doing their ordinary job with only mild backache than in any other. In two, a brace was tried and given up. Four of them expressed the conviction that they were enabled to work because of this support. The spondylolisthesis cases were all enabled to work because of the brace. The postural strain cases have definitely been improved by their special exercises; two of these are perfectly fit because of the brace. The cases of infection, bone injury, and osteoarthritis, reveal nothing of significance in regard to this study.

### Conclusions

1. The labourer with chronic low back pain, with or without sciatica, has a serious disability. When a protruded lumbar intervertebral disc can be diagnosed, operation may not necessarily restore him to normal activity.

2. The diagnosis is difficult because of the varying clinical picture. The patient with recurring traumatic strain may be in the early stages of a disc lesion.

3. In spite of the unpopularity of the lumbosacral brace this study indicates that many cases of backache are improved by its use. In particular, in those cases who have had a laminectomy without subsequent fusion, and who have residual symptoms referable to the back, the brace may afford considerable relief.

4. A study of the nature of the trauma resulting in chronic back pain suggests that the best treatment may well be some form of prevention. The human species has a constitutional weakness at the lumbo-sacral junction. In order to compensate for this deficiency, a well planned and purposeful program of postural training is required. The lower part of the spinal column can thereby be protected against the excessive strain to which it is otherwise exposed. Perhaps this special training may form a part of the nation-wide program of physical fitness. Certainly it should be a very important feature in military training, and no soldier should be made to tackle the obstacle course without first learning how to protect his spine in falling and jumping: nor should he be allowed to march with a pack on his back until he has learned, by habit, to carry his body in the proper manner.

I am convinced that if industrial firms were to provide this training for their workmen, they would find a considerable saving from the grief that, in many instances, follows intervertebral unneighbourliness.

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### Résumé

La lombalgie, avec ou sans sciatique, constitue un sérieux handicap. Dans les cas de hernie discale il faut savoir que l'opération ne permet pas toujours le retour au travail antérieur. Le diagnostic clinique de hernie discale est parfois assez difficile. Le support lombo-sacré,—ceinture ou corset—, rend souvent de grands services, même chez les sujets qui ont subi la laminectomie. De l'étude des traumatismes lombo-sacrés il est permis de conclure que beaucoup peut être accompli dans la voie de la prévention, par example, par des exercices rationnels qui augmentent la résistance vertébrale et permettent une meilleure utilisation d'autres segments musculaires. Ces méthodes prophylactiques devraient être appliquées à l'entraînement des militaires.

Jean Saucier

## ELECTRIC SHOCK THERAPY IN A PRIVATE PSYCHIATRIC HOSPITAL*

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THE literature on the subject of shock therapy is already so voluminous that one feels called upon to defend any attempt to add anything more. We felt that we might be justified in presenting this report of our results with electric shock therapy as this hospital holds a somewhat unique position in this country, there being no other private psychiatric hospital of comparable size in Canada. While the vast majority of our patients differ only in their social and economic backgrounds from those treated in public mental hospitals, we do admit a larger percentage of the milder cases especially in the psychoneurotic group. This article deals with our experience in treating 300 consecutive cases of all types over a period of approximately four years. All patients treated in this hospital with electro-shock therapy during that period are included in the series.

It seems unnecessary to dwell on our method of selection of cases for this form of therapy as it would appear to be basically the same as in other hospitals with the possible exception of the standard of physical fitness qualifying the patient to undergo shock. At the outset, we proceeded with caution and while we have

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lowered the barriers in keeping with the general trend, we still reject cases showing evidence of coronary artery disease or circulatory failure and also those with definite evidence of cerebral arteriosclerosis. We do not feel that age in itself is any contraindication to the treatment but our series included only six patients who were over 70 years of age and 14 between the ages of 60 and 70. It is our policy to look upon electro-shock as merely an elective procedure and not one which is to be undertaken lightly. It is not used routinely in any type of case but is given only when it may be expected materially to shorten the duration of the illness or alleviate symptoms which are unusually severe.

*Immediate results.*—An attempt has been made to express our results in tabular form. The appraisal of the patients' condition for Table I was made three weeks after the last shock treatment had been administered. This period is nine days shorter than that suggested by Alexander,[1] but in our experience few patients have relapsed between the 21st and 30th day after the completion of treatment. Most of our early relapses have been in the first or second week. Improvement which took place beyond this 21-day period, we do not attribute to shock therapy. An attempt should be made to define what we mean by "greatly improved" and "slightly improved". It goes without saying that a patient classed as "recovered" is not only well enough to return home but is free from any disability of a psychiatric nature. Those patients classed as "greatly improved" are also able to return home but still show residual symptoms. Of the patients classed as "slightly improved" there was definite evidence of benefit at the end of three weeks following the last shock but many of these patients were still in hospital. However, our records show that many of them continued to improve and were able to lead a reasonably normal life at home after a further period of hospital care. In many cases of this class, the home condition, rather than the benefit produced by shock, was the determining factor in deciding on the discharge of the patient.

Taking all classes of patients as a whole, the results can briefly be summarized by saying that one-third was recovered, one-third greatly improved, one-sixth slightly improved and one-sixth unimproved. Or, to simplify it still further the whole number could be divided into two groups instead of four, putting those recovered and greatly improved into one class which might be labelled as "successful results". This group constitutes roughly two-thirds of the whole, with the remaining third being classed as "unfavourable results". As is generally found, the best results were obtained in patients suffering from the depressed phase of manic depressive psychosis and the poorest results in schizophrenia. As there was a relatively small number of cases of schizophrenia in our series, we did not sub-divide them. However, our results pretty well parallel those of other observers[2] in that the best results were obtained in patients of the catatonic type, the paranoid type ranked second and little if any benefit was produced in those of the simple or hebephrenic types.

Likewise, we did not sub-classify the psychoneurotics except to show the cases of reactive depression separately as they do respond much better to shock than psychoneurotics as a whole. We found, however, that many patients in an anxiety state also responded well to this form

TABLE I.
RESULTS OF SHOCK TREATMENT IN SERIES OF 300 CASES, 219 FEMALES, 81 MALES
(Evaluated 21 days after last shock)

| | *Total No. of cases* | *Recovered* | *Greatly improved* | *Slightly improved* | *Unimproved* |
|---|---|---|---|---|---|
| Manic depressive psychosis, depressed phase ..... | 98 | 46 (47.0%) | 33 (34.0%) | 13 (13.0%) | 6 (6.0%) |
| Manic depressive psychosis, excited phase ..... | 37 | 16 (43.0%) | 15 (41.0%) | 3 (8.0%) | 3 (8.0%) |
| Involutional melancholia . | 18 | 6 (33.0%) | 6 (33.0%) | 2 (11.0%) | 4 (23.0%) |
| Reactive depression ..... | 31 | 11 (35.5%) | 17 (55.0%) | 2 (6.5%) | 1 (3.0%) |
| Other psychoneuroses .... | 34 | 8 (23.5%) | 6 (17.5%) | 12 (35.5%) | 8 (23.5%) |
| Schizophrenia ..... | 60 | 9 (15.0%) | 16 (26.0%) | 14 (24.0%) | 21 (35.0%) |
| Schizo-affective ..... | 13 | 4 (31.0%) | 3 (23.0%) | 3 (23.0%) | 3 (23.0%) |
| Miscellaneous ..... | 9 | 1 (11.0%) | 2 (22.0%) | 2 (22.0%) | 4 (45.0%) |
| Total ..... | 300 | 101 (34.0%) | 98 (33.0%) | 51 (17.0%) | 50 (16.0%) |

of therapy. It will be noted that our series contains quite a large number of psychoneurotics and we feel that our results indicate that the use of shock treatment in these cases is well worth while. Taking our psychoneurotics as a whole, 42 out of a total of 65 were classed as "recovered" or "greatly improved" while only 9 were "unimproved". We are in accord with the conclusions of Hamilton[3] who reported a higher recovery rate and a shorter hospital stay in the case of psychoneurotics when electric shock was used in addition to other forms of hospital treatment.

The "miscellaneous" group consisted of 3 patients suffering from a paranoidal condition, 3 with alcoholic hallucinosis, 1 case of G.P.I., 1 case of depression associated with disseminated sclerosis and one case of post-encephalitic psychosis. Two of the cases of hallucinosis were acute and responded well to treatment, one being "recovered" and the other "greatly improved". One of the paranoids also was "greatly improved". One case of chronic hallucinosis showed no improvement.

*Number of shocks.* — Table II shows the average number of shocks administered to the various diagnostic types. It is noted that a higher number of treatments was given to schizophrenics than to any other class of patients and also that the patients who responded well received a smaller number of treatments than those who responded poorly or not at all. In cases where patients were given two or more separate series of treatments, each series was considered as a separate undertaking. The smallest number of shocks given to any of our patients was three and this was the number administered to six patients. Thirteen patients received a total of four shocks each.

Rarely did the number of shocks given in one continuous series exceed 15, but in a few patients who showed a tendency to relapse, the total was much higher. One patient still under treatment has had 36 shocks in a period of seven months. The highest number of shocks administered to any one patient was 48 in a period of eight months. This consisted of two separate series of 12 and 14 respectively and the remainder was given once weekly in the hope of controlling the symptoms. This patient was suffering from the paranoid form of schizophrenia. She had a pre-frontal leucotomy in June of this year and did well. She had reached the point where she not only failed to respond to electric shock treatments but was definitely worse after the last few treatments. It may seem that these numbers are unnecessarily small but we are definitely of the opinion that with few exceptions the patients who are going to respond to electric shock therapy will

TABLE II.

AVERAGE NUMBER OF SHOCKS ADMINISTERED

| | *Recovered* | *Greatly improved* | *Slightly improved* | *Unimproved* |
|---|---|---|---|---|
| Manic depressive psychosis, depressed phase .. | 8.5 | 10.5 | 10.0 | 12.0 |
| Manic depressive psychosis, excited phase .... | 8.5 | 11.0 | 15.0 | 13.0 |
| Involutional melancholia ..... | 7.0 | 7.0 | 10.0 | 9.0 |
| Psychoneuroses ..... | 8.0 | 8.5 | 7.0 | 7.2 |
| Schizophrenia ..... | 12.0 | 13.3 | 13.0 | 13.0 |
| Schizo-affective ..... | 7.6 | 11.0 | 14.3 | 15.0 |

TABLE III.

CONDITION AT JULY 1, 1947, OF 152 PATIENTS (OUT OF FIRST 210 PATIENTS) FOLLOWED FOR VARYING PERIOD—50 OVER 3 YEARS; 39 FOLLOWED 2 TO 3 YEARS; 63 FOLLOWED 1 TO 2 YEARS.

| | *Total No. of cases* | *Recovered* | *Greatly improved* | *Slightly improved* | *Unimproved* | *Dead* |
|---|---|---|---|---|---|---|
| M.D. psychosis, depressed phase | 53 | 34 (64.0%) | 10 (19.0%) | 3 (5.6%) | 3 (5.6%) | 3 (5.6%) |
| M.D. psychosis, excited phase | 19 | 7 (37.0%) | 7 (37.0%) | 0 | 5 (26.0%) | 0 |
| Involutional melancholia | 9 | 5 (46.0%) | 2 (22.0%) | 0 | 2 (22.0%) | 0 |
| Psychoneuroses | 33 | 12 (36.5%) | 13 (39.5%) | 3 (9.0%) | 4 (12.0%) | 1 (3.0%) |
| Schizophrenia | 22 | 8 (36.0%) | 1 (4.5%) | 2 (9.0%) | 11 (50.0%) | 0 |
| Schizo-affective | 16 | 3 (18.7%) | 6 (37.5%) | 4 (25.0%) | 3 (18.7%) | 0 |
| Total ..... | 152 | 69 (45.4%) | 39 (25.7%) | 12 (7.9%) | 28 (18.4%) | 4 (2.6%) |

derive the maximum of benefit from a total of ten to fifteen shocks. We are supported in this view by Gralnick[2] who said that "Courses of therapy which are extended beyond twelve to fifteen treatments, quite generally fail to produce a remission".

*Late results.* — If electro-shock treatment could be judged on the immediate results alone, it would rank as a modern miracle. However, many psychiatrists have undoubtedly made the mistake of displaying too much enthusiasm over the various forms of "shock therapy" as they have come into prominence. What we are really anxious to learn is—"What will be the long term result?" A number of follow-up reports have appeared in the literature but they are difficult to compare. However, we have the statement of Tillotson and Sulzbach[4] that not only is the recovery rate much higher with electric shock in depressive states than with conservative measures of treatment, but also that the relapse rate is lower in a shock-treated patient than in a control patient. Opposing this is the statement of Salzman[5] that relapses occur much earlier in shock-treated cases than in those treated with other measures. In his study of this aspect of the subject Salzman deals with schizophrenias and the manic depressive group.

We do not feel that we have a sufficiently large group of cases, nor have we been able to follow them over a sufficiently long period, to arrive at any conclusion on this subject but we attempted this year a follow-up study on our earlier cases. We were able to get information on 152 patients out of the first 210 treated in this series and their condition as of July 1, 1947, will be found in Table III. These figures are not particularly informative but would suggest that some of those originally classified as "greatly improved" had gone on to full recovery and that many of those originally classified as "slightly improved" had retrogressed in the interval between the time that the treatment was given and the time of the follow-up survey. It is realized that one is more apt to receive a report on a patient whose condition is good than on one who is in poor health. Accordingly, these figures might be less favourable if they represented the full number of 210 patients.

The four deaths listed in the follow-up report are accounted for as follows; one depressed patient went home unimproved and committed suicide soon after, one depressed patient went home recovered, relapsed 18 months later and committed suicide at the onset of the second attack; the third died of natural causes while mentally well; the fourth death occurred in this hospital and will be referred to later. However, we are perhaps more concerned at present with the fate of those who were classified three

TABLE IV.

PRESENT CONDITION (JULY 1, 1947) OF THOSE PREVIOUSLY CLASSED AS RECOVERED OR GREATLY IMPROVED.

| | *No. of cases following* | *Remaining well* | *Relapsed under 1 year* | *Relapsed after 1 year* | *Relapsed more than once* |
|---|---|---|---|---|---|
| Manic depressive psychosis, depressed phase | 44 | 33 (75.0%) | 5 (11.5%) | 6 (13.5%) | 1 |
| Manic depressive psychosis, excited phase | 18 | 10 (55.5%) | 5 (28.0%) | 3 (16.5%) | 2 |
| Involutional melancholia | 5 | 5 (100.0%) | | | |
| Schizophrenia | 13 | 10 (77.0%) | 1 (7.65%) | 2 (15.35%) | |
| Schizo-affective | 6 | 2 (33.3%) | | 4 (66.7%) | |
| Reactive depression | 13 | 10 (77.0%) | 2 (15.5%) | 1 (7.5%) | |
| Other Psychoneurotics | 10 | 9 (90.0%) | 1 (10.0%) | | |
| Total | 109 | 79 (72.3%) | 14 (13.0%) | 16 (14.7%) | 3 |

TABLE V.

RESULTS OF ELECTRO SHOCK TREATMENT IN RECURRENCES

| | *Second course of treatment* | | *Third course of treatment* | |
|---|---|---|---|---|
| | *Successful* | *Failure* | *Successful* | *Failure* |
| Affective disorders | 10 | 4 | 4 | 0 |
| Schizophrenia | 4 | 2 | 1 | 0 |
| Psychoneuroses | 3 | 1 | 0 | 1 |

weeks after the close of treatment as "recovered" or "greatly improved". Table IV shows that of 109 patients of these two categories whom we were able to follow, 79 or slightly over 70% remained well, 14 relapsed within a year after treatment and 16 more have already relapsed after remaining well for one year after treatment. Four patients had relapsed more than once. Of the patients of all categories who relapsed, 24 were given a second course of electro-shock (in treatment of the recurrence) and six patients received a third course. Table V shows that the results of these repeated courses of treatment are comparable to those obtained in the first instance.

*Undesirable side effects.*—While we had no deaths resulting directly from shock treatment, one death should be attributed to its indirect effects. This was in a woman 47 years of age, suffering from an anxiety state. She was in good physical health at the time of admission except for a chronic cough. Her temperature was normal and x-ray of the lungs did not reveal any abnormality. However, after four shock treatments she developed pleurisy and broncho-pneumonia and three weeks later, while convalescing from this condition, she died suddenly. There was no autopsy but the circumstances indicated death due to embolism. In the first year or so after instituting electric shock treatment, we routinely x-rayed the spine before and after treatment. A careful study of the post-shock x-rays showed what is sometimes called a first degree compression fracture of a vertebral body in 15 to 20% of the cases. However, the symptoms, when there were any associated with these findings, were of minor degree and cleared up promptly without bed rest.

In so far as fractures of this extent are concerned, we agree with Lowinger and Huddleson[6] who state that "compressive spinal fractures are inconsequential". However, we did have two compression fractures of more serious degree, one occurring with the third treatment and one with the first treatment. The latter patient is not included in this series of 300 as we wished to deal only with those who were given what we considered a full course of treatment. Both of these severe fractures occurred in men and it seems significant that we have had no serious fractures in women, though our series includes approximately three times as many females as males. Both of these patients made an uneventful recovery from the injury, but the one who had had only one shock was very slow to resume an active life due to his personality make-up. There was a dislocated shoulder in one instance, which was probably due to a faulty method of holding but I cannot recall any other complication of a mechanical nature which is worth mentioning. There is invariably, of course, a certain amount of loss of memory. This is more marked in middle-aged and elderly people than in the younger ones but all complain of it to some degree. We are now using the Liberson type of brief stimulus therapy machine and hope that the complaints of amnesia and confusion will be fewer than in the past.

In the treatment of the first 25 cases, we did not use curare at all but then began to use it in those cases where we felt the risk was increased. We continued to use it more and more extensively until it became a routine procedure, but like many others we discontinued its use something over a year ago and cannot say that we have noticed any change in the incidence of complications.

*Length of illness before shock treatment.*—There is one aspect of our results on which we probably should not offer an opinion as we have not studied it statistically, and that is the relation of the results of shock therapy to the duration of the illness prior to the institution of treatment. The idea seems to be prevalent that the best results are obtained when treatments are given early in the illness. In the affective disorders where shock is of most benefit, I think this is not true. The most startling results we have obtained were in those cases of affective disorder which had gone on for several months. It is quite possible that many of them were about due to recover spontaneously and electric shock provided the necessary stimulus to complete the job. However, one patient 60 years of age, who had been acutely excited for seven and a half years, recovered after three shocks and has now remained well for a period of eight months. This woman had shown no signs of spontaneous recovery, in fact the treatment in her case was given with little expectation of lasting results but in the hope that a very serious nursing problem might be somewhat relieved.

## Conclusions

It was intimated earlier in this paper that, in our opinion, many psychiatrists had displayed undue enthusiasm over the merits of this form of treatment which, we must admit, is not founded on scientific principles. When we instituted electro-shock therapy in this hospital we were convinced of its usefulness but were not prepared to make the claims for it which were made by some of its proponents. Occasionally one has found in the literature reports of a more conservative nature. In 1945 Alexander[1] made the following statement; "These observations lend support to the belief that it is only in those cases of mental illness wherein recovery with the aid of other forms of therapy is possible, that electro-convulsive therapy acts to hasten the process." This may seem an ultra-conservative view but at the time that we began using this form of treatment (February, 1943) we felt that proof had not been offered for any more extravagant claims. As we proceeded, it was always in the hope that we would find evidence that this treatment was more effective than the above quotation would indicate. We have looked for signs to indicate that shock had saved some patients from a life of chronic mental illness and believe that we have found some but such a proposition is difficult to prove. For the present we are content to say that electro-convulsive therapy (1) offers a good prospect of greatly shortening the duration of a recoverable illness; (2) alleviates the symptoms in many cases in which it does not shorten the illness, thus making the patient more comfortable and materially relieving the nursing burden; and (3) lessens the danger of death from exhaustion and from suicide. Our conclusions on the value of electro-shock in general are comparable to those of Geoghegan[7] whose excellent paper was read at a meeting of this society a year ago.

It is our opinion, from experience in treating mental illness both with and without the use of convulsive shock therapy, that this form of treatment is in a class by itself in regard to its effectiveness in shortening the duration of some psychoses. However, we do not consider that shock therapy alone constitutes a complete form of treatment for any patient. It is merely an adjuvant to be used judiciously along with psycho-therapy, occupational therapy and any other measures which our professional skill and our common sense would suggest as being suited to the needs of the individual patient. Secondly, while we agree with the general view that depressions as a class give a better response to electro-shock than do other forms of mental illness, we have found that some depressed patients who did not respond to shock, have recovered spontaneously at a latter date. Thirdly, our experience has led us to the belief that results with electro-shock bear a definite relation to results obtained with other forms of treatment and that they depend, not so much on the diagnosis, as on the depth of the personality change. We have felt in some cases the patient's attitude to the treatment will affect the result. Thus, patients who become progressively more frightened of the shocks, derive less and less benefit from them.

There are still many questions in our minds regarding electro-shock: "Is it here to stay or merely a fad of the moment?" "Will we find in years to come that we have been doing more harm than good?" Only time can answer these and many other questions. In our opinion it represents the greatest single contribution to psychiatric progress in a generation. However, it is purely empirical and we hope that science will bring forth something better to take its place. Until that something better comes along we will continue to use electro-shock treatment wherever it offers hope of helping sick people back to health.

I should like to thank Dr. Baugh, the Medical Superintendent of Homewood, also Drs. Bunt and Burton of our staff who have given valuable assistance in the preparation of this paper. I am especially indebted to Dr. Bunt as he has been closely associated with me in the use of this form of treatment and has administered most of the shocks.

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## Résumé

Les électro-chocs permettent d'écourter la durée de psychopathies curables, atténuent la sévérité des symptômes dans certaines maladies dont la durée n'est, par ailleurs, pas modifiée, et diminuent le danger de mort par épuisement ou par suicide. Les E.C. ne constituent pas une thérapeutique en soi. Ils sont un corollaire de la psychothérapie, de la thérapie d'occupation et de toutes autres mesures utiles. Les mélancoliques sont les malades qui répondent le mieux aux E.C. Les malades qui craignent les E.C. semblent en tirer moins de profit que ceux qui s'y soumettent volontiers. Il semble s'agir d'une thérapeutique d'attente, et bien qu'elle soit empirique, elle rend de grands services.

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