The importance of discriminating between prostatic obstruction due to fibrous changes and that due to hypertrophy lies chiefly in the danger of attempting enucleation in the former.

The transurethral resection method is a great success in treating fibrous obstruction provided proper regard is paid to the necessity for preliminary drainage. On the other hand, the application of this form of treatment in the wrong manner or in the wrong type of case frequently makes the patient worse, and is often dangerous. In certain selected cases of prostatic hypertrophy the unqualified success attending this form of treatment in two stages convinces me that the procedure has a definite place as a remedy in this disease.

Concerning prostatectomy, the greatest care must be exercised in choosing cases for the one-stage procedure, and greater care still if one of the open methods is to be employed. When in doubt as to whether the one or two-stage should be employed, it is better to choose the latter.

Success with the open methods of prostatectomy is largely a personal matter concerning the individual surgeon. The same may be said of perineal prostatectomy which, however, has the special advantage that it can be employed with all two-stage cases.

In determining ultimate success, skill and care plays no less a part in the after-treatment than it does in the actual performance of the operation.

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MIGRAINE AND MYSTICISM.¹

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

YOU will notice that the leading characteristic of migraine, apart from the headache and the tendency to nausea and vomiting, is the apparent perception of various striking visual phenomena. If the subjects saw these strange things when their health was at its best, they would look at them, either with startled astonishment, or with very real alarm. Now one of the things that has struck me very much in questioning a large number of migraine patients is the absence of either of these feelings in the description of their symptoms. They remember them afterwards rather than note them at the time, and under the advanced educational conditions of to-day they rightly ascribe them to a pathological condition which they have learnt is not of very serious significance.

Very widely different would be the mental attitude of a man who saw these startling phenomena with nothing to guide him as to their source and true meaning, especially if his mind were in that receptive condition for everything mysterious which characterized the visionaries of the past. The brilliant flash of coloured light, the golden halo behind

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

it, the elusive streaks of lightning playing constantly in front of his eyes, the appearance as of stars, sometimes in rapid movement, of flaming rotating wheels of light, of shimmering seas, of luminous streams or rivers, all evoke in his mind an impression of the supernatural, and bring into it a receptive condition for interpretations which it would otherwise probably reject. It has been suggested to me that this may be the natural means that God has taken to reveal His will to man. I want to make it clear from the start that I neither affirm nor deny this. It is completely outside the purpose of the present paper. I leave this aspect of the question severely alone and confine myself to considering my subject from the physical and medical points of view.

The first Mystic of whom I wish to speak to you is one to whom I have already alluded in my first lecture, namely, The Reverend Mother Hildegard of Bingen, who was born of noble parentage in 1098 and who, during a long life, exerted a great influence over a large part of the civilized world. She was a woman of an extraordinarily active and original mind, with a fine intellect, with considerable literary power and with a marvellous ability for depicting the numerous sensations to which her migraine gave rise. When you add to this that she had a remarkable faculty for imagination and a most devout spirit, you will readily recognize that she had all the makings of an outstanding mystic, and such indeed in very full measure she was. I am not in the least concerned with the crude nature of her scientific speculations, or with the literary value of her various works, which dealt with a large number of subjects. What interests me most is that several of my patients, looking at her graphic illustrations, have recognized in them without hesitation features of their migraine attacks, and this in spite of the fact that her drawings and paintings are nearly eight centuries old. We can quote her own statements as corroborating the view that it was migraine she suffered from, for she had seen these visual phenomena from her infancy up to more than seventy years of age, and they still continued; the attacks had been recurrent; she had never been in the least afraid of them (being persuaded that they were God-sent); and she saw them with her eyes wide open and with her other senses in full activity. She reminds us of Paul of Tarsus in her description of the bright light she saw as "more brilliant than the sun." The most interesting of her illustrations are the three in colour. I would call your attention to the golden light in each, and to the bluish-white fortification signs, which are immediately recognized by any patient who sees these phenomena to-day, and recognized with an enthusiasm that speaks volumes for the accuracy with which they have been delineated, and which makes it clear that they were painted at first-hand by the Abbess herself. I would ask you to listen to her own description ("From Magic to Science," Charles Singer. Plate XIII, p. 220). "I looked and behold a head of marvellous form . . . of the colour of flame and red as fire . . . It had three wings . . . white as a dazzling cloud. . . . And at times they would beat terribly and again would be still." In yet another picture (Plate XII, p. 204) we hear of a very bright shimmering point of red light from which fortification signs radiated; again the background is of gold. Above the fortress walls sits God the Father, of relatively enormous size, and girdled with a circular bastion. His feet are of gold and He has one hand raised in blessing and the other apparently conferring a book on His devoted servant. In her reconstructed view (Plate XIV, p. 238) the Heavenly City is four-square. The Son of Man sits above it with a roll in one hand and with the other

raised in blessing. A tower of strength is beside Him. The angel head with the beating wings is still there ; the fortification signs are unmistakable, and the blessed and the damned are apparently shown going to their last abodes. Before you leave this picture I would ask you to look at the wavy nature of its circular framework and at the still more distinct waves in the stream in the foreground. No less interesting is her "Vision of the Fall of the Angels" (Plate I, Frontispiece). "I saw a great star, most splendid and beautiful, and with it an exceeding multitude of falling sparks with which the star followed southward. And they examined Him upon His throne almost as something hostile, and turning from Him they sought rather the north. And suddenly they were all annihilated, being turned into black coals . . . and cast into the abyss so that I could see them no more." The zigzags also are obvious in the picture, but its greatest interest lies when we recall the fact that not a few migraine patients see falling stars or falling black spots which later pass on into an absolute central scotoma. This would appear to be what happened to the Abbess. Once again, she has forecast for us the experience of our patients of to-day. Now turn to the Reverend Mother's "Vision of the Trinity" (Plate XI, p. 199). It would seem to represent a revolving wheel of silver and gold lined with red, and it reminds us of Ezekiel's "Wheel in the middle of a wheel." Turn from this to her scheme of "The Macrocosm, the Microcosm and the Winds" (fig. 101, p. 214). Look at the stars on two of the circles ; the ripple, as of sunlight, on another ; at the fountains of light gushing from the heads of strange and fearsome beasts ; at the band of light below, and at the general sense of rotation conveyed by the whole picture. You have in this illustration alone, a number of the phenomena which we meet with in the most severe cases of migraine to-day. The only difference is that the very Reverend, but highly imaginative Mother Superior has filled in the heads of the fearsome beasts and made them vomit the dazzling streams of light, She has added an artistic botanical framework and a human centre-piece. Then turn to a picture of "Nous pervaded by the Godhead" (fig. 102, p. 216). She tells us that "the figure was robed in brightness of the sun, while the hands held a lamb shining with light." It is the spirit of the macrocosm controlled by the Godhead, represented by the face above it. I have placed this at a little distance from a migraine patient and he has hailed it as the kind of thing he sees when he speaks of zigzags. Come nearer to it and you will see the triumphant figure standing on the fallen serpent, which again lies on a "horrible black monster of revolting shape." In "The Arrival of the Soul in the Body of the Infant" (fig. 106, p. 228) we are again reminded of zigzag lines, and in the centre above is a square with a dark band down the middle and a number of dots on it ; this may well have been suggested by a scotoma or by the black spots we have spoken of as seen by migraine patients, or by the latter merging into the former. In studying this and other pictures, one wonders whether the subject's impressions of a hemianopia are running through them. I pass on to "The Days of Creation and the Fall of Man" (fig. 108, p. 232). Look at it with its stars, its wavy ripple lines, its suggestions of hemianopia, its circle above, which is surely revolving, and the figure smelling at a flower. This last reminds me strongly of one of my patients, a highly trained observer, in whom one of the earliest symptoms was always "a strange indefinable smell." The case is not solitary, for others have recorded the same symptom.

Let me remind you that some of our patients are much richer in migraine symptoms than others. This richness is, I think, more often observed in clever intellectual people

endowed with the creative type of mind. In the Abbess of Bingen we seem to have an extraordinary sample of this nature. She saw the glittering points of light, the stars, the ripple of sun on water, the revolving wheels, the gushing fountains and the rivers of light, the golden background, the zigzagging angel wings, and the fortifications of the city. From this rich material her visions were built up. The Ancient of Days sat on the city wall holding out a book for her, the Son of Man had a great scroll to give her, the Archangel with the beating wings figured in her visions. To-day she would have consulted her doctor and have been sent to an ophthalmic surgeon. Great as she was in the knowledge, or want of knowledge, of her time, she could only put upon what she saw the interpretations with which her education and her training had endowed her. Now I want you to go back with me to much earlier dates in the world's history, and in the light of what this wonderful woman saw, painted and interpreted, I would ask you to study the experience of some other great mystics.

The first Bible character that interests us is Moses. He had been a princeling in the palaces of Egypt, used to luxury and to the society and friendship of the leaders of the day. In a fit of anger he had killed an Egyptian; the story became known and he was forced to flee from the wrath of Pharaoh, and to exchange the comforts, pleasures and luxuries of a court for the hard lot of a shepherd in a strange desert land. You know how often adverse conditions of life promote eye troubles of various kinds and, not least among these, migraine. In his dreary loneliness Moses saw an extraordinary phenomenon, a bush that burnt and yet was not consumed. In seeking for a natural explanation of such an experience, and it is towards natural explanations that we all turn to-day, I know of none that is so simple and satisfying as migraine. Note that the first thing that arrested his attention was the burning bush, and *then* the Angel of the Lord appeared unto him in a flame of fire out of the middle of the bush (Exodus iii. 2). When we consider the experience of other mystics we shall notice the occurrence of the appearance "as of a flame of fire," and of the evolution from it of an Angel or some other mysterious visitor. "And Moses hid his face; for he was afraid to look upon God" (Exodus iii. 6). To-day he would have sought a physical explanation of the phenomenon, but at that time, given the man and the moment, the "vision" was all that was needed as the starting point of a great national movement. It sent the mystic back full of zeal and fire to liberate a downtrodden people. History is full of instances in which great things have grown out of small ones. Nor is this incident solitary in Moses' record. There is the pillar of fire by night which led the people. Again, there is the story (Exodus xxiv. 9 and 10) when Moses, with seventy-three others, went up the Mount, "and they saw the God of Israel; and there was under his feet as it were a paved work of sapphire stone, and as it were the body of heaven in his clearness." Also, there were accounts of lightnings and clouds in connection with this remarkable, if legendary, figure that makes one wonder whether the basis of some at least of his experiences was not laid in migraine. You will appreciate this point later, when we have considered some of the other mystics. Another feature that Moses' case at this time has in common with theirs is that his responsibilities and the burden laid upon his shoulders must have been immense during Exodus. If ever a man might reasonably be expected to have suffered from nerve-strain it surely was Moses. I am carefully avoiding any discussion of when the books formerly attributed to Moses were written, and am not pressing my point as to the origin of some of these visual phenomena. I would, however, like to meet in advance one

criticism that will certainly be offered, namely, that others are stated to have seen these things as well as Moses. I do not think that we need regard these accounts as scientifically accurate descriptions of what occurred. What interests me is that these incidents suggestive of migraine have somehow crept into the story; the analogy with the experience of later mystics sets one wondering as to their source. The experience of a migrainous man far back in the history of the Pentateuch might very easily solve our problem.

Next we come to Jeremiah.

Charles Francis Potter, in "The Story of Religion," writes :—

"The bright light which commonly appears at theophanies took two forms with Jeremiah : first, the snowy whiteness of the almond blossoms and, shortly afterwards, the blazing of an outdoor fire, on which a huge pot was boiling vigorously. A breeze from the north was fanning the flames and blowing the steam from the seething contents southward. From this incident Jeremiah deduced a message from God that 'Out of the north an evil shall break forth upon all the inhabitants of the land.' Well did Jeremiah know what the evil from the north was. The Scythians were coming !"

I am content merely to mention this without laying great stress upon it, but it is certainly suggestive.

I want to speak to you next of two characters who exerted a great influence, not only in their own time, but on the trend of thought of after-ages ; I refer to Ezekiel and Daniel. I am not in the least concerned with what parts of the books attributed to them they really wrote, or at what period those books were written, or even whether Daniel was really a historical character, but what does interest me is the suggestion that both these books bear evidence of authorship by sufferers from migraine. I will take Ezekiel first. He was among his fellow captives by the river of Chebar, in sorrowful exile, when he saw his first vision (chapter i, verse 1). At later dates he had similar visions (chapters viii and xl). In all these, visual phenomena predominated, though auditory played a part. In the first, "Behold a whirlwind came out of the North, a great fire infolding itself, and a brightness was about it, and out of the midst thereof as the colour of amber, out of the midst of the fire." It has been suggested that this may have been a natural phenomenon similar to what may be met with in the same neighbourhood to-day in the course of a cyclone. However that may be, the prophet then goes on to describe the four living creatures, each of which had four wings and their feet "sparkled like the colour of burnished brass." "Their appearance was like burning coals of fire, and like the appearance of lamps ; . . . the fire was bright, and out of the fire went forth lightning, and the living creatures ran . . . as the appearance of a flash of lightning." Then there are the famous wheels which have so powerfully interested students of the Bible for many centuries, and which were "like unto the colour of a beryl," . . . "a wheel in the middle of a wheel." These wheels accompanied the living creatures in their rapid movement up and down, and from side to side. The background of the picture "was as the colour of the terrible crystal." He saw "the likeness of a throne, as the appearance of a sapphire stone . . . and the appearance of a man above upon it," surrounded by "the colour of amber as the appearance of fire round about . . . and it had brightness round about." "This was the appearance of the likeness of the glory of the Lord." Ezekiel fell upon his face and heard the voice of one that spake to him and that bade him "eat this roll and

go speak unto the house of Israel." Again later, as he sat in his house, and the elders of Judah sat before him (chapters viii to xi), he had the second vision in which the sapphire throne, the appearance of fire and the colour of amber, as well as the moving wheels of the colour of a beryl, and the flashing wings of the cherubims figured once more. Later, chapter xl, *et seq.*, he was taken in a vision by an angel whose appearance was like the appearance of brass, and was shown in his own home-land a city which was being measured out by the angel and of which many details are given. "And the visions were like the vision that I saw by the river Chebar : and I fell upon my face." Then in chapter xlvii, presumably part of the same vision, he beheld waters issuing out from under the threshold of the house, waters that deepened till he could not pass over them.

The sapphire throne, the brilliant glory behind it, the golden fire that served as a background, the fluttering of the angels' wings, the flashes of lightning, the rotating scintillating wheels and the flowing streams of water are all highly suggestive of migraine phenomena. I would advance the idea that the basis of all the wonderful visions handed down to us by Ezekiel was the irritation of his occipital cortex by a vasomotor storm of the nature that we now speak of as migraine. I am not discussing the ultimate source of these visions, but merely trying to trace them back to their physical causes. The similarity between them and those of the Abbess Hildegard are extremely striking. It is more than likely that she knew and was profoundly influenced by the book of Ezekiel, but the fact remains that mysticism led these two remarkable people along the same lines of thought and interpretation. Ezekiel's man with a measuring reed measured the city and found it four-square, 500 reeds in length on each side ; "It had a wall round about." Cast your mind back to the Abbess Hildegard, to her four-sided city, built of blue and white glistening walls which after a lapse of seven and a half centuries are hailed with recognition by any patient of to-day who suffers from fortification signs. Does it not seem likely that this was one more of Ezekiel's migrainous phenomena ? There are one or two other points of interest. Though he was apparently surrounded by people on at least two occasions, no one else seems to have shared in the wonderful visions. Twice he mentions that he fell on his face, apparently at the commencement of the vision. Was this merely an act of worship, or may there have been an epileptic strain in the attacks ? Or again, may this falling on the face betoken the assumption of an attitude calculated to relieve the troubles of migraine ? Whilst I was writing this paper, a very intelligent and cultured woman volunteered the statement to me that when she got migraine she always threw herself face downwards to obtain relief. She could not be quite sure whether this was on account of the photophobia from which she suffered. It is, therefore, of interest here to recall the fact already mentioned in an earlier lecture, that photophobia plays a not infrequent role in migraine cases.

Then as to Daniel : he, too, purports to be a sorrowful captive in a strange land who saw wonderful visions. Chapter vii, "I beheld till the thrones were cast down, and the Ancient of days did sit, whose garment was white as snow, and the hair of his head like pure wool : his throne was like the fiery flame, and his wheels as burning fire. A fiery stream issued and came forth from before him : thousand thousands ministered unto him, ten thousand times ten thousand stood before him : the judgment was set and the books were opened." It is of interest to pause here for a moment to recall that there are only three books in the Bible—I speak subject to correction—which so vividly depict

God as seated upon a throne, Ezekiel, Daniel and the Revelation, and of these only the last two named mention the great hosts which surround the throne. I am endeavouring to suggest to you that the writers of these three books all give evidence of suffering from migraine. You will thus have some idea of the basis on which rests such hymns as "Ten Thousand Times Ten Thousand." Need I remind you of the emotionalism and of the fervour with which these hymns are sung, or of their influence on the convictions, beliefs and hopes of many of the singers. Later, Daniel has another vision in which a river plays a part, and the "little horn which waxed exceeding great . . . cast down some of the host and of the stars to the ground." He records, "I was in a deep sleep on my face toward the ground" (chapter viii). Then again, there is another vision, chapter x. He had been "mourning three full weeks" and living on a restricted diet; then by the great River Hiddekel he beheld a man "whose loins were girded with the fine gold of Uphaz; his body also was like the beryl, and his face as the appearance of lightning, and his eyes as lamps of fire, and his arms and feet like unto polished brass . . . the men that were with me saw not the vision, but a great quaking fell upon them, so that they fled to hide themselves . . . and *there remained no strength in me*: for my comeliness was turned in me into corruption, and I *retained no strength* . . . then was I in a deep sleep on my face." In the last chapter he sees a man clothed in fine linen upon the waters of the river, who speaks to him of wonderful mysteries. Once again, I ask you to examine the experiences of this mystic. The bright lights, fiery flames, wheels as burning fire, falling stars, lightning, lamps of fire, feet and hands of polished brass, the gold of Uphaz and the brilliance of the beryl are commandeered to express the vigour of his visual phenomena. He expressly states that he alone saw the vision, and his description (chapter x, 8) suggests that he felt dreadfully and miserably ill, whilst he reminds us of Ezekiel in his deep sleep with his face to the ground. Had he, too, an epileptoid element in his phenomena? He was like a number of our patients of the present day who, after an attack of migraine, feel battered and worn and ill, and take some time to recuperate. One such recently told me that her attacks lasted three days and that it was a further three days before she was really herself again. Others have had similar experiences.

We next come to probably one of the most interesting characters in the Bible, Saul of Tarsus, a man of great energy, who threw himself whole-heartedly into anything he did, and who was highly educated and endowed with a logical literary mind. His persecution of the early Christian Church was in its nature characteristic of the man. Whatever the cause he espoused, he spent himself recklessly for it. His journey to Damascus was undertaken under conditions of enthusiasm, exaltation and bigotry that were calculated to be mentally disturbing. He was described as "yet breathing out threatenings and slaughter against the disciples of the Lord." His after-history shows that he was a man of visions. He speaks of "the abundance of the revelations" granted to him. One cannot but regret that he did not tell us what he saw in Paradise or in the Third Heaven when he "heard unspeakable words which it is not lawful for a man to utter." One wonders whether the experience would have been like that of the other seers we have been discussing. "As he journeyed, he came near Damascus: and suddenly there shined round about him a light from heaven: and he fell to the earth and heard a voice . . . The men who journeyed with him stood speechless, hearing a voice, but seeing no man . . . and he was three days without sight,

neither did eat nor drink." We are not concerned to-day with the many contradictions met with in the three accounts of this dramatic incident, but certain things stand out from it and claim our consideration. Once again, it is a blinding light from above that arrests the mystic's attention. It is true that we know of no case in which blindness complicating migraine persisted for as long as three days, but no one who reads the three accounts we possess of the incident is at all likely to attribute accurate clinical observation to these records. Notice that like Ezekiel, Daniel and St. John, "he fell to the earth" under the influence of the vision. If we are to look for a physical explanation, I know of no other condition that will more closely fit the case than migraine. Again, if we may accept the statement that for three days he did neither eat nor drink, it would look as if he was very ill, as indeed he well might be on the assumption that it was an attack of epileptoid migraine with strong visual phenomena. Lastly, we have his own statement of "a thorn in the flesh to buffet him," in words which point to some recurrent and very painful malady. I do not wish to overstrain my argument, but I do not think that this possibility can be left out of calculation. Probably no man who has ever lived has had a more profound influence on the after-history of the world than that which was given to Paul of Tarsus to exercise. Migraine and mysticism! The garnering of the Gentile world into the Christian church, and all that it has meant to after generations!

We next come to the Revelation of St. John the Divine. It is no part of my purpose to discuss the questions of the mixed authorship, or of the meaning of this very mystical book, but I wish to direct your attention to the frequent evidence occurring in it of visual phenomena like those which certainly led the Abbess Hildegard, and which I think also led Ezekiel and the author of Daniel, and possibly Moses and St. Paul, to draw inferences of a mystical nature which have had a profound influence upon the thought of after generations. To begin with, St. John claims to have been a "companion in tribulation, and in the kingdom and patience of Jesus Christ . . . in the isle that is called Patmos, for the word of God, and for the testimony of Jesus Christ." Once again the suggestion is that we are dealing with a man under conditions of nervous tension, of sorrow and of suffering. There appear to have been a number of visions, but running through them all is the brilliant thread of visual phenomena. In the midst of the seven candlesticks he saw "The Son of Man . . . with a golden girdle. His head and His hairs were white like wool, as white as snow; and His eyes were as a flame of fire; and His feet like unto fine brass, as if they burned in a furnace . . . in His right hand seven stars . . . His countenance was as the sun shineth in his strength, and when I saw Him *I fell at His feet as dead.*" Right on through the book we find similar phenomena. Twice over, a star falls from heaven with terrifying results. Again, "One sat on the throne. And He that sat was to look upon like a jasper and a sardine stone: and there was a rainbow round about the throne, in sight like unto an emerald." There were lightnings, there were seven lamps of fire burning, and there was the flutter of the wings of weird and strange beasts, reminiscent of the ancient temples of Babylonia and Assyria. Round the throne were gathered in worship "ten thousand times ten thousand, and thousands of thousands." Later, the theme of the stars comes in again, "And the stars of heaven fell unto the earth." St. John demands of the Elder who these might be, "this great multitude which no man could number, of all nations, and

kindreds, and people, and tongues . . . clothed with white robes." The reply is, "These are they which came out of great tribulation, and have washed their robes, and made them white in the blood of the Lamb." Still the book goes on with lightnings, with hail and fire mingled with blood, with a great mountain, burning with fire, which was cast into the sea, the stars which fell from heaven with terrible results, with riders with breastplates of fire, and of jacinth and brimstone, riding horses out of whose mouths issued fire and smoke and brimstone. Again, another mighty angel descends with a rainbow upon his head, "and his face as it were the sun, and his feet as pillars of fire." Next comes the "woman clothed with the sun, and the moon under her feet, and upon her head a crown of twelve stars." Her adversary, the red dragon, draws a third part of the stars of heaven with his tail and casts them to earth: he vomits out of his mouth waters of flood to drown the woman.

This brings back to my memory a scene of some forty years ago. General Booth and his staff were on the platform, and a crowd of two or three thousand people, led by a fine band, were singing:—

My God what a morning ! what a morning !
When the stars begin to fall !

Before their eyes were the angels that will one day cast stars to the earth with disastrous results to mankind as prophesied by St. John, and the great red dragon, whose tail drew the third part of the stars and flung them on this little globe of ours. We need not linger over the astronomical impossibility of such a mental conception, but just accept that it all meant something tremendous, something strange, mystical and compelling to that vast audience.

Later, in the Revelation, we are told of a "sea of glass mingled with fire," of golden girdles, of a woman arrayed in purple and scarlet, of an angel whose glory lightened the earth, of the Rider of the white horse whose eyes were as a flame of fire, whose Head was crowned with many crowns and who wore a vesture dipped in blood. Next the devil is thrown into a lake of fire and brimstone, "And I saw a great white throne, and Him that sat on it, from whose face the earth and heaven fled away; . . . and I saw the dead, small and great, stand before God; and the books were opened; and another book was opened, which was the book of life." The terrible and terrifying story closes on a more happy note. "And I, John, saw the holy city, new Jerusalem, coming down from God out of heaven . . . having the glory of God: and her light was like unto a stone most precious, even like a jasper stone, clear as crystal; and had a wall great and high . . . and the city lieth foursquare . . . and the wall of it was of jasper: and the city was pure gold, like unto clear glass. And the foundations of the wall of the city were garnished with all manner of precious stones." The last chapter commences with "a pure river of water of life, clear as crystal, proceeding out of the throne of God and of the Lamb." Reliable commentators tell us that this book is full of quotations from the Old Testament from which much of its imagery is clearly taken. Two possibilities present themselves. Did the writer or writers of the Apocalypse take their material bodily from the books of the past, or are we to understand that they themselves saw the glittering figures, the flashing lightnings, the quivering wings, the dazzling throne, the lake of fire and brimstone, the falling stars, the sea of glass mingled with fire, the river clear as crystal, and the wonderful sights that are

mentioned on almost every page of this book, not forgetting the dazzling city with its wall of jasper and its background of gold? It matters but little, and whether the exile of Patmos himself saw these strange things, or whether he borrowed his imagery from the experience of his predecessors and especially from Ezekiel and Daniel, we come back in the end to the same rational explanation of the foundation of the visual phenomena and of all that has since been built on it. Given the erratic stimulation of the occipital cortex, occurring in one of the mystic type of mind, and the rest follows easily. The interpretation of the phenomena will largely depend on the past and present environment and on the mental equipment of the individual.

You will observe that with one important exception, I have dealt entirely with Bible characters, but I feel confident that many more illustrations of our subject can be obtained from outside this source. I would like to mention very briefly the case of Zoroaster, who is supposed to have lived about the sixth or seventh century, B.C. He was a mystic and visionary who dwelt in a mountain cave. His life was an austere one, and he passed through great agony of mind before he saw those shining visions, so reminiscent of the experiences of the Bible characters. His angel visitors returned at intervals, always accompanied by exceeding brightness; it may be pertinent that they appeared during the rigorous winter months. Fire was and is the sacred symbol of his religion, a religion which gave the world the devil and the hope of the ultimate triumph of good over evil, and which profoundly influenced Christianity. He and others, both inside and outside the pale of Hebraism and Christianity, might well repay a closer study later on in connection with migraine. I would mention in passing Swedenborg and Joseph Smith, the founder of Mormonism.

After dealing with the question of Zoroaster, a most interesting light is thrown on the subject by the story of the Buddha. Deeply mystical as he was, we hear nothing of bright lights, of angel visitors or of revelations vouchsafed from heaven. The man whose religion sways to-day one third of the human race was an atheist. He knew nothing of God or devil, and yet, by the irony of fate, he himself has been deified by his followers. One wonders what might have been the influence on after ages had this wonderful man been a sufferer from migraine.

The teaching of Confucius had much in common with that of Buddha, whose contemporary he is supposed to have been, though many long miles separated them, and they would not have understood a word of each other's language. The first great humanist, Confucius, taught the Golden rule five centuries before the birth of Christ, and his precepts have influenced the lives of many millions of Chinese, but like Buddha, he seems to have had no beliefs in any anthropomorphic deity, or in angel visitors or such phenomena. Like Buddha he had no theophany. He seems just to have hammered out his beliefs on the cold anvil of reason, unillumined by any brilliant light and untaught by angel voices.

In closing, I would desire to focus your attention for a moment on the possibilities, as I conceive them, of this relationship between migraine and mysticism. Start with the brilliant central point of light, with the golden background, with fluttering zigzags, with fortification signs, with the play of light on water, with jets, streams and rivers of light, with burning revolving wheels and with other phenomena of the kind. We know well to-day that these may be consequences of pathologic irritation of the occipital cortex, probably of vasomotor origin, but this was not known in the past. The

explanation of the unknown was ever wrapped in mystery, and the mind that sought it was often attuned to mysticism. The sapphire throne and He that sat upon it; the Ancient of days before whom stood ten thousand times ten thousand; or again, He that sat upon the great white throne when the books were opened, or the vision of the conquering martyrs and saints, came easily to the mystic type of mind. But these visions did not end there; on the contrary, they were handed down by the devout from generation to generation, and their influence and importance in no wise diminished as the centuries slipped away. The Abbess of Bingen is but a connecting link between the early mystics and those of to-day; she does not stand alone, but her forceful personality, her migrainous attacks and her marvellous power of portraying vividly what she saw, have singled her out for our interest and attention. The mystic is just as much with us to-day as he was in the past, though his mysticism now takes other forms, and is rarely, if ever, founded on the visual phenomena of migraine, but the influence of the seers and prophets of the past is still strong, not only on him, but also on a very large proportion of our contemporaries. Take away from the Bible the books of Ezekiel, Daniel and the Revelation, or at least take away from these books the elements of mysticism, which I have endeavoured to show you have developed from migrainous phenomena, and what a difference you would make to the accepted beliefs of the present day. I have shown reason to think that we may admit Moses and St. Paul into the same great company. If we do so, then the profound influence of migraine on the beliefs and on the trend of thought of the world will be realized. It is for these reasons that I have named this lecture "Migraine and Mysticism."

USE AND ABUSE OF TOES.

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IN this article I want to state the case for the toes; the attention of the public, both lay and medical, has for too long been concentrated on the arches of the feet alone.

The toes are designed to perform *two* functions, *prehensile* and *ambulatory*, and because of this their structure and musculature are more complicated than appears on the surface.

The mechanism of the foot is that of a lever of the second order with the fulcrum at the metatarsal heads, and for any system of levers to work efficiently the fulcrum must be stable and the lever rigid.

When walking on soft, crumbling soil, it is easier to progress barefooted because the toes can grip the ground and stabilize the fulcrum, but for ordinary walking on a firm, smooth surface, the necessity to stabilize the fulcrum no longer exists.

The important consideration, then, is *how to prevent wear and tear of the fulcrum from constant use*; for it is a matter of common knowledge that when all the weight constantly falls on the metatarsal heads, metatarsalgia, in varying degrees of acuteness, inevitably occurs.

To avoid this Nature has devised a method of enlarging the area of the fulcrum which operates effectively at whatever height the heel is raised from the ground.