to December, 1931, in North China; general health good. Malaria, 1923; gastritis, 1926; neither serious.

August or September, 1930: Amœbic dysentery diagnosed, treated with emetine and yatrín in Shanghai. Considered cured in October, 1930.

December, 1930: Violent attack bacillary dysentery on shipboard between Manila and Hongkong. Diagnosis and analysis made in Manila. Accompanying reports show the following: December 14, 1930, *E. histolytica* not found; December 15, 1930, *E. histolytica* not found. Recovered on shipboard *en route* to Genoa.

January, 1931, to January, 1932: General health started good but deteriorated to fair. Loss of weight during spring, fairly constant looseness of bowels, not serious enough to warrant consulting doctor.

Confined Bridgeport and Norfolk Hospitals, U.S.A., for brief period by trouble with oxaluria and cystitis—cleared without operation. Health improved during autumn but remained below normal due to abnormal activity, worry, &c.

March 1, 1932: Arrived England in fairly good health but soon became uncomfortable with right shoulder and some stomach pains, attributed to indigestion and cold which developed just before Easter (March 24). Discomfort with shoulder and stomach, also fever increased, culminating in pyrexia of 40.1° C. in Holland. Treated for four days by Dutch physician as influenza. Considerable trouble with loose bowels this period.

Returned England March 31. Fever less but shoulder and stomach pain continued. Consulted a practitioner who diagnosed the condition as after-effects of influenza and recommended electric treatment; five or six treatments taken with temporary relief, but pains gradually increased in severity—particularly stomach. Had slight fever this period and suffered from "cold and shivering fits."

May 1: Went to Brussels; during May 2 and 3, pains, shoulder, neck, chest and stomach. Right side, increased in severity, some fever.

May 4: Forced to go to bed, and on May 5 returned to London.