opinion that bacterial contamination of food by a "chronic carrier" was the cause of the initiation of the outbreak, and that the occurrence of subsequent cases was due to the usual factors of contact in a community in which acute carriers were numerous. In a selected series of 44 cases it was found that only 50 per cent. had ceased to excrete the organism by the end of the fourth week, that 2 were still positive after seven weeks, and one case positive after fourteen weeks. In two fatal cases the organism was recovered from the bile and spleen. The records of this outbreak do not lend support to the view that human carriers may not be an important source of infection. In civil life, owing to many different factors, the outbreaks are rarely examined in the same satisfactory fashion.

The laborious analysis of the salmonella group which has been carried out by Bruce White by the method of receptor-analysis has added greatly to our knowledge of these organisms, and has enabled him to correlate many apparently discordant bacteriological findings. The outstanding feature of this work from the food-poisoning aspect is the demonstration that the great majority of food-poisoning outbreaks in which organisms have been isolated are due to *B. aertrycke*. The problem of the source of infection of food materials still remains obscure, and extensive bacteriological investigations of animals and birds in contact with man may require to be carried out before satisfactory explanations are forthcoming.

The classification of the salmonella group which Bruce White has put forward shows an intimate relationship between the various members with regard to their antigenic structure which it would be out of place to discuss here. It is, however, permissible to say that there is in this work no satisfactory explanation why variants closely allied in antigenic structure should vary markedly in their toxic and invasive properties in animals. It would be a great advance in knowledge if these properties of individual strains could be definitely correlated with their antigenic constitution. The extension of this work to the field of active immunity against salmonella infections in animals is of the utmost importance towards our understanding of the phenomena of bacterial food poisoning in man.

BIBLIOGRAPHY.

- Andrewes: *Journ. Path. and Bact.*, 1922, 25, 505. *Ibid.*, 1925, 28, 345.
Savage and Bruce White: Medical Research Council, Special Report Series, 91, 92, and 103.
Doyle: *Journ. Comparative Path.*, 1927, 40, 71.
Pryer: *Amer. Journ. Public Health*, 1929, 19, 208.
Geiger and Meyer: *Proc. Soc. Exper. Biol. and Med.*, 1928, 26, 91.
Bahr and Dysegaard: *Acta Path. et Microbiol. Scan.*, 1928, 5, 116.
Dack, Carry, and Hannon: *Proc. Soc. Exper. Biol. and Med.*, 1928, 26, 49.
Branham, Robey, and Day: *Arch. Path.*, 1928, 5, 742; and *Journ. Bact.*, 1928, 15, 36.
Savage and Bruce White: *Journ. of Hygiene*, 1925, 24, 37.
Hamburger and Rosenthal: *Deut. Arch. f. klin. Med.*, 1918, 125, 415.
Scott: *Journ. of Hygiene*, 1926, 25, 398 and 406.
Duncan: *Ibid.*, 1924, 22, 402.
Bauer and McClintock: *Journ. Infect. Dis.*, 1929, 44, 292.
Perry and Tidy: Medical Research Council, Special Report Series, 24.

THE PRESENT POSITION OF THE VOLUNTARY BOARDER.*

BY

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WHILE our subject cannot claim to be one of any great scientific or clinical interest, it is certainly one of the very greatest practical importance. It is a social, legal, and medical problem which merits, and will repay, the fullest discussion.

As you probably all know, there are three classes of "mental" institutions in this country: the county or borough establishments for rate-supported patients, the privately owned "licensed houses," and the registered mental hospitals. In addition to the rate-aided patients for whom they primarily exist, many of the county asylums can, and do, admit paying patients at a low figure, but no patient can be admitted to these institutions unless he has been certified and a magistrate's order for his "deten-

tion" obtained. This, by the way, I regard as probably the greatest blot on our present lunacy administration.

The licensed houses and the registered hospitals may, and do, receive voluntary boarders. A voluntary boarder is a person who enters the institution on his own request, and is free to leave it at twenty-four hours' notice should he desire to do so. We shall require, however, to look into this apparently simple definition with a great deal of care. As it stands it is not quite complete. We must add the all-important statement that a voluntary boarder may only remain under care so long as he is definitely desirous of doing so and capable of expressing his desire. In other words, expressed willingness to remain is the sole criterion of a patient's suitability to stay in a mental hospital on a voluntary basis.

This is not the law, but it is the practice, and the only thing to be said in its favour is that it is at least an improvement on the law. I think that nowadays all of us, except perhaps the more hysterical of the reformers, realize that a very profound degree of mental disturbance is quite compatible with a wish to remain under care, but in practice this is not considered. So long as the patient wishes to stay in hospital he remains a voluntary boarder, and therefore a legally sane man, whatever his symptoms may be. Once let this willingness to remain—which, by the way, may itself be a "mental" symptom—falter, disappear, or fail to be expressed, and the patient must be certified as of unsound mind. No doubt his other symptoms warrant it, and no doubt his lack of expressed willingness to remain will not appear on the certificate, but it is the crucial point nevertheless. I know of no more pitiable *reductio ad absurdum* than this, that the deciding factor as to a patient's legal sanity or insanity is simply whether or not he can express a desire to remain in hospital.

Let us consider what it implies. First, of course, it takes for granted that the patient means what he says, and will not say what he does not mean. This, no doubt, is as it should be, because it must be remembered that his mental state, medically, has nothing to do with the matter. In law he is not a lunatic; he is not even an "alleged" lunatic. Therefore his statements on the subject of willingness to remain are to be taken as the considered utterances of a man enjoying all the rights and privileges of a healthy citizen, and are to be acted on as such utterances deserve.

Now if such a patient expresses a wish to go, it would seem obvious that he must be allowed to do so. Having entered a hospital by his own desire, he must be free to leave when he so chooses, and it is unthinkable that anyone should have the power to say him nay. That sounds well, but before approving it as obvious common sense let us remember that it would hardly sound so well in the case of, say, a fever hospital. What, in fact, does the superintendent of such an institution do when, as very frequently happens, a patient in an infectious state desires to leave? He detains him against his will; he is applauded for so doing as a conscientious public servant, and he would get into serious trouble if he acted otherwise.

Passing from that, which gives considerable food for thought, we come to the bigger and more important question of the patient who, having entered a mental hospital of his own accord, becomes, owing to illness, incapable of expressing his wishes one way or another. It is this problem of the non-volitional case which has always been the centre of controversy, and has led to the familiar criticism that if a patient, fearing an acute mental attack, enters a mental hospital he will not be permitted to remain when the very illness for which he sought care supervenes, should it render him incapable of expressing his wishes.

This is perfectly true. We must note, too, that the cause of the patient's lack of volition has nothing whatever to do with the case. During all my experience as a mental hospital physician I was fortunate in having very little difficulty in the matter we are discussing, but on one occasion I had to have a voluntary boarder certified simply and solely because the old lady had a cerebral haemorrhage. Should a patient suffering from the nervous and mental after-effects of, say, concussion seek admission, and subsequently lapse into unconsciousness, there is not the

* Read in opening a discussion in the Section of Neurology and Psychological Medicine at the Annual Meeting of the British Medical Association, Manchester, 1929.

faintest doubt that, as the law stands, he ought to be either certified or removed. And if this is so, how much more is it true of confused patients, of irritable excited patients, of patients who are swayed hither and thither by constantly varying delusional fancies, of neurasthenics who never know their own mind for two minutes at a time, and of melancholics whose entire loss of volition and querulous objection to deciding anything are among their fundamental symptoms? All such patients, and many others, says the law, must be removed or certified.

At this stage we may conveniently look for a moment in a more general way at the law as it affects voluntary boarders, though I shall waste no time on the easy but useless task of bewailing its inadequacies or condemning its absurdities. We have to deal with things as they are, and constructive suggestions are what we need.

Our Lunacy Act says very little indeed about voluntary boarders. So far as it concerns itself with them at all, it regards them purely from the point of view of the liberty of the subject. It looks on them as people who have taken the risk of jeopardizing their personal liberty and must be safeguarded from any unscrupulous persons who might attempt to take advantage of this fact. The conception of the voluntary boarder as a sick person seeking advice, treatment, and care in a medical establishment is utterly foreign to the Act. I suppose that, after all, this is natural enough. When the Act was framed the question of a man's health was regarded as being largely his private concern, affecting nobody but himself; but the question of his liberty was, and is, a matter of vital public interest, affecting the entire British Constitution.

You may be interested to know that at one time the privilege of entering a mental hospital as a voluntary boarder was restricted to those who had previously been patients under certificate. When, later, it was proposed to abolish this restriction, the Lunacy Commissioners raised many objections to any change being made, the two chief ones being that any extension of the privilege would diminish the accommodation for certified patients, and also that it would encourage evasion of the law because certifiable persons would avoid certification by entering as voluntary boarders. It is quite clear from the law as it stands that a person who can be certified cannot legally remain as a voluntary boarder, whether he wants to stay or not. As I have told you, this last provision is not now acted upon. If the strict letter of the law in this and many other respects had been followed I believe that the whole position would have become utterly impossible long ago.

The unenviable task of interpreting and administering the law as to voluntary boarders falls on the Board of Control, and, taking it all over, the result is such a reasonably broad and common-sense interpretation that all concerned have cause for thankfulness. We must remember in common fairness that a considerable section of the public are as intensely suspicious of the Board as they are of mental hospital superintendents. They are constantly on the look-out for the slightest straining of the strict letter of the law by that body, and the howl of "*Quis custodiet ipsos custodes?*" is never far from their lips. I have often thought that the best cure for such people would be for the Board to adhere rigidly to the provisions of the present law and nothing else for, say, a month. Then the reformers would indeed, like Shylock, "have justice, more than they desired." But the public would be the sufferers. As it is, they have little idea what they owe to the increasing intelligent co-operation between the Board of Control and medical superintendents in the humane but dangerous and thankless task of tempering the rigours of the law to the unfortunate patient and his relatives. The voluntary boarder has particular cause for gratitude. Among many other things, the Board of Control does all it properly can to avoid or postpone the certification or removal of the non-volitional case. When there is any ground for expecting return of volition in a reasonable period a week or two's grace is usually granted, particularly when, as almost always happens, the relatives urgently plead for it, and there is the moral certainty that the patient would wish to remain if he were in a condition to express any view at all.

Nevertheless, the non-volitional patient cannot legally remain uncertified in a mental hospital. That is the crux of the whole matter; it is the problem which has so far proved insoluble, and seems likely to remain so until the public view of mental illness and its treatment has been completely re-educated and the law entirely recast.

Let us try to grasp the situation exactly: it is one where clear thinking is difficult and rare. A "mental" case may not remain in a mental hospital uncertified if he is non-volitional, and he may not remain in a nursing home if he is certifiable. Now the peculiar difficulty of the situation lies in the fact that such a patient is very often precisely the "early, recoverable" case of which we hear so much. We shall never make real progress until we have done for ever with the fallacies, the insincerities, and the pious platitudes with which this subject has been surrounded. An "incipient" case is not necessarily a recoverable case, and still less is it necessarily a "mild" case. The "raving lunatic" is very often a highly recoverable case, and a man who has been hopelessly insane for ten years may be, and very often is, a far more pleasant companion than an "incipient" case of ten days' duration. Highly recoverable cases may frequently show not only a complete loss of volition, but also as acute, noisy, dangerous, anti-social, and utterly insane symptoms and conduct as one can imagine. It is hard to see what is gained by denying or ignoring these clinical facts. It does not hinder them from existing. All the pamphlets, papers, lectures, and councils in the country will do little for the "incipient case" about which they clamour if they ignore the essential and inevitable data of the problem, and treat elementary facts of mental disease as if they did not exist.

We must return, however, to the question of disposal of the non-volitional case. Assuming that care and treatment at home are impracticable, as they are in a majority of cases, there is no alternative to certification. There are, however, two other possibilities which might be legalized.

First, it might be made legal to retain such a patient in a nursing home, "free from the taint of lunacy." I mention this only to condemn it. To begin with, why should the nursing home be given authority to retain certifiable patients without certificate when such authority is withheld from the mental hospital? Further, and more important, such a course would deprive the patient of what is incomparably the best means of treatment for him. Obvious mild psychoneurotics who have the insight and ability to co-operate, and possess sufficient means, are probably best treated in one of the few admirable establishments where general management and occupational treatment are combined with expert and intensive psychotherapy. Apart from these, however, there is no form of disposal for mild or severe mental cases to compare for one moment, as regards efficiency, economy, and results, with residence in a modern mental hospital. I held that view when I was a medical superintendent. I hold it equally firmly and express it more readily now that I am no longer engaged in institutional work. I will add that, as a rule, the treatment, so-called, of a mental case of any severity whatever in an ordinary nursing home is one of the tragedies of medicine.

Secondly, it might be made legal to retain uncertified in the mental hospital a voluntary boarder who had become non-volitional. This is the ideal, but how it is to be contrived is hard to see. In the present state of public opinion I confess I can imagine no workable system of "safeguards" which would be likely to meet with general acceptance. Non-volitional and, indeed, actively objecting, patients are detained daily in every general hospital in the country, and the "safeguards" against a certifiable patient being detained illegally in a nursing home are precisely *nil*; but in the case of the mental hospital, where every patient is known to, and visited by, the Board of Control, and where every detail of his case is open to their inspection, the "wicked uncle" view still holds the field, to the exclusion of science, humanity, and common sense.

The best that the Royal Commission could suggest was an elaborate process of provisional certification. It was a clumsy sort of compromise which, I think, would have been unworkable, and in any case did not meet the difficulty, but at least it was a sincere effort. The public, by the

way, are not so entirely to blame as one might think. They say what they are taught. When we are told by our own profession that the question of a man's sanity or insanity is one for trial in a law court, just as is the question of his drunkenness or sobriety, I am inclined to feel not only that we shall never get our problem solved, but also that we do not deserve to.

As things are, however, there is no alternative to certification if the voluntary boarder who has become non-volitional is to remain. One practical difficulty immediately presents itself. The patient is certifiable; his relatives wish him to remain where he is, and are content that he be certified. Is it fair to proceed with this and retain him as a certified patient? A majority of the public tell you it is not, and though they might possibly condone it in a non-volitional case, they regard it as a gross breach of faith in the case of a patient who wishes to leave. The patient has to give twenty-four hours' notice of his intended departure, and, although it is perfectly legal, it seems distinctly unfair to use this period in trying to obtain authority to keep a patient who only came upon the condition that he might go when he liked. That, at least, is the way the public look at it, and on the whole I am disposed to agree, although this view ignores the medical aspect and the probability that certification is the best possible thing for the patient in the circumstances. Many mental hospitals go the length of refusing to keep as certified those who have been with them as voluntary boarders, and there is something in this as a gesture, though it is hard to see what principle is involved. Still, it is certainly better than the solemn farce of taking a patient round the town in a cab to two different doctors and a magistrate and bringing him back certified rather than have it said that he was certified on the premises.

It will be convenient at this stage to consider to what extent the voluntary boarder system, with all its drawbacks, is used by the public. It is used to a large and constantly increasing extent. The proportion of voluntary boarders in different hospitals varies somewhat, often in accordance with the tradition of the hospital and the outlook of the superintendent. I have not access at the moment to all the latest figures, but the two hospitals with any considerable admission rate which generally lead the way in this respect are the Bethlem Hospital in London and The Retreat, York. In the latter hospital over 60 per cent. of the admissions in 1928 were voluntary boarders, and I have no doubt that other hospitals had very comparable figures. Now, when seven out of every ten admissions to a hospital for mental diseases which does not pick and choose its cases, but takes everything that comes along, are upon a voluntary basis, there are only two possible conclusions: either certification is largely unnecessary or else it is so distasteful to the public that they will shun and avoid it by every means in their power.

Of course, the process of certification should not be necessary, but it will remain so until we have provided a more satisfactory alternative, and, in particular, until we have solved the problem of the non-volitional case. That it is utterly distasteful to both the lay and medical public there is not the slightest doubt, and it will not surprise me if between them they bring about the practical close of the era of the certified patient in a very short time, quite independently of any change in the law. What the effect of new legislation may be, if and when it comes, I do not know. What I do know is that a large majority of the public regard avoidance of certification as the first and greatest consideration in mental illness. This is, in many ways, a great pity. There is much to be said in favour of certification in many cases, even under the existing law, and most of the public horror of it is the result of ignorance and prejudice. A very able and experienced physician asked me recently why it was that a patient suffering from small-pox or scarlet fever is duly certified and deprived of his liberty as a matter of course without any special legal intervention, public outcry, or social stigma, when the very reverse was the case if it was a question of mental illness. At present we must leave that very pertinent question unanswered, and simply accept the fact that it is so.

People who are resolved to avoid certification of their relatives at all costs will naturally consult physicians who

can be relied upon not to advise it, whatever the nature of the case may be. This demand has, of course, been met by a supply of able and devoted ladies and gentlemen with every qualification to be of assistance except a practical training in, and experience of, clinical psychiatry. With their feet firmly—almost ostentatiously—planted on the solid and respectable rock of neurology on the one side, or psychology on the other, they can reach almost incredible distances into the troubled sea of nervous and mental disorder without getting their feet noticeably wet.

Three rather sad things are largely traceable to their activities. First, if the case becomes so acute or so obviously psychotic that mental hospital care becomes urgently necessary, the relatives are almost inevitably given the impression that the case is hopeless, that treatment has failed, and that all that remains is for the patient to be "put away," the mysterious and awful doom of "lunacy" having fallen upon him. Secondly, and arising out of the above, the most fantastically absurd and untrue ideas with regard to mental disorder, certification, and mental hospitals are of necessity absorbed by the public and perpetuated amongst them. Finally, and most serious of all, many patients are deprived—from the best motives—of what would be the ideal treatment for them.

The public horror is not merely of certification *per se*; it is even more of what they call the "asylum atmosphere." They could perhaps stand their relative being certified, but what they cannot bear is the thought of him "associating with lunatics." This is so well recognized that we need not go into it at length, though one is tempted to do so. On the very day I wrote these words I saw a patient sitting alone, silent, unoccupied, slowly dementing, and "tenderly neglected" in a comfortable room in a privately owned mental hospital because her relatives have insisted that she shall not in any circumstances "associate with lunatics." Much of the agony—there is no other word—through which the relatives of patients pass in this matter is the result of ignorance and prejudice alone. There are few things of which I should less like to feel guilty than of having—for any reason—done anything to perpetuate that ignorance or foster that prejudice.

This dread of "asylums," as apart from the mere process of certification, is, of course, what affects the intending voluntary boarder, though to a much less degree, strangely enough, than it does the relatives of the certified patient. The point I must go on to make, however, is that in either case a certain amount of this dread of "asylum atmosphere" is to some little extent well founded, though the public are far from realizing the real nature of the trouble. It is the old question of "grading" which is at the bottom of it all. The extraordinary variety in the symptoms and needs of the patients admitted to a mental hospital of any size, along with the constant dead weight of irrecoverable chronic cases, present a problem which needs—among many other things—almost unlimited space, staff, and money for its solution. Only those familiar with mental hospital work can appreciate the difficulties of the situation which is made the excuse for criticisms which are often peculiarly irritating, fallacious, and unjust. For some years I have been convinced that this difficulty is being met in the wrong way—namely, by keeping mild cases away from the mental hospital, which, with all its drawbacks, is, as I have said, infinitely the best place for them. It is more than that—it is the only place where they can obtain the understanding management, the expert treatment, and, above all, the skilled nursing care, which are their greatest needs.

I have long thought that we should begin at the other end, and remove to completely separate and independent branches of the mental hospital the chronic, unpleasant, and noisy cases. It would need more than two separate establishments to do the thing ideally, and of course the branches, though entirely separate, would have to be near enough for quick and easy interchange of patients. To my great delight a scheme of the kind is actually in preparation in London just now, the pioneers being the governors of St. Luke's Hospital. When completed, the reorganized St. Luke's will consist of three separate establishments, one in London and two near it—one of them for quiet, recent, co-operating patients; the second for

noisy and troublesome acute cases and irrecoverable chronic ones; and the third for convalescents. Best of all, there is a fourth branch, in some ways the main and central one—namely, an out-patient department and a ward for in-patients at a great general hospital, the Middlesex.

I mention this scheme not to discuss it, but to show what can be and is being done in the face of quite extraordinary difficulties. I am glad to think that it is one of the registered hospitals which has taken the lead in this way, and I hope that under its enlightened and far-seeing head, Dr. Gilmour, the new St. Luke's will have the success which it deserves.

I have felt the responsibility and the difficulty of preparing this paper very keenly. I have left unsaid a great deal that might well have been included in our subject, but the whole matter is such a far-reaching one that if discussion is to be fruitful we must limit its range.

I have therefore—here and there with reluctance—touched upon the points which seem to me most to need frank and courageous discussion. And I want our discussion to be fruitful. There is so much to do, and there are so many difficulties in the way. But it is to the general body of the profession that we may fairly look for help. There could be no better outlet for the organized activity of the profession and of this Association than a combined effort to bring just a little more science, a little broader humanity, a little more practical good sense, into our dealings with sufferers from the saddest of all human ills.

THE X-RAY TREATMENT OF WOUNDS.*

BY

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It is the experience of many of the older radiologists that the healing, not only of carcinomatous, sarcomatous, actinomycotic, venereal, tuberculous, and other ulcers, but also of old, neglected, sluggish, or badly healing wounds, can be hastened by the influence of x rays. This agrees with the experience of those authors who used the sun's rays, or powerful sources of artificial light, for the same purpose. It was the observation of the effect of light on an old wound, the result of a stab with a knife, which induced our distinguished colleague, Dr. Bernhard of St. Moritz, to introduce the sun's rays as a healing factor into therapy in the year 1902.

It is difficult to decide whether this beneficial influence is due to the stimulating effect of small doses of x rays on the functions and growth of the cells, or whether it is to be traced back to the elimination by x rays of an antagonistic factor which delays cicatrization. In my opinion, which is also shared by Professor Arzt and Dr. Fuhs, the question whether the increase in proliferation is caused by direct or indirect stimulation of the activity of the cells is of less importance, for all practical purposes, than the fact that undoubtedly small doses of x rays have a stimulating effect on badly healing wounds.

But it is not this subject, interesting and of practical importance though it certainly is, to which I wish to direct your consideration. I desire to solicit your interest for one particular indication for x rays, which would appear to be little appreciated in your country—the x-ray treatment of fresh and open wounds. As long ago as 1898 I noticed the beneficial influence of x rays on keloids and bad scars. In a later histological experiment on a very large keloidal scar, I observed that the hyperplasia of the connective tissue arose from the numerous young round cells and spindle cells clustered round the blood vessels. The idea at once occurred to me that it might be possible to prevent the formation of keloid by exposing to the destroying influence of x rays those groups of cells which, on account of their youth, are particularly sensitive. Since then, after complete excision of tumours in a number of people who showed a tendency to keloid formation, instead of stitching up the wounds or covering them with skin

grafts, I administered small doses of x rays to the open wounds, the bleeding of which had been stopped *lege artis*. The x-ray dose was administered immediately and repeated on several successive days; without exception very good results were obtained. As a consequence I did not hesitate to employ this method in other pathological conditions for which I considered it suitable; in this work I have enjoyed the valued collaboration of Professor H. Salzer.

The following conditions were treated: circumscribed patches of lupus vulgaris, epitheliomata, rodent ulcers, keloids, and pigmented naevi.

This method offers various advantages over other methods of treatment of lupus vulgaris and malignant new growths. When such pathological masses of tissue are excised the x rays do not have to destroy these tissues, a task which they cannot accomplish as quickly as a knife. Masses of tissue of varying thicknesses are removed, which would otherwise weaken the rays by absorbing them on their way to the base of the lesion. Thus the x-raying of the open wound after operation renders the operation more effective. If some traces of the disease are left in the wound, they will be attacked more intensively than when the wound is stitched up. If, in spite of excision and subsequent treatment with x rays, some remaining trace of the disease gives rise to a circumscribed recurrence, this may be removed easily and quickly by the same method. The thin delicate soft scar offers only a slight resistance to the breaking through of the new growth to the outside. This constitutes a very important advantage over large wounds which have been stitched or grafted. Such wounds often become so hard, thick, and oedematous that they offer insuperable obstacles to the breaking through of the infiltration which is growing beneath them, and which consequently takes the line of least resistance and spreads beneath the scar. In other words, a thick scar encourages the propagation of the disease in the body of the patient.

As the cosmetic results are excellent, the resulting scars being not inferior to those obtained with Finsen light, we used this method in a large pigmented naevus, in which excision with subsequent stitching or Thiersch grafting, would certainly not have given such a good cosmetic result as that which we obtained.

The method offers, in addition, in lupus vulgaris and malignant processes, the great advantage of shortening considerably the duration of treatment, especially that of the required x-ray treatment. For instance, in lupus vulgaris it dispenses with the frequent application of x rays, which would be necessary if the lesion were not previously excised, and we have all had experience of the dangers which may result from continued x-ray treatment. By using my method a patch of lupus vulgaris the size of the palm of the hand can be fully healed in six to eight weeks.

The application of this method has its limits, depending upon the localization and extent of the lesion; within these limits there still remains a wide scope for fruitful work.

Wounds in situations where the skin remains stretched are the most suitable for this kind of treatment. Near joints or folds, where the edges of the wounds approach one another whilst in movement, the resulting scars are only satisfactory if movement is eliminated by a firm bandage during the period of healing. Even a very extensive wound following excision is not an obstacle to the formation of a good scar. For instance, I saw a circular wound with a diameter of 10 cm. over the great trochanter, which resulted in a perfect scar. According to my experience the duration of healing of wounds after x rays is certainly not longer than it would be without x rays.

As a result of an experiment on an animal which I performed with Dr. Peach of Manchester during her stay in Vienna, we found that a fresh wound x-rayed with our therapeutic dose was healed a little earlier than an un-x-rayed wound of exactly the same area and depth, symmetrically situated in the same animal. This observation was recently confirmed by a communication from H. Suichi Fukase of the Holzknecht Laboratory.¹

Herr Glocker found that wounds healed more slowly after x rays; probably this was due to the dosage given.² The dose which we usually apply is a little higher than an

*A paper given by invitation at the Annual Meeting of the British Medical Association in Manchester, July, 1929.