SOME OBSERVATIONS ON POST-ANAESTHETIC
COMPLICATIONS.*

BY

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OBSERVATIONS have been made upon 571 cases of general anaesthesia, drawn from the Hospital for Women and the Royal Infirmary, Liverpool, attention being particularly focussed on three common post-operative complications—namely, chest trouble, flatulence, and vomiting. In the series there have been four deaths—one from operative shock, one from bronchopneumonia, one from acidosis, and one, which occurred on the fifth day after a laparotomy for inoperable carcinoma, may be laid to the door of both surgeon and anaesthetist, as there were some symptoms of acid intoxication.

Among the gynaecological cases there were 221 major abdominal and 220 minor vaginal operations. Warm ether, with where necessary a small addition of chloroform, was given to the former, and open ether to the latter. The chest complications for both classes of case amounted to 22—that is, 4.5 per cent.; serious trouble, such as bronchitis and bronchopneumonia (including the death already mentioned), occurred five times—1.1 per cent.; the remainder, coughs without physical signs, soon cleared up when a mixture containing calcium chloride and liquor atropinae was given. The major operations showed a morbidity of 7.5 per cent., and the minor of 2.2 per cent. I think it will be admitted that 1.1 per cent. of serious pulmonary disease after operation is low, and it may be attributed to the use of warmed ether vapour, as prior to its introduction at the Hospital for Women lung complications were considerably more frequent. It does not, however, entirely prevent the likelihood of bronchitis if given to a patient already suffering from a "cold," and where there is any acute catarrh of the respiratory tract a general anaesthetic, except for emergencies, is contraindicated, though I would add that in such cases chloroform is justifiable.

The usually accepted causes of ether bronchitis, such as septic mouth, draughts, chills from sweating, etc., are guarded against as much as possible, and all masks, gauze, and face pads are sterilized at the Hospital for Women, so it is difficult to account for this 4.5 per cent., but in 11 out of the 22 cases the following possible factors were noted: pre-operative cough, some cyanosis during part of the operation, prolonged operation, the patient required more than the usual amount of ether, light anaesthesia, and pulling on the peritoneum.

To illustrate the possibility of prophylaxis I would mention the case of a very stout woman, aged 36, who, after an operation for removal of both appendages, had considerable bronchitis for a week; two months later it was found necessary to perform a total hysterectomy, but after three days' preoperative treatment with the mixture already mentioned she recovered from the anaesthetic with neither cough nor vomiting. A further practical point is that when morphine is used along with atropine, 1/150 grain of the latter is sufficient to prevent salivation, and does not cause the irritating dryness of the mouth so frequently complained of after 1/100 grain.

Flatulence occurred twenty-four times in the series, which gives a percentage of 5.4, but here it must be noted that an important alteration in the treatment prior to operation took place during the observations. To the first 266 cases 1 oz. of castor oil was given thirty-six hours before, an enema eight hours before, 1/4 grain morphine and 1/100 grain of atropine one hour before, and a very light liquid diet on the day preceding operation. Here the percentage of flatulence was 6. The following 175 cases were given castor oil as before, but the enema was omitted except for those requiring perineal repair, the dose of morphine was lessened to 1/6 grain, and a more generous diet allowed—ordinary food the previous day, and a breakfast of tea and toast, followed by 1 oz. of syrup of glucose one hour before operation. Under this régime flatulence occurred in 4.5 per cent. only. It should, however, be added that the ward sister, without whose most intelligent co-operation this note could not have been written, considers the improvement in this respect to have been greater than is shown by the figures, and her opinion is corroborated by a sister at the Royal Infirmary,

whose experience after a similar change in preparation is that "the patients are much less distended and uncomfortable."

Vomiting, the commonest and most distressing complication we have to deal with, was met with 91 times in 441 cases, major operations showing 27.6 per cent. and minor operations 12.7 per cent., the percentage in all cases being 20.1. These figures include all grades of vomiting, and require modification; 350 women were not sick at all, which I must confess surprised me; of the remainder, 52 (11.7 per cent.) only brought up a little mucus once or twice directly after return to the ward, 17 (3.8 per cent.) vomited several times, but were comfortable within six hours of the operation, and 32 (7.2 per cent.) continued to vomit for periods varying from ten hours to three days. Here the change in preparation caused disappointment, as the total vomiting percentage increased from 17.2 to 25.1 instead of showing the decrease which had been hoped for. There is, however, one scrap of comfort in that the increase occurred in the slight and moderate forms of sickness; the severe class showed a decrease from 6 to 3.4 per cent.

There is not time to analyse completely the 130 cases on which notes have been taken at the Royal Infirmary, but a comparison may be made, as both "open" and "close" methods of anaesthetization were in use. Where ether was given on an open mask vomiting took place in 51.2 per cent. of cases; in 5 per cent. it was of a serious nature; Ormsby's inhaler, on the other hand, only produced 32 per cent., but in 10 per cent. the sickness continued for more than six hours. This is contrary to the generally accepted belief that "open ether" causes less vomiting than "close," but it bears out the opinion of many anaesthetists that in the hands of an expert the despised bag has much to commend it.

Whether the increased percentage at the Royal Infirmary, where the figures are more than double those at the Hospital for Women (43.8 per cent. compared with 20.1 per cent.), is accounted for by the fact that at the former an enema is given and no aperient, or that the anaesthetics are largely given by the students, I am not prepared to say, but the difference is rather striking.

The morbidity rates disclosed by this series of observations are, it must be confessed, disappointing, but they are brought forward with the idea of interesting others enough to find some alteration of technique which will eliminate these three common sources of trouble and further improve what may be called the handmaiden of surgery.

May I close by expressing my thanks to Dr. Gemmell and Messrs. Bickersteth and Jeans, from whose clinics these few facts have been extracted.

THE DIAGNOSTIC VALUE OF THE PLANTAR
EXTENSOR RESPONSE.

BY

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FROM the time when this sign was first described by Babinski we have been taught and have reverently bowed the knee to its organic significance. From time to time some diffident suggestions have appeared that possibly it might be liable to variation, but I have never seen any definite statement impugning its reliability. I know the difficulty of sometimes obtaining it, especially if the foot is cold, but that its variability may be great at different times in the same patient I certainly had not seen before.

I have under my care, in the South Devon Hospital, a marine who was sent in by the pension authorities. He was first admitted in December, 1919, with a provisional diagnosis of spinal tumour.

He had over eighteen years' continuous service, with no history of any previous illness. His war service extended for nearly three years, with four months' service ashore at the Cameroons. He complained chiefly of intense pain in the back, with extreme rigidity of his legs which quite prevented him from walking. At night he frequently had "war dreams," in which he cried out and disturbed the ward.

The rigidity was very marked, and I could only flex his knees with the greatest difficulty. The patellar reflexes were very active; ankle clonus was present on both sides; the plantar response was always readily obtained, and was consistently extensor in type. He had anaesthesia extending equally and completely over both legs, but above that sensation

* Read at the Liverpool Medical Institution on October 27th, 1921.

was normal. He seemed to me to correspond fairly well with the cases of astasia one met with during the war.

He gradually recovered, and was discharged in June, 1920, for treatment and training at a convalescent camp. There he remained until one day he had a fall, when all his old symptoms reappeared, and in March, 1921, he was readmitted to the South Devon Hospital. His condition then was by no means so severe as when first seen. The rigidity, however, was still extreme, ankle clonus just as readily obtained, and the extensor response the same as before.

His recovery this time was very slow, and he has only just reached a condition in which he is nearly ready to resume training.

The extensor response for a long time never varied, then as the rigidity of the legs decreased it also became less marked; then it would be present on one side and not on the other; then it would be absent on both sides in the morning, returning if he was tired in the evening.

Treatment has not availed him much. Electricity in all forms failed to help him. Hot-air baths certainly seemed to benefit him, as the rigidity was less after them, and his recovery has been more rapid since they were started.

His war history was not beset with any startling incidents; the only event which has probably had some bearing on his disorder was that once whilst coaling at sea a friend of his had both legs badly crushed.

Meanwhile the man has been discharged by the pension authorities as suffering from disseminated sclerosis, which was neither caused nor aggravated by war service, and I feel that this has been brought about because at one time the plantar reflex could always be obtained, and was consistently extensor in type.

ENCEPHALITIS LETHARGICA AFFECTING THE NUCLEI OF THE MID-BRAIN IN AN UNUSUAL MANNER.

BY

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THE following case is of interest, for though the symptoms were obscure it seems probable that the acute illness in June was an attack of encephalitis lethargica.

A married woman, aged 54, under the care of Dr. McDowell, Belfast, had been healthy and had a healthy family. About the end of June, 1921, she had an acute illness, of which the chief symptoms were vomiting, dirty tongue, etc. This condition lasted a fortnight, and at first no nerve signs were evident. She became weak, giddy, with indistinct vision, which, however, varied. The vomiting stopped, but when she tried to stand she felt giddy, as if falling forwards or backwards. On October 21st the general clinical examination revealed nothing abnormal: the urine was normal; there was no high blood pressure; she was perfectly intelligent, even sharp; the motor and sensory systems were normal. She had no difficulty in finding a word, but considerable difficulty in articulation; she had to force her words, and said "wor" for worse, so that at times her speech was a little confluent, slurred and clipped, and at other moments slightly jerky and nearly explosive. There was a want of tone in the feel of the muscles of the limbs, which hardly seemed to be accounted for by the confinement; the plantar reflexes were absent, the knee-jerks were present but not exaggerated; no other muscle jerks were elicited.

In regard to the eyes, there was a slight droop of both upper lids, but this was said to be natural; the left pupil was larger than the right; both reacted to light and to accommodation somewhat sluggishly. When she looked to the left there was lateral nystagmus, when to the right vertical nystagmus, somewhat slow in character. On November 9th, when she looked to the left, the nystagmus was also vertical; but on looking to the left and a little upward a fine rapid lateral nystagmus was visible. With the ophthalmoscope the discs were found to be normal, but a constant slow, vertical, fine nystagmus was seen. The iris did not show the local shadow reaction test.

Her hearing was perfect; she thought that she heard at times "too much," meaning that she heard what was not intended for her to hear. When she got up she had to hold on to something, like the foot of the bed, and have her other arm taken; deglutition was normal.

The most probable explanation, as has been said, would appear to be that the original attack was encephalitis lethargica. There were no signs of cerebral tumour; she presented no signs of vascular degeneration; syphilis may be excluded by her previous good health, her healthy family, and a negative Wassermann test (blood). The site of the lesion is localized; the cortex down to the internal capsule can be excluded, also the two large basal ganglia, and the cord. The

nuclei in the roof of the mid-brain, with their intricate and complicated ramifications, possibly the red nucleus, and Deiters's nucleus in the medulla, are involved. The connexions between the tectum nuclei, the cerebellum, the vestibular nucleus and so with the semicircular canals, and the many tracts to the cord, would seem to explain the vertigo, the loss of tone of the muscles, the nystagmus of the bizarre type, the unequal pupils, and possibly the ptosis. The speech could be explained by the cerebellar asynergy, and as part of the loss of control of the muscles showing itself subjectively in the vertigo. If Deiters's nucleus be affected the nuclei of the nerves for the muscles of articulation are not far off.

We have an analogy in the condition left by encephalitis lethargica in the globus pallidus, simulating paralysis agitans. In both instances all the cells affected are of the motor type, and so follow the rule.

THE ANTISEPTIC PROPERTIES OF CYANINE DYES.*

BY

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THE group of compounds, a few of which form the subject of the present communication, are known as isocyanines and carbocyanines, and are prepared by condensing a mixture of quinoline or quinaldine alkyl iodide with a quinaldine alkyl iodide in presence of an alkali with or without formaldehyde. These substances are used as photographic sensitizers. Thus the isocyanine known by the trade name of "sensitol green" is produced by the condensation of quinoline methiodide with p-tolu-quinaldine methiodide. "Sensitol red" is produced similarly by the condensation of two molecules of quinaldine alkyl iodide with one of formaldehyde under the influence of alkali. According to Mills and Pope² the constitution of "sensitol red" is represented by the following formula:

To this group of compounds, which have been studied by Mills and Pope and Mills and Wishart,³ the generic name of "carbocyanine" has been given, whilst the "isocyanine" will be represented by the following general formula:

in which R stands for an alkyl group.

Antiseptic properties were determined, as previously described,¹ by adding to 1 c.cm. of culture medium varying amounts of the substances to be tested along with 0.1 c.cm. of a 1 in 1,000 dilution in saline of a twenty-four hour culture of the organisms (*Staphylococcus aureus* or *B. coli*) in peptone water. As test media (a) 0.7 per cent. peptone water with a pH value of about 7.2, and (b) undiluted ox serum (previously heated at 56°C.). The mixtures were then placed at 37°C., and were examined after forty-eight hours for the presence or absence of growth, which was determined in each instance by the appearance of turbidity in the fluid, and also by subculturing a loopful on agar.

The compounds tested were "sensitol red," "sensitol violet," and "sensitol green." These names do not describe the colour of the dyes, but the part of the spectrum to which a photographic plate is rendered specially sensitive after treatment with the compounds in question. Owing to the relative insolubility of sensitol red and sensitol green, stock solutions of 1/2 per cent. of the dyes in 50 per cent. alcohol were prepared, and these were further diluted with water as

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