needle actually reached the desired spot.

"... In the department of biochemistry... the following schedule is... in operation: 1. Blood—Present knowledge of blood preservation; trends in the operation of hospital blood banks and in the distribution of blood to hospitals; new developments in apparatus for collecting, storing, and administering blood. 2. Blood Substitutes and Blood Groups—Current views on so-called blood substitutes; use of preserved blood serum, plasma, albumin and globin; survey of blood groups and types. Laboratory demonstrations on technique of blood-typing. 3. The Rh Factor and Its Clinical Significance—Present knowledge and trends. 4. Body Water and Electrolytes—Review of salt and water metabolism. 5. Nutrition—Basic considerations in energetics and nutrition. 6. Liver Function and Liver Damage—Critique of various tests of liver function; factors which cause liver damage; renal-herpetic relationship. 7. Kidney Function—Current concepts of function and factors that lead to impairment. 8. Protein Metabolism in Disease—Disturbance in nitrogen metabolism after trauma; treatment—restoration of nitrogen balance.

"In... pharmacology six one hour periods are devoted to... actions of various drugs used in anaesthesia. Particular attention is paid to the opiates, the barbiturates, drugs used for regional anaesthesia, eurare preparations, and the analeptic drugs. . . .

"The course in physiology consists of lectures and demonstrations followed by laboratory periods in which the saline points of the lectures are studied experimentally. Six afternoons of three hours each are given over to this work. . . . The main attention is directed to three major systems most directly implicated in anaesthesia: (1) The nervous system, (2) the respiratory system, and (3) the cardiovascular system. Under the first are treated the problems of Pain, Sleep and Unconsciousness, Muscular Tone and Relaxation, and the Autonomic System. For the second are subsumed Mechanical Factors, Nervous Control, and Chemical Control. The third is divided under the headings of The Heart, and The Blood Pressure."

D. D. G.


"Death on the table is fortunately not a common accident but its rarity makes it all the more difficult to obtain any definite information concerning its causation. . . . We have therefore collected from the records of the hospital which we serve the details of all the deaths which have occurred under anaesthesia in the last 14 years. In all 77 patients died on the table in this period. In a few cases no adequate explanation of the accident could be obtained from the information available, but in most the cause of death was clear enough. . . .

"In the 10 cases of death under spinal anaesthesia the anaesthetist was in the vast majority a recently qualified house surgeon. All the patients were poor risks. The solutions were heavier than the cerebrospinal fluid and if the technique taught (viz. 3° to 5° Trendelenburg position with the head raised) was used there could be no possibility of the paralysis of the phrenic roots by the direct action of the solution. The cause of death must therefore be sought elsewhere than in respiratory paralysis, and in fact there were no records of this phenomenon. That the proximate cause of these catastrophes was heart failure seems to admit of no doubt, but as a spinal anaesthetic has no direct action on the myocardium the question arises as to
how cardiovascular failure develops. In the experimental laboratory it has hitherto proved impossible to produce heart failure under spinal anaesthesia whatever the fall in blood pressure, provided the animal is supplied with oxygen. Anoxia therefore would seem to be the undeniable predecessor of the heart failure. There were many factors tending to produce anoxia in the patients of the present series.

"The 6 deaths from ether convulsions should occasion little surprise. . . . It is significant, however, that in our own hospital no deaths have occurred since 1941, i.e., since it became generally known that an adequate dose of a barbiturate would control the convulsions.

"Chloroform deaths from primary cardiac failure are likewise becoming a thing of the past as this agent is falling into general disuse. . . . Primary cardiac failure during thyroidectomy remains depressingly common. In this series its incidence was independent of the type of anaesthetic and premedication given. . . . The cause of the collapse was presumably ventricular fibrillation, the result of undue irritability of the cardiac muscle, produced by thyroid intoxiation.

"Ten of the 77 patients in the series seemed to be almost in articulo mortis at the time at which operation was performed. There is nothing to be gained from further discussion of these cases.

"The neurosurgical unit deaths fall into two groups, those where compression of the vital centres was responsible and those where haemorrhage too severe to be controlled by ordinary methods took place. Accidents of the latter type are much less common nowadays with blood-bank facilities, but in this connection it should be noted that where extremely severe haemorrhage is anticipated fluid can be given much more quickly by a French's needle into an arm vein than through a gold cannula tied into the saphenous vein.

"The heading of shock is unsatisfactory and this group certainly includes some patients in whom the anaesthetic was at least in part responsible for the fatal issue. Some of the patients were found to be pulseless and apnoeic at the end of long abdominal operations.

"Drowning of the patient in his own secretions is a well-recognized risk of anaesthesia. It happened four times in the present series. Two patients, both suffering from intestinal obstruction, died from aspiration of vomitus. In neither instance had the stomach been drained adequately before operation nor was there a stomach tube in situ at the time of the accident. . . . There have been no accidents of this type since 1934.

"The other form of drowning during anaesthesia is a risk peculiar to major thoracic surgery in 'wet' patients. When the pleura is opened the diseased lung collapses and ejects the fluid contained in the cavities within it into the bronchi and trachea, which are at once occluded. The patient becomes progressively more cyanosed and eventually dies of asphyxia.

"In 5 cases no satisfactory explanation of the death could be elicited from the hospital records. In 2 instances the patient was found dead in bed shortly after the anaesthetic had been withdrawn. The presumptive cause of death was obstruction of the airway, and the lesson to be learned is the importance of educating nurses in the proper handling of the unconscious patient.

"The frequency of death on the table with different anaesthetics is not easy to obtain. . . . The figure for death under spinal anaesthesia, 11 in 29,500 cases, or 0.049 per cent, compares very
favorably with that for operations under general anaesthetics (0.077 per cent). This is particularly noteworthy, since spinal anaesthesia is the method of choice for emergency abdominal surgery.”

B. I. S.

GILLIES, JOHN: Analysis of Replies to a Questionary on the Use of Chloroform at the Present Time. Anaesthesia 3: 45-52 (Apr.) 1945.

“On the occasion of the Centenary of the introduction of chloroform as an anaesthetic agent, we issued a questionary on the use of chloroform. . . . Two forms of questionary were sent out, one to general practitioners in Scotland and the other to specialist anaesthetists attached to teaching hospitals in Britain, America and several European countries. The numerical response to the questionary was only fair. Of 1,920 general practitioners, 871 replied and of 366 specialists, 177 completed the form. . . . It must be said, at the outset, that one did not expect great precision in the figures. In many cases, particularly in the replies from the general practitioners, the figures were very approximate. . . .

“Of the 871 practitioners, 6 stated that they never give anaesthetics at all; 865 were in the habit of administering anaesthetics in their own obstetrical work and of those 813 used chloroform; 30 used chloroform in combination with ether or as part of a sequence with nitrous oxide and oxygen; only 5 used ether alone. . . . In the choice of anaesthetic for obstetrics, chloroform, in Scotland at any rate, appears to be overwhelmingly popular. . . . Practitioners were also asked to state their choice of anaesthetic for minor surgery. Of 825 who occasionally gave anaesthetics in this class of work, 198 used chloroform; 154, ethyl chloride; 123, nitrous oxide; and, rather surpris-ingly, local analgesia was the method of choice given in 186 replies. . . . The number of practitioners giving anaesthetics for major surgery is much smaller than in the other groups. The operations were mostly those of an emergency character. Of 452 general practitioners doing such work, 123 expressed a preference for chloroform while 195 chose ether preceded by various induction agents such as nitrous oxide, ethyl chloride and pentothal. Chloroform and ether, either as a mixture or sequence, was used by 118. In the category of ‘Others’ were included spinal analgesia—9 users, and nitrous oxide and oxygen by 3 optimists. . . . For the most part, the specialists stated specifically that chloroform was never used routinely but merely to meet special circumstances. . . . The problem of fatalities from the use of chloroform was also investigated. All practitioners and specialists were asked to give their figures in respect to this. Of the general practitioners, 752 stated they have had no deaths and 119 had 155 deaths amongst them. This is probably an understatement and it certainly does not include deaths in the immediate postoperative period. In a total of 1,084,870 administrations, the death-rate was 1:7,000 for the chloroform cases in general practice. Of 167 specialists using chloroform, 111 had no deaths and 56 had 100 between them. In a total of 276,000 administrations the ratio works out at 1:2,760. . . .

“One striking feature of the analysis is associated with the question as to whether atropine was used with the chloroform. In 234,900 administrations by general practitioners chloroform was preceded by atropine and in this series there were recorded 24 deaths during the induction period, a ratio of 1:9,788, and 44 during maintenance, a ratio of 1:5,339. The number of administrations without atropine was 578,650 in which there occurred