

bulk of cases in general surgery. The preliminary administration of nitrous oxide is especially to be recommended in muscular, alcoholic, nervous, or excitable patients. Atmospheric air should be rigidly excluded during the inhalation of the nitrous oxide; ether vapor should be *gradually and increasingly* admitted when the signs of nitrous oxide narcosis commence to appear, and, when much epileptiform movement occurs, a small quantity of air should be allowed. A portable apparatus, by which it is possible to administer these anesthetics in the manner advised, is manufactured. The sudden transition from the inhalation of nitrous oxide to that of strong ether vapor is not desirable. By the above method, coughing, excitement, inhibition of breathing, and struggling are prevented.

2. Vomiting during the administration of an anesthetic is usually to be prevented by rapidly and thoroughly anesthetizing the patient, the diet having been previously regulated. Deep narcosis having once been established, reflex acts should be carefully watched for. Among these, deglutition is often an important indicator of incipient coughing or vomiting, and if it occurred the administration should be pushed. The chances of vomiting after the administration can be lessened by the above means; in addition to this, the swallowing of mucus or blood should be prevented by keeping the patient's head upon its side. The patient should be moved as little as possible after the operation. Experiments with cocaine (in aqueous solution administered before the operation) have been made, but it is difficult to say whether it had answered its purpose.

3. It is questionable whether any anesthetic should be giving to patients suffering from obstructive dyspnea. In a case in which a large innominate aneurism pressed upon the trachea, and which was rapidly enlarging, an operation was decided upon. Previous experiment had shown that digital pressure upon the subclavian and carotid arteries did not materially increase the dyspnea. Chloroform was cautiously given. After the ligature of the carotid the breathing became feeble, and, after the other artery had been tied, it ceased and could not be restored by artificial means. It was probable in this case that the nervous mechanism of respiration, doubtless somewhat exhausted before the operation, could not be sufficiently stimulated during anesthetic sleep by the imperfectly oxygenated blood. Artificial respiration was ineffectual, although, before the operation, the chest and abdominal movements were perfectly competent to maintain the due oxygenation of the patient's blood. Another case of a similar nature, and with an equally untoward result, had been reported to the author; and in future he would certainly refrain from administering an anesthetic to such patients.

4. The sedative effects which opium or morphine exert upon the respiratory system should certainly contra-indicate their employment in cases in which respiratory embarrassment or failure would be likely to occur. Professor Victor Horsley has advised the subcutaneous injection of morphine in cerebral surgery; and the injection of morphine with atropine before the administration of a general anesthetic, has been adopted by many surgeons upon the continent. The practice, however, was one which should be followed with the greatest caution, and in many cases altogether avoided. In illustration of this may be cited the following remarkable case, in which it seemed probable that the cessation of breathing which occurred was partly or wholly to be attributed to morphine thus administered. The patient was a young woman who presented unmistakable symptoms of a cerebral tumor in the cortex of the brain. When prepared for operation she was semi-comatose and hemiplegic; the corneal reflex was well marked; her pulse was 90, weak but regular; her respiration was feeble. A hypodermic injection of morphine was given, and the administration of the anesthetic (a mixture of four parts of chloroform to one part of alcohol) was commenced with a Junker's inhaler. Very little of the anesthetic was needed (one drachm throughout). As the operation proceeded, respiration became more and more feeble and then ceased. It was restored by artificial means, but again ceased and was again restored. One hour and a quarter after the commencement of the operation it ceased for the third time and could not be made to return. Artificial respiration was then kept up (with occasional intermissions to see whether automatic breathing would return) for *four hours*, during which time the operation was successfully completed. After four hours, automatic breathing re-commenced, but ceased not very long after (about two hours), and the patient died. The probable explanation to be given of such an occurrence is this: the respiratory nervous mechanism, already much enfeebled, and possessing like the rest of the nerve tissues but a very limited store of energy, was rendered less capable of emitting those impulses upon which depended the respiratory movements of the patient, by reasons of the sedative drug introduced into the system. There was no reason to accuse the anesthetic; for the cessation of respiration was not like that observed in chloroform poisoning, and when artificial respiration has re-established automatic breathing in the latter condition, recovery invariably ensues in the absence of complications. The manipulations to which the brain was subjected, or the loss of blood which necessarily took place, might have exerted some influence; but from the general considerations of the case, and from the knowledge of the dangerous effects which morphine may produce in conditions