

official, but that it should be accompanied by the recommendations of two doctors. The employment of two doctors in place of one would give it much more than double the guarantee of safety of the Certificate of Emergency, and it would not therefore be amiss to allow such an Order to hold good for a month. Copies of the documents would, of course, be sent at once to the Board of Control, which would, as at present, check irregularities of procedure and inquire into cases of doubt. At the end of a month, if the doctor having charge of the patient and having opportunity for close observation sent a third recommendation, the Provisional Treatment Order might on the strength of these three recommendations be extended to the full period of six months. Such a procedure would be simple and safe, it would avoid lay formalities and consequent delays, and in many cases it would with advantage take the place of the Emergency Order, of which it appears to be a logical development. The machinery here suggested is similar to the ordinary procedure for private patients of the 1845 Act, which did yeoman service for forty-four years, and for the retention of which Lord Shaftesbury with unerring insight and philanthropic zeal fought so hard against legal dogmatism but failed. It also resembles the procedure under the existing Irish Act.

## APPENDIX.

*Schedule (G). (20 & 21 Vict. Cap. 71. Scot. 1857.)*

I, *L. M—*, a Medical Person duly qualified in Terms of the Act (*specify this Act*), certify on Soul and Conscience, that *C. D—* (*name and design the patient*) is afflicted (*state the nature of the disease*), but that the malady is not confirmed, and that I consider it expedient with a view to his recovery, that he should be placed (*specify the house in which the patient is to be kept*) for a temporary residence of (*specify a time, not exceeding six months*).

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*Chronic Sepsis as a Cause of Mental Disorder.\** By WILLIAM HUNTER, C.B., LL.D., M.D.Edin., F.R.C.P., Consulting Physician to London Fever Hospital and to Charing Cross Hospital.

THE part played by sepsis in producing nervous and mental disorders of all degrees of severity and the degree to which these can be prevented, checked, or controlled by antiseptics are singularly opportune subjects for discussion on an occasion marking the

\* Being the opening paper of a discussion at the Annual Meeting held at Edinburgh, on July 20, 1927 (conjointly with the Section of Mental Diseases of the British Medical Association meeting).

centenary of the birth of Lister. We are not only commemorating past achievement, but inaugurating a new campaign against sepsis in one of the greatest domains of medical diseases—that which bears the ill-omened title of insanity.

It is the first time this subject of sepsis and antiseptics in relation to mental disorders has been before this Association. The types of mental disorders more especially concerned are those that bear the titles of dementia præcox, manic-depressive insanity, paranoid conditions, psycho-neurosis, and toxic insanities. These constitute the great proportion of the admissions into our mental hospitals—on an estimate kindly supplied me by our President: dementia præcox about 20%, manic-depressive insanity about 50%, paranoid conditions about 10%, psychoneurosis about 5%, and toxic insanities about 15%.

The sepsis with which medicine is concerned is that originally described by me in 1900 under the title of “oral sepsis,” and other forms of focal sepsis as a cause of medical diseases—namely, the sepsis in teeth, the tonsils, nasopharynx, nasal sinuses, stomach, intestine, colon, and sometimes elsewhere in the genito-urinary tract: “oral sepsis,” “tonsillar sepsis,” “nasal sepsis,” “septic gastritis,” “septic enteritis,” “septic colitis,” as I then termed the several conditions.

The call I then made (1900) on behalf of this sepsis was that:

“Sepsis in medicine is playing a greater part in producing medical diseases than it is now doing in surgical affections. A great field of prevention is opened up by the exercise especially of oral antiseptics against oral sepsis, the worst and parent source of most other forms of focal sepsis, especially that in the tonsils, stomach, intestine and colon—a field that can be worked in with the most surprisingly satisfactory results by the doctor, the surgeon, the throat, nose, ear, and eye specialist, and, most of all, the dental surgeon.”

This call included a special appeal for attention to this sepsis in the realm of nervous disorders, as presented in ordinary general practice, its neurites, its neurasthenias, its mental depressions, or its more severe so-called “nervous attacks” or “nervous breakdowns.”

One of the conditions I specially called attention to I termed “toxic neuritis.” Cases of this kind “open up a new field of inquiry” as regards the possible *rôle* of oral sepsis in causing nervous effects such as those I described under the title of “toxic neuritis” (1900).

Now, after twenty years, I am glad to think that the response to that call has come at last. It has come first of all (1919–23) from the American side at the hands of Dr. Cotton, the director of the New Jersey State Hospital, Trenton, who four years ago (1923) set forth very fully his results before the Royal Medico-Psychological

Society at its annual meeting, as fully detailed in the *Journal of Mental Science*, October, 1923. Dissatisfied after some fifteen years' experience of mental work with the results obtained, he began from 1918 onwards a desperate frontal attack with horse, foot and artillery—namely, medical recognition of the importance of oral and focal sepsis, surgical help for its removal, and bacteriological support for both—on the whole field of the sepsis presented by his cases (1400 in number), in the teeth, the tonsils, nasal sinuses, stomach, intestine and colon, and the genito-urinary tract, with the result of doubling the number of his discharges, and reducing the average stay in hospital from ten months to three months.

Since then the subject has received steadily increasing attention at the hands of English psychiatrists, and has been before them at three of their annual meetings as a subject of great interest and increasing importance in the treatment of the insane.

As might be expected, the very force of this attack on the problem of sepsis in mental diseases has produced equally strong counter-attacks, chiefly at the hands of American psychiatrists—especially the studies by Kopeloff, Kirby and Cheney (1922–23), of the New York State Psychiatric Institute. But the net result has been the satisfactory one that, however much they may agree that no importance is to be attached to focal sepsis as a cause of mental disorder, they are all “whole-heartedly in favour of eliminating all focal infection in psychotic patients.” That is a great advance on what has hitherto obtained.

#### SEPSIS IN MEDICINE.

If on the present occasion the President and officers of this Section have kindly invited general physicians and surgeons to take part in this discussion, it is owing to the circumstance that the past twenty-five years have furnished a large experience as to the part played by sepsis in general diseases other than nervous or mental—an experience now available in relation to the whole subject of mental disorders. The result of that experience may be best described in the words of others, since it was first set forth by me before this Association at its Oxford meeting in 1904, and so fully confirmed by many others, especially William Willcox and Chalmers Watson in this country; Frank Billings, Lewellys Barker, and Charles Mayo in America.

“One of the great advances in medicine of the past twenty years. . . . The effects of oral sepsis have been worked out, and prove to be so wide-spread, so multiple, and frequently so grave as to make us ashamed of our previous blindness to a common source of blood infection staring us in the face all those years. . . . An addition to our knowledge of the first magnitude.”—Dr. Mitchell Bruce, Address in Medicine, British Medical Association, 1910.

“No one circumstance in the last fifteen years that has so changed the aspect

of the practice of medicine as the doctrine of focal sepsis."—Prof. Thayer, Johns Hopkins University, 1914.

"The most interesting chapter in modern medical history, profoundly affecting medical and dental practice, epoch-making in its effects."—American dental literature.

"A profound and permanent influence on general medicine, rendering Lister's hypothesis which governs the practice of surgery at least of equal importance in relation to medicine. Infection in medicine is responsible for a vast number of diseases—a fact that has received far less attention than it ought to have had. . . . The immediate ravages of oral sepsis may prove serious enough, but the remote complications, seemingly so unrelated to their true cause, are a grave menace both to health and life."—Sir Berkeley Moynihan, 1927.

These appraisements may serve to indicate at once the chief site (the teeth), the apparently negligible character, but nevertheless the actual supreme importance of the foci of sepsis with which medicine as distinct from surgery is specially concerned; with which also, however, the surgeon has learnt to be equally concerned as a great potential and actual source of much of the septic infection in his surgical cases.

The sepsis with which the surgeon has been concerned is something obvious, manifested by recognizable effects such as inflammation, suppuration, death of tissue, fever and septicæmia—common effects producible by a large range of organisms, but chiefly those of the staphylococcal and streptococcal groups, or, in the case of the alimentary tract, the *B. coli* group. But he is not specially interested in the character of the organisms; his whole concern is that no organisms of any kind invade his wounds in the course of his operations.

But the features of the sepsis operating in medicine are of a different and more complex character. Its foci are small, hidden, chronic, and cause generally no local effects drawing attention to themselves. The organisms concerned are mostly of the same character, but the predominant one is the streptococcus. These are not of one, but of many strains—sixteen or more. Their characters are represented, not by their cultural features or by their behaviour towards sugars, but by the different effects they produce in the different systems or tissues of the body—in short, by their selective action on the different systems of the body.

Rosenow (1914–16) has obtained remarkable results in this relation. Strains isolated from the mouth and tonsils of patients suffering from particular diseases—rheumatism, myalgia, arthritis, nervous diseases, such as paralysis—were found to have a remarkable specificity in their action; those from rheumatic cases producing arthritis deformans, arthritis and myositis; those from ulcers of the stomach showing a marked affinity for the mucous membrane of the stomach and duodenum; those from the gall-bladder producing cholecystitis in the animals into which they were

injected. Most interesting of all was the specificity and selective action of strains isolated from the mouth and tonsils in various nervous diseases, such strains being always recovered with special frequency from the class of nervous tissue affected by the disease.

These studies of Rosenow, confirmed by others, appear to have all the elements of a romance in revealing this extraordinary elective specificity in the action of different strains of streptococci. But the results are only in accord with the actual clinical facts observed in disease—namely, the extraordinary variety of ill-effects associated with conditions of oral sepsis and other forms of focal sepsis, and the equally remarkable effect which the removal of such foci has in arresting, controlling or entirely banishing the ill-effects presented in the case.

Among the chief and most common of such ill-effects are the neurotoxic effects of sepsis presented in mental disorders, as illustrations of which I now describe the two following cases:

#### SEPSIS IN MENTAL DISORDERS.

Just as my whole original thesis of oral sepsis as a cause of disease arose out of the study and record of one single case of pernicious anæmia in 1890, and was driven home by the description of one case of "septic gastritis" (1900), so now, in the case of mental disorders and their relation to oral and focal sepsis, the relation may best be illustrated by the following case recorded by Dr. Cotton:

A single woman, aged 55; father died of melancholia, aged 64, mother of paralysis at 80.

Her mental trouble followed the death of her mother in August, 1916; she became excited, talkative, and in September was much depressed, agitated and self-accusatory.

Admitted to hospital in October, 1916. It was noted at the time that her upper teeth were missing, and that her lower teeth were badly decayed. But nothing was done for her, and she was transferred to the chronic ward, where she remained for nearly two years, till 1918.

In September, 1918, eleven bad teeth were extracted. She improved rapidly during the next few weeks.

On November 9, 1918, she was discharged as recovered and has remained perfectly well ever since.

In this case, as Dr. Cotton points out, the neglect to remove the bad septic teeth on admission, although their presence was noted, was responsible for her residence of two years in the hospital, for there seemed to be no other infection or any other physical disturbance except the infected teeth. As he also comments, the hereditary taint in the patient's history (father dying of melancholia at the age of 64) did not affect the recovery of the patient. Lastly, and most interesting of all, she recovered, and was fit to

be discharged within two months from the time of the removal of her infected teeth.

By itself this case might be regarded as an exceptional one in which merely by coincidence recovery happened to follow in a few weeks the removal of some septic teeth. But taken in conjunction with the evidence given above as to the part taken by similar sepsis in producing all sorts of medical ailments and conditions, such as anæmia, rheumatism, etc., a case of this kind would alone, in my opinion, serve to arrest the attention of everyone concerned with mental disorders. The case may be regarded as of definite historical interest: in the date of its first admission into hospital (1916), when, as Dr. Cotton describes, his interest in oral sepsis and its possible effects had not been aroused; his observations of the septic condition of the teeth without any action on his part; the action he took two years later (in 1918), when his belief in the importance of sepsis and its removal was strengthened; and lastly, the remarkable and immediate recovery that followed in a few weeks' time.

All the usual ætiological factors to which importance is attached in mental disorders were present in the case: the death of the patient's father from melancholia (the *heredity factor*); the onset of her trouble after the death of her mother (the *psychogenic factor*, to which from the point of view of psychology it has hitherto been customary to attach an almost exclusive importance in explaining mental disorders). Each of these factors might be regarded, singly or combined, as accounting for the patient's mental breakdown. Neither of them could be altered by any measure of treatment, and two years of hospital treatment in the best surroundings had failed to alter the psychology of the case. Nevertheless, what all other measures failed to effect was effected in a few weeks' time by the removal of what might well seem to be the most unimportant and most uninteresting feature of her trouble—the removal of eleven septic teeth.

In reality the factor producing her mental trouble was not her hereditary history, nor yet the mental anxiety following the death of her mother, both of which might in some degree predispose her to some mental instability, but the presence and toxic action of a severe though apparently negligible septic infection arising from the teeth. On removal of these the whole mental cloud was lifted from her. Her psychosis was, in short, a "septic psychosis," as I would now term it. Fortunately in her case these seem to have been the only septic foci present. If other septic foci had been present in the tonsils or nasal sinuses, or in the ears, or in the stomach, intestines, or colon, or cervix, as is often the case, her recovery might well have been neither so sudden nor permanent. Each of these



would have called for removal, or for appropriate measures of treatment as far as possible.

Another case from the same source, but from a later period (1921), illustrates the result of recognizing and removing all septic foci immediately on admission :

A girl, aged 17, admitted March 21, 1921. Paternal cousin insane (hereditary factor). Onset of trouble one month before admission, ostensible cause given being a love affair (psychogenic factor).

*Mental features.*—Violent, excited, destructive, breaking windows and furniture. On admission markedly dishevelled in appearance, irrelevant, and volunteered the information that her teeth hurt her. Teeth and gums in bad condition and tonsils also infected.

For a month after admission she continued in an excited condition, destructive to furniture, loud, noisy, and very impulsive, untidy, paying no attention to herself, passing excretions unnoticed into the bed ; conversation irrelevant and much confused ; hallucinations of sight ; refused food, had to be fed, and to be secluded in a single private room, so excited and non-co-operative that X-ray photographs could not be taken of her teeth.

Nine days after admission (March 30) her tonsils were removed, without any effect on the mental condition. On April 19, about a month after admission, the resident dentist diagnosed impacted third molars, and the four were extracted under a general anæsthetic. She slept well, and next morning asked the dental surgeon to come in and see her. This was the first relevant observation she had made since she had come into the hospital. On the same day she asked for permission to go to the bathroom and look after herself. There was a marked change in her conduct ; her conversation became quiet and fairly relevant. On May 9 she voluntarily made the remark that " since the extraction of my back teeth I have felt entirely different," and she realized that from that time her improvement continued.

On May 16 she was able to give a very clear account of herself. Her mental state at this date showed no evidence of confusion ; her memory was good for recent and remote events, except for the first three weeks of her residence in hospital ; sight and judgment were perfect ; she realized that she had had a serious mental attack.

She was discharged on June 21, three months after admission, although she had practically recovered after her impacted and infected molars were extracted, one month after admission.

This case illustrates, according to its recorder, the effect of impacted third molars in producing these confused mental states which so closely resemble dementia præcox. For such teeth are always, in his experience, found to be infected. It shows how the removal of some particular focus of infection, such as the tonsils in this case, may fail to improve the mental condition, and the necessity in such an eventuality for seeking for other possible foci—in this case the impacted teeth. It also indicates the difficulties presented to the full investigation of patients owing to their excited state, and their refusal to allow any examination of their mouths or throats, radiographically or otherwise.

The problem is whether to wait for weeks, possibly months, till the violence of the mental symptoms subsides ; or, on the other hand, to face what appears to be the risks, and carry out operations such as dental extractions, while the patient is still excited.

Every case of this kind must be considered on its own peculiar

features of urgency and severity. It is a matter which specially requires the judgment of the physician in charge of the case. I may give my own experience that any such apparent risks can be safely run.

The existence and possible importance of impacted and unerupted teeth in mental cases, here noted by Dr. Cotton, are, in my judgment, observations of interest in revealing the earlier dental history of such cases. Thus in 120 cases recorded by Kopeloff and his fellow workers (1923), I find that 15 cases (or 1 in 8) showed 49 such teeth—an average of 3 such teeth to each case. If such teeth become infected, as in cases of long-standing and severe sepsis they are most likely to be, the neurotoxic action of such sepsis enclosed in the alveolus of the jaws is likely to be very severe, as in the case above recorded.

The existence of such teeth in 1 in 8 cases of dementia præcox and manic-depressive insanity emphasizes, in my opinion, the importance of the earlier dental history of all cases of this character, especially in young people and young adolescents. I have had cases in which I have been able to trace a continual history of severe dental infection from the time of dentition at the age of 2 onwards.

In my judgment the dental history and the high degree of sepsis present in the last-mentioned case would probably be found, if fully investigated, to represent approximately the dental history and degrees of sepsis of most cases of the severe and prognostically grave mental disorders affecting juveniles or young adolescents. I draw special attention to the matter as one worthy of investigation and inquiry in every case of this character.

#### SEPTIC PSYCHOSIS.

If, as I am satisfied from my own clinical experience as a physician is the case, this wide-spread septic infection is also in particular cases causing wide-spread and various psychotic effects, the title from now onwards that would, in my judgment, best connote this form of psychosis would be the one I would now suggest of "septic psychosis."

This commonest form of psychosis, produced by long-standing chronic septic infection, exists sometimes alone, but more frequently along with and complicating other forms of psychosis, intensifying and aggravating the more special mental features belonging to these latter psychoses. The extent to which it is present in any case can only be determined by removing it, and the best hope that any psychotic patient can have is that it may prove to be largely, or possibly entirely, of the nature of a septic psychosis, and therefore one which may possibly be cured by the removal of the septic foci underlying it.



The term "septic" here given to this psychosis accurately connotes the ætiological factor underlying it, whether present as a principal or as a contributory factor in mental disturbances. The title will I hope facilitate its future study.

In dealing with it let me put in one plea. Do not let it go forth that sepsis is the cause of all forms of insanity. That is the sort of statement that will only serve to put the clock back. Let us be content to know on new evidence, that chronic sepsis is undoubtedly capable of producing very marked psychotic disturbances, and that a new and more hopeful era has been opened up for the prevention, amelioration, or possible arrest of various mental disturbances and disorders by surgical removal of the sepsis which so commonly besets the mental patient.

As regards the possible importance of this "septic psychosis" in psychiatry, perhaps the most judicial opinion is that pronounced by Dr. Adolf Meyer, Professor of Psychiatry in the Johns Hopkins University.

The evaluation of focal infections is an outstanding contribution of twentieth century medicine. If means could be made available to carry out the removal of these focal infections, psychiatry would make another large contribution of importance far beyond its own special sphere of mental hygiene, and relieve a group of patients of one of the insidious influences sapping humanity, thus offering a free field to work with the many other features which are bound to play a rôle.

#### INCIDENCE AND SITES OF FOCAL SEPSIS.

The incidence and sites of the focal sepsis found in mental disorders are well brought out in the table on p. 558 of 200 cases treated successfully by Dr. Cotton, and found afterwards on visit to have remained well.

In his experience in the case of men the teeth were found infected in all cases, and in every form of psychosis, the tonsils in 76% of cases, the stomach in 83% (all of them requiring treatment with vaccines), the seminal vesicles in 2%, and serious lesions of the colon in 10%. In the case of women, the teeth were found septic in all cases, the tonsils in 73%, the stomach in 76% (requiring treatment with vaccines in 71%), the cervix in 80%, and serious lesions of the colon in about 30% of the cases.

As regards the incidence in different forms of psychosis, there was little or no difference between them in the case of males, but in the case of women the colon was operated on in 13% of cases, as compared with only 1% in males, 9 of the cases being among 66 cases of manic-depressive insanity.

*Table showing Incidence and Sites of Focal Sepsis treated successfully in 100 Male and 100 Female Patients.  
(Dr. Cotton.)*

Mental disorder.	Total.		Teeth.		Tonsils.		Gastric.		Vaccine.		Vesiculotomy.		Cervix.		Colon.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Manic-depressive insanity . . .	49	66	49	66	39	47	41	50	41	46	1	8	—	9	—	—
Dementia præcox . . .	18	8	18	8	13	7	13	7	13	7	—	5	—	2	—	—
Paranoid condition . . .	15	9	15	9	11	6	14	5	14	5	—	1	1	1	1	1
Psycho-neurosis . . .	7	10	7	10	7	6	6	7	6	6	1	2	—	—	—	—
Toxic psychosis . . .	11	7	11	7	6	7	9	7	10	7	—	4	—	1	—	—
<b>Totals . . .</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>76</b>	<b>73</b>	<b>83</b>	<b>76</b>	<b>84</b>	<b>71</b>	<b>2</b>	<b>20</b>	<b>1</b>	<b>13</b>	<b>1</b>	<b>13</b>

Interesting data regarding the incidence and seats of focal sepsis are also supplied by Dr. Graves, the Director of Rubery Hill and Hollymoor Mental Hospitals of the Birmingham Corporation, the first of the hospitals in this country to supply data of this character:

No. of cases.	Teeth.	Tonsils.	Nose.	Ear.	Cervix.
296	230	—	—	—	—
258	193	—	—	—	—
123	—	48	18	39	—
249	—	104	20	106	—
139	—	—	—	—	99

These figures yield the following incidence of septic foci in different seats:

Oral sepsis . . . . .	76%
Tonsillar sepsis . . . . .	40%
Nasal sinusitis . . . . .	10%
Ear . . . . .	39%
Cervix uteri . . . . .	71%

The figures show the wide-spread character of the sepsis present in the mental patient.

The percentage incidences for the teeth and tonsils (76 and 40) are considerably lower than those found by Dr. Cotton (100 and 76) respectively; but they are interesting in confirming the high incidence of cervix infection—namely, in 71% of women. They draw attention to the incidence of nasal sinusitis in at least 10% of cases, but most of all to the high incidence of ear sepsis in 39% of cases.

The relative importance of the various seats of focal sepsis, I would point out, is not dependent on the relative incidence of such infection in the various seats—teeth, tonsils, nose, cervix, etc.; it is determined far more by the amount of sepsis which may be harboured in each seat, and by the conditions favouring its chronicity and by its virulence. In this relation oral sepsis (dental sepsis) is by far the more important, for the number of foci which the teeth may harbour depends not only on the number of septic teeth which may be present, but also on the number of septic sockets connected with these teeth. Thus the presence of four septic molars each with three roots means the existence of twelve septic foci, and may thus be the equivalent of eight incisors and four canines which have only one root each.

I have been much impressed by the degree of infection in the sockets of infected teeth in many cases, cultures which I myself have taken with extremest precautions from the apices of the teeth immediately on their withdrawal, and planted on sloped agar tubes,

growing hundreds of colonies of streptococci sometimes in almost pure culture (90%).

The degree of oral sepsis cannot be expressed in terms of "infected teeth" as some observers do (Kopeloff, 1923). It must have regard to all the other conditions present—of septic gingivitis, tartar deposit, ulceration and pocketing, pyorrhœa; of periodontitis and osteitis shown by recession of gums or looseness of teeth, or by thickening of alveolar margins; number of carious or necrosed teeth; number of devitalized teeth (nerves destroyed); number of teeth with gold caps or porcelain crowns, gold bridges (a very potent form of sepsis, especially in regard to its neurotoxic effects); and finally, to conditions revealed by radiographs of apical abscesses and granulomata, of buried roots, of impacted or unerupted teeth.

When regard is had to all these conditions, the ordinary degrees of oral sepsis usually found—slight, moderate or severe (1°, 2°, 3°), as I am accustomed to designate them—will often, in my experience, be found to be so severe (especially in mental cases) that it can only be expressed by degrees varying from 5° up to 10°.

The amount of infection created by all these various conditions is far greater than anything ever found in connection with infected tonsils; and also far more virulent, since it is all in connection with bone tissue, which always enhances the virulence of a septic infection.

It is this latter circumstance that adds to the virulence of nasal sinusitis and ear infection, which also can be very severe in mental cases.

#### NEW ERA OF ANTISEPSIS IN MENTAL DISORDERS.

In the foregoing I have endeavoured to give a glimpse of the character of this subject of sepsis in relation to mental disorders from the point of view of a general physician well acquainted with the characters and potentialities of the sepsis concerned, rather than from that of the psychiatrist, to whom many other questions of interest arise.

The same applies to matters of surgical interest arising out of this new aspect of mental disorders: the work required from the dental surgeon, from the radiographer, from the throat, nose and ear surgeon, from the abdominal surgeon in connection with the surgery of the intestine and colon, from the genito-urinary surgeon in connection with the prostate and seminal vesicles, and lastly from the gynæcological surgeon. I see no reason why the help of the surgeon in dealing with conditions of sepsis presented in mental patients should not be warmly welcomed, in the hope of restoring sanity to a disordered mind, just as readily as it is placed at the

disposal of any other who by some accident or other might require such help.

Discovery of the part played by sepsis in mental disorders introduces an entirely new era into the whole subject of the nature of many of these disorders, and the possibility of controlling and preventing them. They make clear, in my judgment, that it is septic infection that underlies many mental disturbances hitherto regarded as denoting or foreshadowing permanent damage, or contributes to the severity of such disorders even when permanent damage has been done.

This "septic psychosis"—as I would now term it—is produced by the action of toxins derived from small and apparently insignificant septic foci, chiefly in the teeth and tonsils and elsewhere. On the removal of these the whole mental disturbance may be profoundly affected, and may in many cases be made to disappear. By the removal of such septic foci with the attendant psychosis the control of mental disorder and insanity in many of its forms and manifestations is rendered possible to a degree never before attainable. The degree of disorder may be of such a character and duration—for example, that presented in dementia præcox, or in severe manic-depressive insanity—as to suggest permanent damage to the higher brain centres, and to appear, therefore, incapable of being influenced by the removal of slight septic foci. But the clinical facts show that this is not the case, and the extent to which the degree of sepsis present in each case is affecting the character and degree of the mental features of the case in causing a "septic psychosis" can only be determined by the removal of that sepsis.

The removal of the sepsis in all cases of mental disorder and insanity is therefore called for as a matter of urgency and as a first measure of treatment in every case. The amount of chronic sepsis present among the mental patients, who to the number of 133,000 and more occupy the mental hospitals and asylums of this country, is far greater than that to be found in any other group of inmates of our hospitals. The removal of that sepsis in their case is imperative to a degree, as the first and most important measure of treatment applied to them. For in their case the evidence already available makes it clear that however much ordinary people in health may be able to resist, and do successfully resist, the deleterious action of the varying degrees of similar sepsis which they carry, the sufferer from mental disorder *cannot afford to have any such sepsis unregarded*. He is playing for the highest stakes—the preservation of his brain-power and his sanity. He can run no risks. And, inasmuch as in his case the control of his illness is out of his hands, in his own interests, it is all the more incumbent that every possible measure

of treatment should be available and should be applied for his benefit.

Each mental hospital should therefore be as fully and as well equipped for surgical work as it has hitherto been for medical or nursing care. Its staff should include visiting surgeons concerned with dental, throat, nose and ear, abdominal and gynæcological surgery. All the public authorities responsible for our magnificent mental hospitals will gladly provide that every mental hospital under their charge should, so far as they are not already equipped, be forthwith supplied with every arrangement for surgical work. This involves the provision of a fully equipped dental department and surgical theatre for every mental hospital, with visiting staff of a dental surgeon, a general surgeon, and throat, nose and ear specialists, with the necessary radiographic and bacteriological departments. In making this provision they will, I feel sure, have the whole-hearted support of the public, rightly concerned for their mentally afflicted more than for any other class of sufferers.

The possible standard of increased relief which this class of sufferer may receive is that their chances of recovery may be doubled, that the duration of the stay in hospital may be materially reduced, and that on discharge the chances of remaining well, both physically and mentally, will be greatly improved by the removal of the sepsis if that *removal is carried out at the first onset of the trouble before permanent damage is done.*

But it is in the realm of prevention that this new application of antiseptics will find its greatest triumphs—namely, the cutting short of all sorts and degrees of nervous and mental disturbances that in most cases precede and herald the onset of the graver mental disorders.

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(For discussion, *vide* p. 717.)

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*Chronic Sepsis and Mental Disorder.\** By T. C. GRAVES, B.Sc., M.D., F.R.C.S., Chief Medical Officer, Birmingham Mental Hospitals Committee.

THIS subject should not be discussed, least of all in Scotland, without a tribute being paid to the work of Dr. Lewis Bruce, of Murthly, whose book, *Studies in Clinical Psychiatry*, published twenty-one years ago, is devoted to a consideration of the toxæmic causation of mental disorder.

At the present time what more fundamental conception can be advanced than is contained in the following paragraph from his book: “The bacterial toxæmias of insanity are chronic, and indicate that the real disease lies deeper than the mere toxæmia, the disease being rather a failure of the patient to form antibodies.”

The persistence of chronic infections in which there is an eventual failure of the local tissues to respond to the invasions of organisms and their toxic products, *i.e.*, in which the local tissues become poisoned, undoubtedly has a profound effect upon the mental processes of the individual.

The study of one case may be more valuable than striking an average over a large number of cases, since each is a problem by itself. I would therefore ask your consideration of the details of a case which illustrate a method of stimulating a favourable reaction to chronic toxæmia by non-specific protein therapy and surgical treatment of the septic foci.

Female, single, born December 5, 1906; fifth and youngest child, born when mother aged 44. Great grandmother suffered from “nerves.” Mother had

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\* A paper read at the Annual Meeting held at Edinburgh, July 20, 1927.