that direct spread from bed-pans was the cause of the epidemic, as pathogenic organisms were not recovered from any in use.

Summary

An outbreak of haemolytic streptococcal infection among puerperal women is described. All the 7 cases were infected with the same type of streptococcus. It is suggested that the infection was spread, directly or indirectly, from a lavatory seat in the receiving ward.

NARCO-ANALYSIS WITH NITROUS OXIDE

BY

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Since anaesthetics were first used in surgery it has been common knowledge that during the periods of induction and recovery the tongue of the patient tends to be loosened and expressions are uttered which would ordinarily be repressed. This observation merely bears witness to the truth of the saying, *In vino veritas*. During recent years psychiatrists have made use of this phase of lowered self-criticism and self-control for various purposes. The anaesthetic agents that have been chiefly employed in psychiatry have been the barbiturate group of basal narcotics.

Narco-analysis in the Twilight State

I first became interested in the possible utilization of the twilight state produced by these agents, in suitable dosage, by the accidental observation at Guy's Hospital that it was exceptionally easy to convey suggestion to patients who were recovering from avertin anaesthesia. The matter was there subsequently pursued with greater precision by Campbell (1938), who recorded a series of experiments using intravenous evipan (soluble hexobarbitone) and summarized the literature then available. Horsley (1936, 1943) has carried on a far wider range of investigations. He has coined the convenient term "narco-analysis" and has been chiefly responsible for the present widespread use of the method.

As with all new techniques, some exaggerated claims have been made for its usefulness. However, it appears to have a definite role in the treatment of certain psychiatric disorders, and has been employed at the Cassel Hospital since 1937.

The effect of the intravenous injection of a soluble barbiturate seems to be to produce a state of temporarily reduced self-criticism in which suggestions are more readily accepted and in which painful or repressed ideas come more readily to consciousness. This effect is closely comparable to that which may be produced by light hypnosis, but it is achieved without the two main disadvantages of hypnosis—namely, a semi-magical atmosphere and the risk of the development of an excessive, often sexually coloured, dependence upon the hypnotist.

In the treatment of neurosis the method is useful in two types of problem: first, in conversion hysteria, particularly in hysterical fugues, for the rapid removal of symptoms or recovery of memory by suggestion and persuasion under narcosis; secondly, in anxiety neuroses and other disorders in which fairly deep psychological analysis is required, for the rapid access, by free association under narcosis, to repressed ideas and complexes which may lie at the root of the condition. In both types of disorder the use of the drug may produce dramatic results ranging from the vivid emotional recollection of some recent terrifying incident to the recapture of some long-forgotten childhood fantasy.

The method is essentially and principally a time-saving one. It is doubtful whether, in the neuroses at least, results are obtained which could not ultimately have been gained without its use. However, in psychiatry particularly, any method of investigation or treatment which saves the time of physician or patient is of the utmost practical value.

The disadvantages of narco-analysis by means of barbiturates are twofold. There is first the objection, which has recently been brought more clearly to the attention of the medical profession, that the intravenous injection of barbiturate drugs, particularly when it may have to be repeated many times, is not without hazards. This links up with the second objection

—namely, that the method is not as time-saving as one would like. In order to carry it out with adequate safeguards for the patient an assistant is necessary; the patient must be prepared as if for a short general anaesthetic, and resuscitation materials must be at hand. This preparation must be repeated for each injection, although in some cases the progress made at a single session may be very limited.

The Nitrous Oxide Method

During the past 12 months a way has been found of overcoming these objections by the substitution of inhaled nitrous oxide for intravenous barbiturates as the anaesthetic agent. Experiments with nitrous oxide were begun because many patients and normal individuals spoke of the remarkable feeling of release, of freedom, and of power which they experienced under gas. Such feelings generally point to just that reduction of the normal critical faculties which it is the aim of narco-analysis to achieve.

It was found that a slow induction of analgesia, using a mixture of gas and air, gave the best results, and for this purpose the Minnitt obstetrical gas-air-algesia apparatus proved ideal. This has a number of advantages over the ordinary gas-anaesthesia apparatus. First, the flow of gas is regulated by the patient's breathing, so that there is no waste. Secondly, the patient himself controls his intake of gas and can stop at any moment; fear is thus almost entirely eliminated. Lastly, the apparatus is simple and requires almost no manipulation by the psychiatrist.

The proportion of gas to air delivered by the machine in normal usage is about 45%. This is enough for many patients, but can be increased if necessary by closing one or two of the air-inlet holes with the fingers. With this method it is not advantageous to render the patient unconscious, as it wastes time to do so and is apt to diminish the co-operation of the patient. The best technique appears to be to allow the patient to breathe the mixture until restless movements and some change in the rhythm of respiration herald the approach of loss of consciousness. At this point the patient's own grip on the mask and on the air-hole at the back of it relaxes (as indeed with this apparatus it is intended that it shall do), and the inhalation of gas ceases. The subsequent twilight state, which lasts for a minute or two and which is very easily prolonged by suggestion, is utilized for narco-analysis. About 20 breaths of the mixture usually suffice, and the experiment can be repeated as soon as the effect has worn off.

In practice the method and its intentions are explained to the patient and the use of the apparatus is demonstrated to him. He is shown how the whole process is under his own control, and this at once allays apprehension. He is invited to have a "trial run" without any attempt at psychotherapeutic intervention. After this he is ready to begin.

At first, during the whole of the induction period, gentle suggestions are given that he is becoming relaxed, that painful ideas will come more readily to his mind, and that his thoughts are flowing easily and without restraint. Directly he drops the mask he is urged to express whatever comes into his mind. In the case of a hysterical fugue he is told that he will relive the forgotten incidents, just as would be done under hypnosis or narco-analysis with a barbiturate.

In our experience abreaction and the recall of repressed memories are as vivid and as readily obtained as with any other method, and the time and preparation saved are of course very great. The method has been employed with a considerable number of patients during the past year, of which the two following are representative examples.

Illustrative Cases

Case 1.—A male aged 19; admitted July, 1943. Reason for referral: loss of memory; periodic fugue states in which he wandered away from home after an emotional crisis, usually in relation to some delinquent behaviour. A normal child until the age of 5, when he had rheumatic chorea and his parents were told that he must not be crossed in anything. Subsequently avoided responsibility and punishment because of his "delicacy." First wandered away from school at 14 in a fugue following some minor difficulties there. Had subsequent fugues after failing an examination and after being found out in a series of lies. Three months before admission, after a row with his grandfather, who took a stern and realistic view

of his behaviour, he fell downstairs and was picked up with complete amnesia for the whole of his past life. Concussion was at first diagnosed, but the picture was soon seen to be essentially a hysterical one, and he was admitted to hospital after attempts at recovery of memory by persuasion had failed. Administration of nitrous oxide, using the technique described, produced a dramatic return of memory for the events preceding the fall and for the main events of his past life. Subsequent administration enabled him to recall and relive his activities during previous fugue states, which he claimed had never been recollected. Psychotherapy was then continued along orthodox lines.

Such dramatic recollections and abreactions are very pleasing at first sight, but they do not constitute the principal justification for the use of this method. An experienced and sympathetic psychiatrist can usually resolve a hysterical amnesia of this type by almost any method provided that he has won the confidence of the patient. Nitrous oxide merely provides a simple, quick, and efficient method which may be preferred on this account. Its usefulness is, however, most apparent in cases requiring difficult psychological analysis, where the time factor is even more important and where a rapid resolution of repressed conflicts is very desirable.

The second case belongs to this type. This patient presented a typical severe anxiety neurosis.

Case 2.—Mrs. A., aged 32; admitted May, 1943. Reason for referral: feelings of exhaustion and weakness; loss of weight; worry over bowels and food. The symptoms had been present to some extent for about 10 years. The immediate reason for their onset seemed simple and straightforward. She was the child of a financially poor family, and after winning a series of scholarships had had a brilliant undergraduate career at a provincial university and had come with a research scholarship to Oxford. There she found herself, both socially and intellectually, in much deeper waters, and since she had always been used to unquestioned leadership at school and at her own university she reacted with anxiety symptoms. She subsequently married a professor in her own field of work and had three children in very rapid succession. She found difficulty in living up to her husband's family, and the stresses to which she was subjected increased the anxiety symptoms so that a typical vicious circle of anxiety was created. Such a problem is often fairly readily resolved by superficial analysis combined with explanation, persuasion, and re-education. In this case, however, a deeper and much more complex set of factors were speedily uncovered. Behind the difficulties in her married life there lay a pathological emotional relationship with her father, the solution of which was essential to her recovery. Analysis was at first slow and difficult, but the repeated use of nitrous oxide inhalations produced a rapid flow of forgotten associations of a highly painful sexual character. The patient herself repeatedly asked for the apparatus during the process of free association, and learned how to use it without assistance or advice during difficult periods in the treatment. In this fashion a course of analytical psychotherapy which in the ordinary way would certainly have lasted a year was successfully concluded in six months, and the patient was then able to return home.

Comment

It seems certain, from our experience, that other methods of narco-analysis could not have achieved similar results without a far greater expenditure of time for therapist and patient. Repeated sessions under narcosis were necessary, and would have been necessary whatever narcotic was employed. One can resolve a hysterical amnesia or obtain an abreaction to a particular traumatic event in one session, but one cannot unravel the trend of events, often spread over a number of years, which go to the evolution of a problem of this type. In such a case the availability of narcosis "on tap" in the consulting-room, ready to be used at any moment in the course of analysis, is a very great advantage. Patients themselves express a strong preference for the nitrous oxide technique, and, where both have been used in a single case, access to hidden mental conflicts is fully as effective with gas as it is with a barbiturate.

Summary

The value and limitations of the method of narco-analysis in psychotherapy are briefly discussed. The intravenous injection of a barbiturate has been the method generally employed. Nitrous oxide inhalation is claimed to be fully as effective for this purpose; it is quicker, simpler, and safer, and can be used in the consulting-room at any time during the course of psychiatric treatment.

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Medical Memoranda

Large Goitre in a Child of 10

The following case history, with a photograph of the patient, may be considered worth publishing.

A girl aged 10, of miserably poor parents from Abu Tig, in Upper Egypt, came to this hospital in November, 1943. She had a history of a gradual enlargement of the neck, and general ill-health, of four years' duration. There was no complaint of dyspnoea or dysphagia.

On examination the child was seen to be wizened, anaemic, and poorly developed. Though alleged to be 10 years old she weighed only 43 lb., the average weight of a child of 6. There was a large, somewhat nodular, fairly firm bilobed mass, obviously a goitre, extending from mandible to manubrium and well beyond the sides of the neck (see photograph). The tumour was freely movable on manipulation and deglutition, and there was no stridor. A number of enlarged subcutaneous veins were observed moving in different directions over the tumour. The circumference of the neck and tumour varied from 18 to 20 inches. The child was found to be suffering from ankylostomiasis, as is usual with some 90% of Egyptian "fellahin." Her haemoglobin was only 60%, and so the ankylostomiasis and anaemia were treated before operation. She also had some dermatitis over the tumour and chest, which can be noted in the photograph; this responded quickly to simple ointments. There were no signs of thyrotoxicosis.

Operation.—As there were no facilities for intratracheal anaesthesia the patient was given 2 drachms of paraldehyde per rectum one hour and 1/200 gr. of atropine half an hour before operation. Only a very small amount of open ether was necessary after this premedication, and there was no anxiety over the airway throughout the operation. The usual "collar" incision was employed, and all but a small portion of the thyroid mass was excised. There was no difficulty apart from the number and size of the vessels, and haemorrhage was minimal. A small drain was inserted through a stab wound below the incision, being removed after 48 hours. Convalescence was rapid and uneventful, and the father insisted on removing the child some three weeks after the operation, before any great improvement in the general condition could be expected.

Examination of the Tumour.—The growth was in two parts, corresponding to the right and left lobes of the thyroid gland and parts of the isthmus. In appearance it was similar to normal thyroid tissue, but with numerous cysts, varying in size and filled with dark viscid fluid. The right-hand portion measured 6 by 2½ by 2½ in., and the left portion 5 by 2½ by 2½ in. The microscopical report stated, "The appearances are those of a papillary adenoma of the thyroid gland."

My reasons for reporting this case are the large size of the goitre, the comparative brevity of the history, and the youth of the patient. I am indebted to the pathologist and the photographer for their help.

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Varicella and Herpes Zoster: An Experiment

Observations, both clinical and experimental, have repeatedly been made which suggest the existence of a close relationship between the aetiological agents of varicella and herpes zoster. In view of this the following experiment was carried out to find whether convalescent herpes zoster serum would be effective in preventing varicella in varicella contacts. The scale of the experiment was small, but the findings are perhaps suggestive enough to justify publication.

Blood was taken from two herpes zoster patients during the second week after appearance of the eruption. After clotting, the serum was put up in ampoules and stored at a temperature of 4° C. till an opportunity arose for its use (about two months).

On May 31, 1942, varicella developed in a child of 6 years in one of the children's wards in this hospital. Of the other 19 children in the ward, 6 had a previous history of varicella. Of the 13 who had not previously had varicella, 7 were given an