"Provided the patient is in a good state of general health and is not losing weight, the presence of sugar in the urine is not, to my mind, a contraindication to the performance of an operation, so long as diacetic acid and acetone are absent. The wound heals well, and convalescence does not appear to be interfered with. It is an obvious indication to make a careful examination beforehand and to attend to the diet and to the general regimen on such lines as will ensure the patient being in as favourable condition as possible for the ordeal before him."

The above is an extract from my book on *Tropical Ophthalmology*, published in 1920 (p. 502). I would not go back on a word of it. It has always appeared to me that to deny a hope of sight to a patient on the ground that he has sugar in the urine is unnecessary, and often cruel. The same remarks apply to patients suffering from wasting and nervous diseases.

Much stress has been laid on the difficulties of operating on a patient with pathological tremor. Even the presence of a very marked and persistent tremor adds comparatively little to the difficulties, either of the iridectomy or of the extraction, when undertaken by a skilful surgeon, though doubtless it might considerably embarrass a beginner.

The leprotic eye is rare in this country, but I should like to record my conviction, founded on clinical experience, that major operations on the eye, such as iridectomy, extraction, and trephining, do well even in advanced cases of leprosy. The wounds heal with remarkable rapidity, owing, presumably, to the vascularized state of the tissues, and material advantage is often gained, even in cases that appear to offer but little hope. The general condition of the leper must always be attended to first.

Announcement of the Diagnosis of Cataract to a Patient.

I have many times seen a patient who has been shocked, frightened, or made very indignant by the blunt announcement to him or her of the diagnosis of cataract. Sydney Stephenson used to say that the greatest factor in the success of a medical man, and especially of an ophthalmic surgeon, was "human sympathy." I have always agreed most cordially with this dictum. Apart, however, from the sheer folly of handling a man or woman faced with so serious a condition as cataract in the way I have alluded to, there is another point of great importance. The term "cataract," flung in a reckless way at a patient, often conveys a totally erroneous impression to his mind. We as surgeons distinguish between a large number of quite different conditions, all of which we class as cataracts. Some of them are more or less rapidly progressive, and lead to blindness which can only be relieved by operation; others are partial and of very slow progress; indeed, such cataracts often change so slowly that the patient dies many years later with useful sight to the last. To call these "cataracts" is technically correct, but practically very unsound, for it has two results: (1) it frightens the patient and gives him and his relatives years of needless misery whilst a sword of Damocles hangs suspended above their heads; and (2) it drives him to quacks, who charge him large sums of money for dropping harmless solutions in his eye, and who point triumphantly over a series of years to the wonderful effects of their remedies in "delaying" the progress of the disease, "which a surgeon of repute diagnosed and said could only be treated by operation." Medicine is largely a matter of common sense and of the application of common-sense principles by a sane and sympathetic mind. If, in the end, we have to tell a patient that he really has a cataract, of the variety that he understands by the term—the kind of thing his uncle or his father had and was operated on for—it is essential that we should place ourselves in his position and break the news to him as gently and as sympathetically as it can be done. This advice is not at all "the flogging of a dead horse"; many times every year I meet with people who have been "shocked" by the manner in which the diagnosis of cataract has been conveyed to them.

Promises of Results from Operation.

From time to time one meets with a patient who is bitterly disappointed because, according to his statement, a surgeon has promised him a good result and failed to get one. It seems very unlikely that any surgeon would

promise a good result, but it is most important that in every case the patient should be made to understand clearly that, in such operations as those for cataract, promises are impossible, and that the most a surgeon can do is to state the probabilities. Any other course is dangerous to the surgeon's reputation.

Limitations of a Patient's Activities during the Development of a Cataract.

Whilst a cataract is progressive, ought we to limit the patient's activities. I see a number of people who have been told not to read or write or "strain" their eyes. The idea is to avoid causing the cataract to advance. To my mind, these rules are founded on no solid basis. My rule for cataract patients is, "Go right ahead, live a normal life, forget all these directions, and make your own experience your guiding rule. It is probable, or at least possible, that anything which makes your eyes tired or causes them to ache or gives you headache is bad for you; therefore avoid all such things or cut them down to the point where they do not produce symptoms, but do not go farther in this direction." I believe that if a cataract is going to advance nothing the patient can do will retard it; on the other hand, if it is not advancing or is doing so slowly, I doubt if the ordinary use of the eyes will prejudicially affect the course of the case. I have very frequently released patients from these troublesome restrictions which have been put upon them, and I have never found they were any the worse for this freedom. The advance of a cataract appears to be a trophic change, comparable to the wrinkling of the skin or the loss of hair, and the only treatment I have ever found to be of the slightest use has been the exhibition of thyroid gland in suitable cases. This has several times seemed to have been of great value. I do not put the case any stronger than that.

Restraint and Invalidism after Operation.

In the three weeks or longer, after leaving the nursing home between a preliminary iridectomy and an extraction, a patient can usually carry on his ordinary work, always provided that it does not cause pain to either eye, but after extraction it is most inadvisable for him to attempt to do this for at least a month, and even then he must carefully feel his way. When, however, it is a case of using his brain and not his eye, there is no reason in the world to prevent him directing his business as soon as he leaves the home, or even earlier when it can be done by reports read to him and instructions taken down by a stenographer.

A most important thing after operation is to protect the eye from chills, and especially from those due to wind. I insist, for some time afterwards, on the steady use of goggles when the patient is in the open air unless the day is windless and warm. In the house he can wear a shade or his ordinary glasses or his goggles or nothing, according to which seems more comfortable to him.

HUNTINGTON'S CHOREA.

WITH REPORT OF TWO CASES.

BY

C. WORSTER-DROUGHT, M.A., M.D.CAMB.,
M.R.C.P.LOND.,

PHYSICIAN TO THE WEST END HOSPITAL FOR NERVOUS DISEASES AND TO THE METROPOLITAN HOSPITAL;

AND

I. M. ALLEN, M.D.N.Z., M.R.C.P.LOND.,
SENIOR RESIDENT MEDICAL OFFICER, WEST END HOSPITAL FOR NERVOUS DISEASES.

HUNTINGTON'S chorea is defined as a hereditary disease characterized by irregular movements, disturbance of speech, and progressive mental deterioration. First described by Lyon in 1862 as chronic hereditary chorea, it was further investigated by Huntington and later by Davenport, who found nearly one thousand cases in four great family groups. The salient features of the disease, as determined by Huntington, are heredity, the late onset, and the mental changes.

The cases reported presented certain interesting contrasts which render them worthy of discussion. In the first case the disease ran the usual course of choreiform movements

beginning in early middle life and continuing for some years, followed by the gradual development of dementia. In the second case this order was reversed—an occurrence noted by Davenport during his investigation of the disease, but certainly very uncommon in the history of the condition. Dementia preceded the onset of choreiform movements by nearly four years. The history of the family for three generations has also been investigated, and five further cases of the disease were found. Among them was one case in which choreiform movements were present without the development of dementia. In addition, the manner in which the disease is inherited is considered as far as possible from the material available.

Personal Cases.

CASE I.

This patient, a woman, was first seen in September, 1923, when she was 40 years of age. She then complained of being nervous, of constant twitching movements, and of difficulty in walking. These symptoms had appeared four or five years previously, when she was between 35 and 36 years of age. She became apprehensive in the presence of strangers, was easily startled, and tired on slight exertion. Sleep was good. All other functions were normal. Three years before she had had an operation for removal of the appendix, and had apparently become much worse since then. The family history is dealt with in another section of this paper.

Condition on Examination.—The cranial nerves were all normal. Sensation was normal. Motor power, muscle tone, and the deep reflexes were all normal. The plantar reflexes were flexor. The other organs were healthy. The patient looked ill. She was constantly grimacing, her speech was explosive, and she exhibited movements characteristic of Huntington's chorea. The gait was stiff and awkward, somewhat like that of hemiplegia. At that stage the choreiform movements, the grimaces, the explosive speech, and the gait were all regarded as characteristic of Huntington's chorea, an opinion which was supported by the fact that it was known that the patient's father and paternal grandmother had also suffered from the same condition.

The patient was placed in a nursing home, and there she appeared to be quite happy with her surroundings. Two months later it was reported that she appeared to be unduly exciting herself about her business affairs, and was apparently making herself worse. Her condition was such that it was considered advisable to obtain her admission to a mental hospital as a voluntary boarder.

By March, 1928, the patient was becoming rather excitable from time to time, possibly as a result of the change in her surroundings.

Further Examination (June, 1929).—The choreic manifestations were not materially worse, but there was evidence of some degree of mental deterioration. Generally, she was rational in her behaviour and answered questions correctly, but was inclined to reiterate the answer or an observation several times. For example, she repeated a number of times the sentences: "My only brother looks after all my money affairs," and "Will the chorea die out as I am not married?" Apart from the chorea, her behaviour was rational. Her scholastic attainments were fairly good. She was able to read, but writing was very difficult and slow on account of her motor disability. When trying to write her hand was quite steady, but the head, face, and tongue continued all the choreic movements.

Her social capabilities were normal. Ideation was fair, but some degree of dementia was present. Her intelligence was limited. Perception was also limited. It was necessary to repeat a question several times before it was perceived. Emotionally, she was good tempered, was not depressed, but rather cheerful. Her attention was difficult to hold, and she was inclined to wander off into repetitions of what she had said. Recent memory was poor, but that for remote events was rather good. Orientation in regard to time and space was normal. Her reasoning power and ethical attitude were fair. There were neither hallucinations nor delusions. Sleep was good, nutrition was good.

When walking she constantly assumed attitudes, the hands and arms being thrown out alternately in a gesticulatory fashion, the feet being put down sharply and grotesquely, the wrist rotating and the fingers constantly flexing and extending. The head was carried somewhat forward. The patient continually grimaced, especially with the frontalis muscle, which was in a constant state of elevating the eyebrows. The movements were quieter when the patient was lying in bed.

There was a slight increase in tone in the upper part of the arms, the shoulder girdles, the thighs, and the pelvic girdles. The pupils were moderate in size and reacted normally. The optic discs were normal. There was no nystagmus. The ocular movements were normal. It was impossible to protrude the tongue, probably on account of its frequent choreic movements. The palate moved normally. There were constant facial grimaces.

The other cranial nerves were normal. The tendon-jerks in the arms were present and equal. The knee and ankle-jerks were sluggish and equal, and the plantar reflexes flexor. There was no Rombergism. Co-ordinated movements were performed satisfactorily. No other abnormalities were detected on physical examination.

CASE II.

The elder sister of the above patient came under notice in June, 1924, when she was 45 years of age. She herself complained of nothing except nervousness and a fear of traffic.

History of Present Illness.—Inequality of her pupils had been noticed when examining her sister, whom she accompanied at the time. For three months she had been strange in her manner and had done foolish things, such as selling a house at much below its value. She had become loquacious and unusually silly.

Family History.—She lived apart from her husband. The rest of the family history is dealt with under a separate heading.

Condition on Examination.—The right pupil was slightly larger than the left. Both reacted sluggishly to light and consensual stimulation, but briskly to accommodation. The optic discs were normal. Her speech was "wide" and slightly slurred, but she was able to say "British constitution" correctly. There was no tremor of the tongue or of the lips. The other cranial nerves were normal. Sensation was normal. The upper limbs were normal, and the tendon-jerks present and equal. The lower limbs were normal; the knee-jerks present and equal; the ankle-jerks present and equal; and the plantar reflexes flexor. The abdominal reflexes were very sluggish. There was no tremor of the hands. Co-ordination was fair. The other systems were normal.

The patient was excitable, loquacious, and irritable. She asked childish questions, and was obviously unfit to manage her private affairs. She was dishevelled and slovenly in her appearance, and not fully dressed even in the afternoon, contrary to the custom of her social status. She laughed uproariously, inanely, and frequently at trifles and without due cause. She stated that she was bankrupt, which was not the case. Her conversation was frequently irrelevant and incoherent. She was dirty in her habits. She stated that her brother was an inveterate gambler, which was untrue. Facts observed by others showed that she was frequently abusive, used foul language even in front of her children, and had attempted violence to those about her, so that they were compelled to run away from her.

Cerebro-spinal Fluid.—There was no excess of cells; the Noguchi test resulted in very slight flocculence; the Lange colloidal gold test showed no changes; and the Wassermann reaction was completely negative. The blood Wassermann reaction was also negative. Because of her mental condition the patient was then certified as of unsound mind.

In March, 1925, her mental condition was no better. She had improved as regards her personal appearance and physical condition, probably as a result of the care bestowed upon her. She had more control over her speech and emotions. The mental deterioration was, however, still present.

In October, 1925, the patient was more demented. She was dirty in her habits and slovenly in her appearance. Her speech was slurred. She was very emotional. Maniacal attacks occurred at intervals. On examination slight proptosis of both eyeballs was observed. There was a slight von Graefe sign. The pupils were normal. Slight tremor of the hands was present. The reflexes were all brisk. The knee- and ankle-jerks were present and equal. The plantar reflexes were flexor. No other abnormality was detected. On the whole the mental condition of the patient had deteriorated.

Further Examination (June, 1929).—The patient was re-examined on this date with the following results.

Cranial Nerves.—The pupils were equal and reacted normally. The ocular movements were normal. There was no nystagmus. The face was rather fixed in repose. The other cranial nerves were normal. It was impossible to test the sensation satisfactorily on account of the patient's mental condition.

Upper Limbs.—Motor power was diminished in both arms. Muscle tone in the right arm was slightly increased in the proximal groups of muscles. In the left arm tone was much increased in all groups of muscles, more particularly proximally. The left arm was held flexed across the chest both at rest and when walking, together with partial flexion of the wrist and fingers. The right arm assumed the same position but to a lesser degree. It was impossible to elicit the tendon reflexes on account of the increase in muscle tone.

Lower Limbs.—Motor power was decreased in both legs. Muscle tone in the left leg was increased in all groups of muscles, but more particularly in the proximal groups. In the right leg tone was slightly increased in the proximal groups of muscles. The left leg was extended. There was no wasting. The knee- and ankle-jerks were present and equal. The plantar reflexes were indefinite.

Gait.—The whole body moved *en masse*, with the left arm held flexed across the front of the chest. The right arm was slightly flexed, while the right leg was in an extended position. The left leg was extended and moved stiffly. The arms did not swing.

Spontaneous Movements.—There were no movements when the patient was alone or at rest. On attempting to speak or to perform any action typical choreic movements appeared. There was constant grimacing; the tongue was protruded at the right angle of the mouth; the arms were twisted and turned, but their movements were much less pronounced than those in the face. There was occasional and slight twisting of the body.

Co-ordination.—In carrying out the finger-nose test with the right hand, the choreic movements appeared at once, but the patient succeeded in reaching the object although by a roundabout route. With the left hand the choreic movements began at once and the patient desisted.

Mental Condition.—She talked constantly in a loud voice, was quarrelsome, and hit the attendants without warning. Her recent memory was poor, but she remembered how long she had been in the hospital. There was perseveration in both speech and action. Once a line of speech or action was begun, it was repeated several times, during which it was impossible to introduce anything else to her attention.

The Family History.

The subjoined table illustrates the occurrence of a similar condition in several members of the family, the dark letters indicating the members affected or suspected to be affected. In most cases some details of the clinical history were available, so that it has been possible to identify the condition in each case.

Records of three generations of the family are available. In the first generation, the disease appeared in three members of one family—namely, No. 1, the third child, a male; No. 2, the fifth child, a female, who married and had a family; and No. 3, the eighth child, a female who also married and had a family. The daughter (No. 2) had three sons, the second of whom suffered from the disease (No. 4). Her elder son had two daughters, each of whom developed choreiform movements between the ages of 10 and 12. These are discussed as No. 5 and No. 6. The third member of the original family affected (No. 3) had a daughter and a son, the former being killed in early childhood and the latter becoming affected in middle life (No. 7). He was the father of the two patients described in this paper (Nos. 8 and 9). These patients were respectively four and sixth in the family, the three eldest children having escaped and the fifth having died of diphtheria at the age of 7. The information available about the affected members of the family is as follows.

No. 1.—Male, the third child of the original family. The condition appeared at the age of 50 years, and the patient died unmarried at the age of 81.

No. 2.—Female, the fifth member of the original family. No information is available except that she developed the disease shortly after the age of 40 years, and died at the age of 86.

No. 3.—Female, the eighth member of the original family. She was born in 1806 and appeared to be a very bad case of the disease. From information given by friends who remember her, it is believed that she developed the disease about the age of 50 years, and died at the age of 81.

No. 4.—Male, the second son of the patient (No. 2) described above. The disease appeared at the age of 40 years, and the patient died at the age of 70. He suffered from movements of the face and limbs, but no mental symptoms were present.

No. 5.—Female, the daughter of the eldest brother of No. 4. Movements began at the age of 10 years and continued until her death at the age of 25 in childhood.

No. 6.—Female, the sister of No. 5. Twitching and movements began between the ages of 10 and 12 years and have continued since, the patient now being 30 years of age and living abroad. It is very doubtful if in either of these sisters the condition is Huntington's chorea; it is quite likely to be one of conversion hysteria. The occurrence of such a release phenomenon in a

family, the members of which are subject to Huntington's chorea, however, is worthy of note. It was further ascertained that a member of the same generation, a female, the daughter of No. 4, was deaf and dumb in childhood, but so far has developed no signs of the disease.

No. 7.—Male, the only child of No. 3 who survived to adult life, and the father of the two patients described in this paper. He developed movements at the age of 44 years, coincident with a period of domestic anxiety. He became steadily worse until the age of 49, when he was relieved of his employment, "as his health was unequal to the work." He then became rapidly worse and was soon almost as bad as his mother, who was then 81 years of age and died soon after. He continued in a business of his own until he was 54, but it was always a worry and a trouble to him. He was constantly falling about and hurting himself. Up to the age of 50 he had contortions of the face and limbs, but was not difficult to manage. After that age, however, he had many fits of passion and it was practically impossible to do anything with him. This state of affairs continued for several years. He was continually threatening to commit suicide, and would go away from home on every possible occasion, once being found in a police station and on another occasion falling off a station platform on to a railway line. It was apparent to his relatives that his mind was becoming deranged. He was certified at the age of 57. During the following year he was exceedingly troublesome, but later became quieter. He collapsed suddenly and died at the age of 59.

Clinical Commentary.

In the first patient movements of the face and limbs appeared between the ages of 35 and 36 years, and when the patient came under observation the character of the movements left little doubt that the condition was Huntington's chorea. This opinion was supported by the presence of grimaces, explosive speech, and a grotesque gait, and by the knowledge that the patient's father and paternal grandmother had suffered from the same condition. About five years after the onset slight evidence of mental impairment appeared, in that the patient became unduly excited over trifles. During the next five years the mental condition deteriorated very little. Some degree of dementia, however, supervened during the eleventh year of the illness. The patient's intelligence and perception were limited, her attention was difficult to hold, and her recent memory was poor. An interesting feature of her condition was a tendency to repeat phrases and sentences several times, during which it was impossible to introduce anything else to her attention. This tendency to repetition was apparently of the nature of perseveration rather than the type of word repetition known as palilalia and occurring sometimes in association with post-encephalitic Parkinsonism and bilateral lesions of the pyramidal tracts.

In the second patient the diagnosis was much more difficult, and in fact, apart from the family history, would have been impossible for five years. The patient was first seen at the age of 45 years with symptoms which indicated that a degree of mental deterioration was present, and suggesting a diagnosis of dementia paralytica. This condition, however, was excluded by the negative results of examination of the cerebro-spinal fluid. An involutional psychosis could not be excluded apart from the family history. The patient's mental condition slowly but steadily deteriorated for four years, when grimacing, explosive speech, and rigidity of the limbs appeared and confirmed the diagnosis of Huntington's chorea, in which dementia alone had at first been present. At this stage rigidity of the limbs of the extrapyramidal type was present, more on one side than on the other, and to a greater degree than in the first patient; perseveration of speech and action was even more pronounced. Also, there was present the same exclusion of everything else from the field of attention until the repetition of the word, phrase, or action had ceased.

Davenport has drawn attention to certain "biotypes" of the disease, all of which are comparatively rare. One of these is illustrated by the second patient, in whom dementia alone was present for four years before the choreic movements appeared. Such a variation of the disease may lead to serious difficulties in diagnosis. In the second "biotype" mentioned by Davenport, that in which the movements are present without any dementia, diagnosis is not so difficult. In fact, in many cases, chorea may be present alone for some years before the onset of dementia—a sequence of events which is the usual feature of the disease. In the first patient chorea only was present for five years, and then for a further period of five years

the evidence of mental deterioration was still rather indefinite. A better illustration of the second "biotype" is a member of a previous generation of the family (No. 4). In this patient, a male, movements were present for thirty years—from the age of 40 until death at the age of 70—and no mental symptoms appeared. A third "biotype," that in which the disease appears early in life, might be suggested by two patients in the third generation (Nos. 5 and 6). As, however, it has not been possible to obtain access to these patients, it is difficult to decide whether they had suffered from Sydenham's chorea at the age of 10 and the movements had persisted as a mimesis, whether they suffered from a conversion hysteria as a result of maladaptation due to a slight defect of mentality, or whether they suffered from a true "biotype" of Huntington's chorea. The fact that the latter disease had not affected either of their parents would suggest, however, that one of the former conditions was present.

An anatomical feature common to the two cases recorded was the presence of an extrapyramidal type of rigidity, presumably as a result of the partial release of the postural reflex path from cortical control. In the first patient it was comparatively slight; in the second patient it was extreme on the side on which the choreic movements were most pronounced, and present in lesser degree on the side unaffected by the movements. It would appear, therefore, that although the lesion usually affects the basal structures responsible for the conduction of the afferent impulses controlling voluntary movements, it may affect other basal structures first and produce some degree of extrapyramidal rigidity before the onset of choreic movements and dementia.

Commentary on the Family History.

An investigation of the family history of the patients revealed the presence of five other definite cases of Huntington's chorea in the two previous generations. There was no information available about the history of the family outside the three generations. In the first generation one male and two females were affected. The former died unmarried, while each of the latter transmitted the disease to one son. There was no evidence of the occurrence of the disease in the offspring of the unaffected members of the family, apart from the two doubtful cases (Nos. 5 and 6). In the second generation only two males were affected. The first male (No. 4) did not transmit the disease, but the second male (No. 7) transmitted it to two daughters. It might appear that the disease, which affected both males and females in the first generation, affected only males in the second generation, and only females in the third generation. This observation is, however, invalidated by the fact that in the second generation none of the female offspring of those affected in the first generation survived long enough to develop the disease. It is interesting to note, however, that in one branch of the family an affected female transmitted the disease to a male, whose daughter was deaf and dumb in childhood; while, in another branch, an affected female transmitted it to a male, whose two daughters were later affected. There is some evidence that the disease may predominate alternately in males and females in successive generations. It is reasonable to expect, therefore, that any male children of patient No. 8 might have become affected if a dominant antichoreic factor has not overcome what is possibly a recessive tendency to the disease, as it appears to have done in the other branch of the family. Apart from such speculations in the family studied, there is insufficient evidence upon which to correlate the method of inheritance with the known laws of heredity.

Of the seven definite cases of the disease in this family, the lowest age of onset was 36 years, and the highest 50 years, the age of onset in the other cases varying between these two limits. Of these cases, five followed the usual course of choreic movements upon which dementia eventually supervened; one suffered from movements without dementia, and one suffered from dementia for four years before the onset of choreic movements. The three affected members of the first generation survived to over 80; the two in the second generation died at 70 and 59 years respectively; while the two affected members of the third

generation are still alive at 50 and 46 years of age. It is interesting to note that while the tendency to the disease is apparently becoming less in successive generations, probably as a result of the dilution of the strain, the duration of life of those affected is apparently becoming shorter, possibly because of the concentration of the toxic factor in those affected.

Summary and Conclusions.

1. Two cases of Huntington's chorea are described in detail, the clinical course in one approximating to the classical type and in the other characterized by the presence of dementia for some years before the appearance of choreic movements.

2. The family history has been investigated for three generations, and notes on five further cases of the disease added.

3. The clinical features are discussed and attention is drawn to the fact that two important variations of the disease—namely, dementia preceding chorea, and chorea without mental symptoms—have appeared in two generations of this family.

4. The family history is discussed and attention drawn to the following points: (a) the transmission of the disease only through affected individuals; (b) transmission through both males and females; (c) an apparent tendency to the transmission of the disease alternately through males and females; (d) the association of a lessened tendency to the disease in successive generations with the appearance of deafness and dumbness in childhood, and what may be psychoneurotic states; and (e) an apparent lessened expectation of life in those affected in successive generations.

X-RAY TREATMENT OF THE COMMONER MICROBIC DISEASES OF THE SKIN.*

BY

J. B. HIGGINS, M.B., CH.B., D.M.R.E.,
HONORARY RADIOLOGIST, SALFORD ROYAL HOSPITAL.

In the words of a dermatologist of world-wide reputation, the history of x-ray therapy in relation to diseases of the skin may be divided roughly into three eras—namely, the optimistic, the pessimistic, and the realistic. This analysis appears to form an accurate, if somewhat cryptic, description of the progress of x-ray treatment since its inception about the year 1896. The results obtained by the earliest workers were regarded at that time as bordering on the miraculous. Then followed a series of mishaps and a few disasters, which soon brought considerable discredit on this new form of treatment. This eventually led to a careful investigation into the effects of x rays on the normal and pathological skin, improvement in apparatus, and more reliable methods of dose estimation, until at the present time x-ray therapy ranks as one of the most reliable factors in the treatment of many skin diseases.

To-day we are concerned particularly with the x-ray treatment of the more common microbic diseases of the skin, and I propose to discuss briefly the methods employed in the x-ray department of the Manchester and Salford Hospital for Diseases of the Skin which have produced satisfactory results.

The application of the rays in the group of diseases under discussion varies considerably, and depends chiefly on the nature of the infection and the condition of the skin at the time of treatment. The rays when they are absorbed into the skin produce certain biological changes in each of the individual cells exposed to them. These changes, according to Hertwig, are supposed to be due mainly to molecular dissociation of colloidal albumins by the secondary rays which are generated when the primary rays strike the body cells, the process being analogous to dissociation of gases by means of ionization. Packard, on the other hand, has evolved a theory which states that control of the mechanism of the living cell is carried out by certain substances called enzymes, which are present in every cell, and concerning which we know very little.

* Read in opening a discussion at a joint meeting of the Sections of Dermatology and Radiology and Radio-Therapeutics at the Annual Meeting of the British Medical Association, Manchester, 1929.