

but profit from the experiences of psychiatrists who have used a great variety of means to produce convulsions, including hypoglycaemia; they have the opportunity to observe the premonitory movements and the whole sequel of signs in artificial epilepsy at their ease.

The following observations are of interest in respect of the theories of ether convulsions. Atropine is regularly given in psychiatric cases to combat vomiting after convulsant drugs; only single twitchings, but never a full seizure, can be evoked by external—"neurogenic"—stimulation if the amount of the drug or of the electric current administered is below the convulsant threshold. The difference between the psychiatric patient in good physical health and a patient with high temperature on the operation table is obvious, but does not seem so great that a combined effort should not yield instructive results.—I am, etc.,

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Spinal Anaesthesia

SIR.—Having used percaine on a series of cases running into several thousands, I beg to plead for a flexibility of technique which should be associated with anaesthesia no less than with surgery: no single method is ideal for every case.

I have found the Etherington-Wilson technique to be the most accurate and rapid method for obtaining a high block, failure to achieve which is invariably due to neglect of details or faulty technique; but as this method is reasonably simple I cannot regard failure from that cause as being a contraindication. There is also one advantage which has not been stressed: there is no need to test for anaesthesia providing paraesthesias, notably "pins and needles" in the feet, are present.

The use of N_2O and O_2 in a closed circuit assists in controlling respiration and in the avoidance of vomiting, which is either anoxic or reflex; the lightness of the anaesthesia required permits the employment of adequate oxygen and precludes the necessity for recourse to an agent of 100% potency such as cyclopropane, which, being both scarce and costly, should be kept for use by itself. Pentothal, owing to its depressant effect on respiration, should not be used save in the small amount sometimes desirable before spinal puncture in an apprehensive patient. In spite of the aspersions cast on it, a wheal at the site of the puncture will be found to decrease discomfort to a marked degree. I can thoroughly endorse all observations concerning the value of phedracin (Ciba 2020), which is best used intravenously.

For low blocks the same precision is not obtainable by means of the Etherington-Wilson technique as by the Howard Jones method with the hypobaric solution, or the various methods which employ the hyperbaric ("heavy") solution. Where the latter is seen to its greatest advantage is in the anaesthesia of the "saddle area" obtained by the "Sitting Bull" technique (Maxson) with 1 c.cm. of the "heavy" percaine, representing one of the least traumatic anaesthetic procedures possible. However, for surgeons who prefer to do anal operations on patients in the prone position an equally satisfactory result is obtainable with the "light" solution, which can be injected when the patient is in position, no further movement of the patient or even of the towels being necessary. It can thus be seen that both solutions have their own particular advantages; but both are highly susceptible to alkali contamination, the result of which is more readily visible in the case of the heavy solution, precipitation being immediate and obvious.

To reserve spinal anaesthesia for the robust seems as ill judged as to inflict it on the moribund, there being a great number of intermediate cases in which only the most pusillanimous would deny their patient the advantages of a spinal anaesthetic owing to an element of risk. It is our function to assess which are legitimate risks and which are not, and it will be found that the mortality bears an inverse ratio to the experience of the anaesthetist.

There are two main contraindications to spinal anaesthesia. These are cardiovascular degeneration, and general decrepitude from any cause; but before deciding against spinal anaesthesia the increased facility, which means speed in operating in a quiet abdomen, and the remote mortality associated with the volatile anaesthetic agents should be considered; a death after a general anaesthetic is as suggestive of an error in judgment

as is a death on the table under a spinal anaesthetic. Finally, I would plead for an eclectic attitude in technique and for the retention of both "light" and "heavy" percaine in the anaesthetist's armamentarium.—I am, etc.,

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Heavy Percaine in Spinal Anaesthesia

SIR.—I should like to say how much I have appreciated Dr. Mushin's recent article. His views are practically identical with those I have formed on a series of 150 cases. Hypobaric techniques have been predominantly popular wherever I have worked, but realizing the greater comfort to the patient and the greater ease of administration of hyperbaric percaine I have used it now for the past eighteen months.

Many anaesthetists omit to turn the patient into the prone position when using "light" percaine because they realize it is uncomfortable for the patient, especially those who are in pain from perforated gastric ulcer or who have such conditions as colostomy or marked abdominal distension. It is also a cumbersome procedure. As laid down by Howard Jones, however, it must be done to ensure adequate sensory loss in upper abdominal operations, though it may be disregarded in operations below the umbilicus. It is, however, in just those painful upper abdominal operations that it is so necessary. In order to avoid this, I have on occasion seen the patient tilted in extreme head-down tilt with nurses and orderlies hanging on to the patient's shoulders. Or else they may be subjected to a similar extreme tilt in the reverse Trendelenburg, again with willing hands holding the patient from slipping on to the floor. Again, I have seen the bridge of the table raised in the small of the back, which certainly increases the discomfort of the patient. Again, patients much prefer to have their heads slightly raised on a pillow during an operation performed under a spinal anaesthetic, especially when they remain conscious. Light percaine technique is safer when the head is kept low, whereas in heavy percaine anaesthesia the head is slightly raised. Finally, except for a slight tilt of from 5° to 10° there is absolutely no shifting of the patient under heavy percaine once the lumbar puncture has been performed. There is also less chance of the needle becoming dislodged when using a small quantity of fluid, as in heavy percaine technique, than there is when introducing five or six times as much fluid as in light percaine block, with less possibility of deposition of percaine outside the theca leading to partial failure. In other words, heavy percaine is less cumbersome to use and more comfortable to the patient, the second quality being more important than the first. It was particularly interesting to compare Dr. Mushin's article with that read at the Royal Society of Medicine by Dr. Frankis Evans last year. The former gives us the maximum doses to be used, the latter the minimum.

With regard to premedication, I agree most emphatically in condemning heavy respiratory depressants before a spinal anaesthetic. My choice lies between omnopon and scopolamine and nembutal and morphine. For urgent operations I premedicate with omnopon gr. $1/3$ and scopolamine gr. $1/150$, and give a small dose of pentothal on the table prior to the lumbar puncture if the condition is painful, like a perforated gastric ulcer in a robust subject. For prearranged cases I give nembutal gr. 3 two and a half hours before operation, with morphine gr. $1/6$ later, depending on the action of the nembutal. Both types of case receive N_2O+O_2 when the operation takes place in the upper abdomen. CO_2 absorption, of course, should be combined to control the depth of respiration. Cases for spinal anaesthesia must be chosen carefully. The upper abdomen must not be considered as a bar to spinal. That is akin to saying, "I do not use chloroform because I am afraid of it or it is dangerous." Most gastrectomies do better under endotracheal inhalation anaesthesia, but one occasionally experiences the robust subject who simply will not relax under inhalation anaesthesia, and here it is so important to achieve relaxation before the peritoneum is opened, otherwise it retracts from the wound and is again "difficult" when it comes to sewing up.

With regard to sterilizing of instruments, I have had some disappointments using distilled water, even when HCl has been added, probably because the bowls coming from ordinary