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

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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.

Thus a certain dose of the rays will increase the activity of the enzymes and through their agency stimulate the metabolism of the cell. A rather larger dose will inhibit the action of the enzymes and render the cell inactive. Still larger doses cause destruction of the enzymes, thus resulting in the death of the cell. Recently Holzknecht, Caspari, and others have denied that x rays have any direct stimulating effect, and prefer to regard any stimulating effects which may occur as due partly to the results of the early changes which precede injury, and partly to the indirect results of the suspension of inhibitory influences in the cell. Whichever view one may take, however, the undeniable fact remains that small doses of x rays have a decidedly stimulating effect on certain skin diseases, of which acne vulgaris is a striking example.

The most essential factor in the treatment of microbial skin infections is a thorough appreciation of the degree of sensitivity of the skin in its normal state and in its various pathological conditions. The greater sensitivity of the diseased cells which is invariably present permits an effective dose to be given to them without injury to the surrounding healthy skin. The only effect on the latter will be of a mildly tonic stimulating nature.

In the presence of hyperaemia accompanying the pathological condition, however, such as is found in many cases of sycosis, the question of suitable stimulating doses becomes more complex, as we are dealing with a skin which is no longer normal, but which has become definitely hypersensitive. Thus the margin between stimulation of the affected cells and injury to the surrounding hyperaemic skin becomes considerably narrowed.

The diseases of the skin which come under the heading of "commoner microbial diseases" are as follows: acne vulgaris (and indurata); sycosis vulgaris; paronychia (due to pus-forming organisms); furunculosis (including carbuncles).

ACNE.

The type of acne with which the radiologist most frequently comes into contact is acne vulgaris (including acne indurata). In this so-called microbial infection it is now generally agreed that x -ray treatment is the method of choice, in that a satisfactory result can be obtained safely and more rapidly than by purely medical means. It is not, however, suggested that x rays are indispensable in the treatment of this condition, as cases of very mild acne are cured without its aid, while some workers prefer the use of ultra-violet radiation.

The apparatus used at the Manchester Skin Hospital consists of a 16-inch coil. The rays are emitted from a Coolidge tube and are of the quality produced by a kilovoltage of approximately 120 and a milliamperage of $3\frac{1}{2}$, or in other words a collection of soft and medium rays at an equivalent spark-gap of $6\frac{1}{2}$ in. Working under these conditions it has been found that an erythema dose estimated by the use of the Sabouraud pastille can be produced in approximately two minutes at an anticathode skin distance of 8 inches.

Dosage has usually consisted of a preliminary course of three or four half skin doses unfiltered, and administered at an interval of seven days between each dose. Following this a similar course has been given, but a filter of 0.5 mm. of aluminium is used. The following table shows the dosage administered in a series of 37 consecutive cases of acne vulgaris (15 males and 22 females) treated recently.

Table showing Number of Treatments in 37 Consecutive Cases of Acne Vulgaris.

ACNE OF FACE.				GENERALIZED ACNE.	
Males.		Females.			
No. of Cases.	No. of Treatments.	No. of Cases.	No. of Treatments.	No. of Cases.	No. of Treatments.
1 ...	3	3 ...	3	1 ...	5
2 ...	4	4 ...	4	1 ...	10
1 ...	5	8 ...	5	3 ...	12
2 ...	6	3 ...	8	1 ...	13
1 ...	7	2 ...	10		
3 ...	8				
1 ...	9				

Of these, 31 constituted affections of the face, and 6 generalized acne—that is, involving the face, back, and chest. The average age of the males was 18.3 years, that of the females 22 years.

The total dosage varied between three and ten treatments, each consisting of three or four half skin doses unfiltered, and followed by the remaining doses with the use of a 0.5 mm. aluminium filter. In one case, however, only one-third pastille doses were given, while in two cases a 1 mm. filter was employed following the initial unfiltered dosage. Of the 31 cases of acne of the face the results in 4 were indefinite, though there is no actual record of failure in any of those treated. Two of the 6 cases in which the back and chest were involved showed indefinite results, while one failed to respond satisfactorily after thirteen treatments.

Several methods differing in detail from that just described have been employed by various workers. These constitute differences in the doses administered and in the use of filters. The methods of MacKee on the one hand, and of Arzt and Fuhs on the other, show appreciable differences in their employment of filtration. Both use rays of medium quality and advise the employment of fractional doses, though MacKee uses a quarter skin dose and gives a preliminary course of sixteen treatments at intervals of seven days between each. In stubborn cases, in the absence of erythema or wrinkling of the skin, he considers it permissible to continue treatments for two additional months. If a cure is not effected after six months it is advisable to discontinue x -ray treatment. He also states that while it is possible to cure a case of acne vulgaris in one or two treatments by giving at one sitting a quantity sufficient to produce an erythema, such treatment cannot be criticized too severely.

Arzt and Fuhs employ a filter of $1/2$ to 1 mm. of aluminium and administer doses of two-fifths of a skin dose. Three or four treatments are given at intervals of ten to fourteen days. After an interval of four weeks the whole cycle may be repeated, and after a further period of eight weeks, still a third cycle, the whole extending over thirty-two weeks. In deep indurated cases they advocate three-fifths skin doses through 2 mm. aluminium from the commencement.

Most dermatologists and radiologists will agree with MacKee that large initial doses in the treatment of acne are both inadvisable and unnecessary. The individual doses used in the present series are certainly larger than those employed by him, but in order to avoid any risk of erythematous changes a 0.5 mm. filter of aluminium is used after the third or fourth treatment.

Comparison with the total dosage administered by MacKee and Arzt and Fuhs shows that the former gives a total of four to six skin doses, while the latter give a total of six to eight skin doses. The present series shows that an average of five to six skin doses in each case is required to produce a cure. Thus it would appear that the curative effects of x rays on acne depend not so much on the degree of filtration, or quality of the rays employed, as on the total quantity of the latter which are absorbed by the skin. Any attempt to standardize skin dosage in terms of quantitative absorption, however, is to be deprecated, for the actual amount of absorption required to produce a cure depends on two important factors; these are, the type of skin to be treated, and the interval between treatments. It is a generally accepted fact that the skin of a blond will respond more readily—or, in other words, absorb the rays more readily—than will that of a brunette, and considerably less dosage may be required to obtain the desired result. It should also be remembered that the shorter the interval between treatments the greater will be the cumulative effects of the rays. If there be any advantage in the method of treatment employed in the present series, it lies in the fact that most cases can be cured in approximately seven or eight weeks, with no ill effects.

As previously mentioned, it is believed that fractional doses of x rays act on the pathological skin cells through the stimulation of their controlling mechanism, and it has been supposed that in cases of acne the affected cells are stimulated to resist the influence of the infecting

organism, and, in successful cases, to cause its death. On the other hand, it is possible that inhibitory influences appear in the infected cells. In this way the organism becomes deprived of its nutrition and dies.

Whether the rays act directly on the bacillus itself was until recently a matter of considerable controversy. Investigators have varied widely, in that some authors believe there is a good bactericidal action, others note stimulation effects, while still others observe certain biological changes. In 1912 Chambers and Russ succeeded in sterilizing cultures of *Staphylococcus aureus* in suspension. For this purpose they used 0.5 millicurie of radium salt per cubic centimetre of the medium. Kloverkorn in 1925 carried out experiments on the bactericidal and retarding actions of x rays on *B. coli* and *Staphylococcus aureus*. Freshly grown cultures on agar were not killed after the administration of 120 skin doses. With 50 skin doses and upwards colonies exhibited biological changes, such as loss of pigment and irregularity in the colony outline, as well as inhibition of growth. The actual death of these organisms, however, was only accomplished in cultures twenty-eight days old, and with 120 skin doses.

In view of these experiments it may be said with safety that the bactericidal action of x rays, as used in the treatment of acne, is *nil*, while any inhibitory effect on the growth of the bacillus which might occur may be regarded as negligible. On the contrary, it has been my experience that doses up to eight skin doses result in stimulation of freshly grown cultures on agar of *Staphylococcus aureus*.

SYCOSIS.

Sycosis, as the result of a microbic infection (sycosis vulgaris or sycosis pyogenica) is a condition which presents peculiar difficulties in its treatment. As we know, this form of sycosis manifests itself in the appearance of a number of small red papules arising from the hair follicles of the beard. These may remain localized, with comparatively little inflammation around them, or may spread rapidly and become closely aggregated. Coalescence of the papules may result in the formation of crusts, and may be associated with marked hyperaemia. The lesions also vary considerably in their distribution, and may be limited to two or three small patches, or may involve the whole of the hair-bearing area of the face and neck.

The factor of vital importance in the treatment of this condition may be summed up in the one word "hyperaemia." Hyperaemia is almost invariably associated with sycosis, and may vary from a negligible degree to one of generalized acute inflammation. Thus one is dealing with a hypersensitive skin, which will respond to a given dose of x rays in proportion to its degree of inflammation. A real difficulty, however, arises in the fact that one cannot determine with certainty the exact degree of the response to be expected. Even normal skins show slight variation in sensitivity to the rays, a feature which becomes considerably magnified in the presence of inflammation.

Three methods of treatment are open to the radiologist: (1) epilation of the beard; (2) stimulation of the affected cells; (3) a combination of these two methods.

It is impossible to lay down any hard-and-fast rule in the choice of method to be employed, as each individual case varies and must be judged on its merits. There are, however, certain general principles which must be observed if one is to avoid disaster. The acutely inflamed skin, such as is found in a mixed infection, should on no account be treated until some successful effort has been made by other means to reduce the hyperaemia, and even then the early administration of a dose sufficient to produce epilation is attended with grave risk. In such cases we are left with the alternative of administering very small stimulating doses—actually not more than a one-third skin dose at weekly intervals. In cases of moderate hyperaemia stimulating doses are again the rule, though, the skin being slightly less sensitive, it is usually safe to administer half skin doses. It is frequently found that cases of the inflammatory type treated by the above methods show very marked improvement. The greatest success from the radiological point of view is obtained in those cases which show practically no hyperaemia. The dosage may be carried

to the point of epilation, which appears to constitute the ideal method of treatment. Such cases, if complete epilation is effected, can often be cured rapidly by other means.

A series of 36 consecutive cases of sycosis were examined, but owing to the fact that x -ray treatment formed only a small proportion of the total treatment administered, no very helpful conclusions can be drawn. It is worthy of note, however, that of these 36 patients, 10 received single epilating doses, 9 of whom were cured, while the average total duration of treatment was two months. Of the remaining 26, 15 received half skin doses, and 6 one-third skin doses. In one case epilation was successfully accomplished with a three-quarter skin dose on a mildly hyperaemic skin, while in one other case a two-thirds skin dose failed to produce epilation.

It has been our experience that mild stimulation of the infected beard produces marked improvement in the majority of cases, though as long as the infected hairs remain we cannot hope for a cure through the medium of x rays alone. A rather remarkable result was experienced quite recently.

The case was that of a man who had sustained severe burns on the greater part of the face. When first seen, two years later, the latter was a mass of scar tissue, with the exception of the under part of the chin and a small area on the left cheek. These two areas, together with the one eyebrow which still remained, were infected with sycosis. Two small ulcers were present in the scar tissue itself, while the whole face showed an appreciable degree of hyperaemia. Epilation was quite out of the question, and it was eventually decided to give small stimulating doses. Three one-third skin doses were administered, two of which were given through a 0.5 mm. aluminium filter. After a lapse of six weeks, during which time he had carried out medicinal treatment, the patient again reported for inspection, and the response had been remarkable. The ulcers had healed, and there was practically no trace of the previous infection.

This case is of particular interest in that no attempt had been made to produce epilation, yet there appeared to be a vast improvement in the condition.

A case of supposed spontaneous cure has also occurred in my own experience.

The patient, a man of about 35 years of age, was suffering from a mild sycosis of the beard, with practically no hyperaemia. Epilation was attempted, and the patient was again seen one month later. Examination revealed that, in spite of the fact that no epilation had occurred, the condition had cleared up completely, and there has been no recurrence.

We are quite unable to understand this result. It is just possible, however, that this patient had inadvertently received rays from an unduly hard tube, that the majority of the rays, being hard, penetrated the superficial layer of the skin and stimulated only its deeper cells. Owing to the small proportion of soft rays insufficient were absorbed during the time of exposure to produce epilation. This theory, however, is by no means a complete explanation of what must be regarded as a spontaneous cure.

It is our practice to treat sycosis, except in very few cases, without the use of filters, a proceeding which it must be admitted is open to criticism, particularly in those cases which exhibit marked hyperaemia. While no ill effects result from administration of such small stimulating doses, and though considerable improvement may result, it seems quite reasonable to assume that the use of a thin filter—for example, 0.5 mm. of aluminium—would allow the administration of rather larger dosage without fear of untoward results. I have not had the opportunity of comparing the respective merits of these methods, but other workers have long used varying degrees of filtration. Some therapists, indeed, go to the length of producing epilation of the beard through a filter of 2 mm. of aluminium. This method does not appear to be entirely satisfactory, requiring as it does considerably larger doses than by the unfiltered method. Moreover, it is liable to result in unpleasant consequences, such as temporary paralysis, and occasionally swelling of the salivary glands.

The results obtained in the treatment of paronychia by x rays have not proved very encouraging. Six cases have been treated during the last two years, and of these only two were definitely cured after the administration of eight half skin doses to each. The results of two were indefinite, while two were not cured at the end of seven months and ten months.

I have had practically no experience of the treatment of furunculosis and carbuncles, though other workers seem to have experienced good results, particularly in the former condition.

Schreus has noticed that irradiation of boils in one area (one and one-fifth skin dose with 2 mm. aluminium at 20 cm. anticathode skin distance) has resulted in gradual decrease of the number of fresh ulcers appearing in other parts, until finally the condition has cleared up entirely. He suggests that the changes in the irradiated skin are probably due in the first place to the destruction and absorption of the staphylococci and diseased tissue cells. This tends to result in a form of auto-vaccination, with the production of specific protecting bodies, and the creation of some degree of resistance and immunity. This so-called immunizing action of the rays may be further reinforced by the use of autogenous vaccines.

SUPERSOFT RAYS.

In conclusion, the recent work in the treatment of skin diseases by means of supersoft rays is of such importance that this paper would be incomplete without a brief reference to this method of treatment.

Several experiments by Bucky and others have been carried out in this field, dating from 1912, and have culminated in a paper on "Supersoft Röntgen rays in dermatology," by J. J. Eller, which was read before the New York Röntgen Society in 1927. These rays were produced by means of a specially constructed transformer unit and a Müller tube, and were of the length produced by a kilovoltage of 8 and a milliamperage of 8. One unit dose was considered the dose which was necessary to produce a mild erythema within twenty-four hours at an anti-

cathode skin distance of 6 cm. Working under the above conditions this was accomplished in three minutes.

It is claimed that the use of supersoft rays has certain advantages over the rays of shorter wave-length in general use. Supersoft rays are similar to medium x rays in that they produce an erythema, have penetration, may produce pigmentation, and have cumulative effects from successive treatments. They differ from the biological effects of harder rays in that erythema may appear almost instantaneously—that is, within two or three hours, or even less (compare three days to fourteen days with harder rays). Penetration of supersoft rays is much less, hence one or two erythema doses can be given without temporary or permanent epilation.

Following larger doses Schultz reported cases in which actual ulceration occurred. These ulcerations were painless and healed without atrophy of the surrounding skin after fifteen months. No atrophy of the skin, telangiectases, or malignant manifestations have been noticed two years after marked erythema doses, though these, of course, may appear later on.

Among many skin diseases treated, mention is made of acne vulgaris. The results of treatment in this condition were not particularly good, certainly no better than by the present-day methods of treatment. Good results, however, are reported in the case of sycosis, paronychia, and carbuncles.

This method of treatment by supersoft rays is at present in its infancy, but it will—in the opinion of workers in this field—ultimately find an important place in the treatment of dermatological conditions. It is believed, however, that these rays will never replace entirely the medium rays as used at the present day.

RECTAL ETHER-OIL ANAESTHESIA, WITH SPECIAL REFERENCE TO BRAIN SURGERY.*

BY

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It is surprising to find that the administration of ether per rectum was first described as early as 1847. The method employed then and up to about 1910 was that of pumping ether vapour into the bowel, and, though the results were encouraging, the method was acknowledged to be more complex than that of ordinary inhalation anaesthesia.

The properties and action of ether in oil per rectum were first investigated by Dr. Gwathmey of New York, who read a paper on the subject in London in 1913, since when this method of administration has been taken up and proved by many anaesthetists. Dr. Gwathmey himself inspired me to try this method, and during the past two years I have used it in over seventy cases, using a modification of his technique.

The uses of rectal ether-oil in general surgery are very wide, and its very safety has made it the anaesthetic of choice in all bad surgical risks in my hospital practice. But for the lack of time I would use it far more extensively. Of the cases selected for the use of this method I have records of umbilical hernia, cholecystectomy, cholecystostomy, exploratory laparotomy, nephrectomy, appendicectomy, total and subtotal hysterectomy, and breast operations. The method was employed on account of the following conditions: debility, extreme nervousness as in hyperthyroidism, obesity, heart conditions with failing compensation, chronic lung conditions, and anaemia.

It will be seen from the range of operations quoted and the relative seriousness of the conditions which determined the choice of a rectal anaesthetic that this method should have a wide application in operations which impose a prolonged strain on the patient. In looking over a series of more than fifty cases of brain operations I am quite convinced that in this particular branch of surgery rectal anaesthesia is invaluable.

Before going on to a description of the technique used in brain surgery I should like to mention what appear to

me to be a few of the advantages of this method. First, in a brain operation access to the patient's face is necessarily difficult owing to the position and towels, etc.; this makes an inhalation anaesthetic difficult to administer, particularly if the patient does not tolerate ether vapour well. Under a rectal anaesthetic it is not necessary to look at the patient's face, if in the original position his airway is quite clear. The quiet even breathing makes it very rarely necessary for the anaesthetist to interfere, as the jaw is not sufficiently relaxed to obstruct the air passages. Secondly, the dose of ether compares very favourably with the amount used by any inhalation method. Six ounces of ether will give a four hours' anaesthesia. I do not know exactly how much ether I have used in giving a similar length of anaesthetic by intrapharyngeal ether vapour, but it is nearer 16 ounces. Thirdly, while the patient is under the influence of rectal ether the anaesthetist has time to take observations and to chart them during operations. In all brain cases I have records of the systolic and diastolic blood pressure, pulse, and respiration taken every ten minutes. The stage of operation is noted and correlated with these. The chart is completed with an account of the induction and all the pre-operative drugs and the amount of anaesthetic. This record forms a very valuable indication of the patient's condition during operation and is a guide as to how far the operation may proceed without undue strain on the patient. Operative shock can be detected in its earliest stages and treated accordingly.

Technique.

The ordinary rectal ether-oil technique has to be adapted to these brain operations, owing to the length of time which the operations take and to the special conditions which exist.

The actual technique of administration of the mixture per rectum is exactly the same for brain work as for general surgery, but for the fact that morphine in any form is strongly contraindicated because it tends to congest the tissues of the head. This unpleasant fact changes the whole picture. It is comparatively simple to give a rectal anaesthetic with morphine, but it is a very difficult matter without it, owing to the varying effect of ether on the individual.

The technique which I am going to describe is fairly constant, and is the outcome of work on over fifty cases.

* A paper read in the Section of Anaesthetics at the Annual Meeting of the British Medical Association, Manchester, 1929.