Discussion.

Dr. P. K. McCowan: I have not much that I wish to contribute on the subject, but I may say that I agree with most of what has been put before you by the opening speakers.

Rather than criticize what they have said, I will make a few brief remarks about what we have gathered from our experience in Cardiff. We have carried out over 300 treatments in prolonged narcosis there, and I draw your attention to the fact that in over 200 of these we have used glucose and insulin with a mortality of *nil*. We should, indeed, be very surprised nowadays if we even saw severe toxic symptoms. The remarks I shall make may indicate why we get the results we do.

As to the management of the case, I emphasize the importance of carrying out the treatment in a single, darkened room. This means that one can produce the results required with a very much smaller dose of narcotic than otherwise. I also wish to stress the importance of a daily testing of the patient's urine, especially for the presence of acetone. We, at Cardiff, think that many of the toxic symptoms are due to a disturbed metabolism, and we regard ketosis as an indication of the existence of a toxic condition. If acetone is present in the morning the dose is decreased, and if the acetone shows an increase we stop the narcotic drug. We do not mind a temporary interruption of the treatment. Even though you carry this treatment through successfully you are not certain to cure, and therefore you are not justified in subjecting the patient to risk of a serious nature; you do not expect these patient to die of their mental condition, and therefore you are not justified in carrying out a treatment on them which may kill them. So at the first sign of toxicity the treatment is stopped. Ketosis occurred in about 70% of our cases, and in these we increased the dose of insulin from 10 to 15 units, and if that did not clear it up we ceased the treatment.

As regards dosage, the tendency at Cardiff has been to give smaller and smaller doses. Nowadays we rarely give more than two doses of 2 c.c. each, which is sufficient in a darkened room at night; and instead of repeating it, we prefer to give paraldehyde, and we find that 4 c.c. gives sufficient sleep. This cannot be done by rule of thumb, but in the vast majority of the cases the injection is given at the same time each day. The patient is either awake or so little drowsy at breakfast time that feeding is possible, and the urination and defæcation can be attended to. If the urine is free from acetone, the first injection can then be given. After being assured as to the condition of the urine, the injection can be given by a nurse. She gives the first injection in the morning, followed by insulin and glucose, and the patient will then sleep. He is awakened for ten minutes for the mid-day liquid meal, and he will be well asleep again in ten minutes. At the next interval, if the urine is still clear, he gets his second dose. When a nurse has got into the routine it is simple enough. The point I would make is to stress the danger of the man who has treated twelve cases or so having a false sense of security and going ahead without precautions. There must be personal vigilance, and those who carry out this treatment should read the literature and try to appreciate what the danger-signs are.

I should like to make one remark about the choice of case for this treatment. The man who is about to commence this treatment should start with schizophrenics; there are plenty of those in a mental hospital who have a bad phase, which can be improved; you are dealing with a grave condition; and if you are unfortunate it is not so disastrous as it would be with a mild or recoverable case. There is nothing specific about the treatment, and it is for the doctor to choose his cases. I would, however, utter a strong warning against giving this treatment to toxic, exhausted cases; I include in this cases of exhaustion from mania and melancholia, because in them there is a definite mortality without treatment, and I do not think that type is suitable for this treatment.

https://doi.org/10.1192/bjp.82.339.437 Published online by Cambridge University Press

As to our results, we have treated 100 cases of dementia præcox, and they were mixed recent cases and chronics; 10% of them recovered, 40% were improved, 50% were no better. Of 150 manic-depressive cases one-third recovered, one-third were improved, one-third showed no change after the treatment. Of 50 cases of neurosis 40% recovered, 20% were improved, and 48% showed no change.

Prof. CARL H. BROWNING (Glasgow University) said that he had been asked to speak, so that someone who was much interested in medical science but was not over-burdened with technical knowledge of insanity should say how the presentation of such a subject struck him.

First there was the important fact—it had clearly been established as a fact—that a hitherto little-practised method of treatment was able to confer a very definite benefit in certain cases of certain types of insanity, in the direction of at least amelioration, if not cure. When stated in relation to the human animal these statements were always, at first, accepted with hesitation. One man's experience might be limited; but he took it, from the feeling of the meeting, as well as from the balanced statement of Dr. MacNiven and that of Dr. McCowan, that one was in the presence of the fact that the narcotic form of treatment was beneficial on certain occasions. Man was always seeking an explanation of what was presented to him, and from Dr. MacDonald an explanation had come which amazed the speaker. He had tried to keep clear of the pools of psychology, and he was able to follow Dr. MacDonald's reasoning, which was adapted to anyone with some knowledge of biological processes. Dr. Ford Robertson's paper had also given much food for speculation. It did not much matter whether a theory was right or wrong; so long as it stimulated people to find out something fresh it had served its purpose. A student showed him a text-book of physical chemistry, and he said to him, " Yes, that represents the truth as it is known up to 1934, but do not conclude that the truth in 1936 will be the same ". He was sure Dr. Ford Robertson brought forward his facts in the same spirit. He aimed at being provocative, but he provoked one to have some basis for going further.

And he might be allowed to say how Dr. Quastel's work had struck him. He was interested himself in a different form of therapy with drugs, and one was always confronted with the same problem. Here was a scientific substance which could confer a great benefit, but various actions diminished or neutralized its use; it was interesting to follow the means by which Dr. Quastel was led to neutralize harmful effects by insulin and glucose, so as to secure the maximum effect from this line of treatment. It was a fine example of the practical benefit which could accrue from the work of the laboratories.

Dr. PICKWORTH drew attention to the way in which these very definite dramatic restorations of sanity, including those of a temporary nature, assisted our study of the ætiology of mental disorder.

Prolonged narcosis had undoubtedly its chief action upon that part of the brain which from clinical and pathological experience constituted a sleep centre. Similar dramatic restoration of sanity has been found after treatment with the repeated rigors of malaria and other hyperpyrexial agents, which profoundly disturb the thermo-regulatory centre. Other dramatic cures had followed experimental massive asphyxiation with CO_2 and with intensive shock reactions, such as massive injection of typhoid vaccines; removal of the colon and other surgical operations; and with treatment by insulin shock.

All these actions took place near two small areas adjacent to the third ventricle constituting respectively the parasympathetic and sympathetic centres. Mental disorder was essentially not a simple infection or metabolic or endocrine disorder, but a *clinical condition* due to disturbed function of the nervous mechanisms which link body metabolism with the processes of the mind; and the dramatic undoubted improvement which followed prolonged narcosis in some cases assisted in localising

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the anatomic situation of disturbed function near to the sympathetic centre about the third ventricle.

Dr. T. C. GRAVES communicated his experience and opinion on the general treatment of mental cases with hypnotic drugs (read by Dr. Pickworth).

Firstly, for the sake of observation and diagnosis, one must be very cautious not to mask the symptoms of cases during the period when they are most directly under observation. Such masking of the symptoms, like the giving of opium in an early abdominal case, had often been the cause of later difficulties.

Secondly, many mental patients did not react to hypnotic drugs in the manner that one wished, there being a stupefying toxic action with absence of any refreshing sleep. Some cases were rendered even more excitable and exhausted by their use.

Most important of all is the benefit which one obtained in excited cases by attention to any source of chronic infection of the system. Removal of an offending tooth or the washing out of a sinus had done more, in his opinion, to lessen the need for hypnotic drugs than any routine continuance of the use of the drug itself. He had observed many cases which had been for long periods in other hospitals and then in the Birmingham hospitals under general treatment with hypnotic drugs without benefit, which cleared up by attention to such septic foci.

Dr. C. C. EASTERBROOK said the earliest case of treatment by prolonged narcosis which he could remember reading about was a case so treated by Dr. Macleod, at Shanghai, that gentleman having written a paper under the title "Bromide Sleep in Acute Mania", nearly forty years ago. The first case of the kind which Dr. Macleod had was in 1897, that of a neurasthenic lady who was a morphine addict for nine years, and who was accidentally given 2½ oz. of bromide in 2½ days. She slept for several days, and when she awoke and got better physically she was found to have been permanently cured of her morphine habit and of her neurasthenic symptoms. Dr. Macleod's only fatality was in the person of a doctor who had an artificial denture and who died from septic pneumonia. While in Shanghai Dr. Macleod was consulted about a patient in Japan who had become acutely maniacal. The only way of treating such a case there was by putting him into gaol. It occurred to Dr. Macleod that to save him from this fate to narcotize him and bring him to Shanghai by steamer was the only thing to do; that was done, and by the time he arrived he had been cured of his acute mania. Afterwards the doctor made that the basis of his treatment for similar cases. He gave 120 gr. of sodium bromide, repeated every two hours. If by the following morning the patient was not properly asleep, the dose was repeated. Usually the first two or three doses produced the desired effect, and the sleep lasted anything from five to nine days. It took two or three weeks to recover properly, but he got recovery in all his cases of drug addiction, without the unpleasantness to the patient of deprivation.

He asked whether the effect of using bromide had been tried at Cardiff, and if so, what the result was, whether there was any danger, and whether the effect was similar to that following somnifaine. Dr. Macleod's patients were nourished by milk, of which they had three pints a day, half a pint at a time, given in spoonfuls.

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