

findings of Lieutenant Stoddard, however, are extremely important, especially as we are in the "spirochaetal period of medicine" at the present time. A catheter was never employed in my cases, because I consider that warm urine is the best flush for the urethra, and have long discarded catheters, as in my opinion passing "rods" along the urethra is not to be recommended for bacteriological purposes except when circumstances especially demand it.

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"COLLOSOL" COCAINE.

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In April and May of this year statements were published in THE LANCET (April 28th and May 19th) and *British Medical Journal* (May 5th and 19th) which embodied preliminary reports on the above preparation of cocaine by Professor R. Tanner Hewlett, Professor W. J. Simpson, and by Dr. John Eyre.

It was claimed that cocaine in this form retained its local anæsthetic action, but had lost its general toxicity; and the observations described in the reports seemed to afford justification for such a conclusion. If the statement could be accepted, it would obviously have not only practical importance but theoretical interest of a very high order. It did not appear to us to have any obvious relation with the colloidal condition of the alkaloid, which was put forward by the manufacturers in explanation of the anomaly. We decided to investigate the matter further, but our observations have failed to confirm the existence of the suggested disparity between toxicity and anæsthetic power. In the samples which we examined the toxicity was, indeed, much lower than that of an ordinary 1 per cent. solution of a cocaine salt; but the local anæsthetic action was low to a corresponding degree, and both actions corresponded satisfactorily with the proportion of cocaine chemically recoverable from the solution.

It seems desirable to publish our results, in view of the publicity given to the earlier observations. We believe that we can indicate some sources of error in these, and the exposure of a trap in which experienced observers seem to have been caught may always have value for others. We wish to make it clear, however, that we have no reason whatever to doubt the bonafides of the manufacturers, who have withdrawn "collosol" cocaine from their list on hearing from us of our conclusions. Our criticism is concerned with "collosol" cocaine alone among their preparations, though less easily tested claims, made on behalf of other "collosol" alkaloids, should, in our opinion, lose what indirect support they seemed to receive from the earlier observations on "collosol" cocaine. The allegation that a substance is presented in colloidal solution should not be regarded as sufficient ground for a claim that it possesses properties otherwise mysterious or incredible.

On consideration of the earlier reports and of the information given to us by the makers, it appeared that several points required further investigation.

1. The local anæsthetic action should be determined in a more quantitative manner. The degree of anæsthesia produced in the rabbit's eye by a given solution of cocaine varies widely in different animals. We compared the various samples of "collosol" cocaine with solutions of cocaine hydrochloride of known strength, making each comparison by instilling equal quantities of solution into opposite eyes of the same rabbit or into the same eye with a sufficient

interval for complete recovery. The test stimulus was kept uniform and the duration of the different degrees of anæsthesia recorded in each case. In this way we were able to recognise that none of the five samples examined approached a 1 per cent. solution of cocaine (as hydrochloride) in anæsthetic action. Three of them had an action nearly equivalent to that of 0.25 per cent. cocaine, the other two had a much weaker action, so weak that a concomitant irritating effect, presumably due to other constituents, made it impossible to match the activity with that of a pure cocaine solution.

2. The toxicity of cocaine given by intravenous injection varies very widely with the rate at which it is introduced into the circulation. If a solution which is supposed to contain 1 per cent. of cocaine, but in reality contains much less, is injected at the same rate as a standard 1 per cent. solution, the real discrepancy between the toxicities will be very greatly exaggerated. For comparison of toxicities of cocaine solutions by this method all injections must be made at the greatest rate compatible with the avoidance of injury to the heart by mere volume effects.

We chose for tests of toxicity the three samples of which the anæsthetic action corresponded to that of 0.25 per cent. cocaine. One was tested by hypodermic injection into mice, the second by intravenous injection into rabbits, and the third by both methods. Material was not available for very exact determinations, but in every case the lethal dose of the "collosol" sample was four times that of a 1 per cent. solution of cocaine, within the limits of accuracy set by the nature of the test and the number of experiments possible. Two of the preparations appeared to contain some substance which depressed the tremors and convulsions seen with non-fatal doses of pure cocaine, but this action did not appear to raise the lethal dose.

3. The same three samples were examined chemically, the solution being made alkaline with ammonia and shaken with successive quantities of ether. The washed ethereal extracts were united and evaporated and the residue of cocaine weighed. From one sample the cocaine was obtained pure and crystalline, with the correct melting point. The residues from the other two contained traces of non-crystalline material, but had the physiological action of pure cocaine. In each case the quantity of cocaine obtained was approximately 24 milligrammes per 10 c.c. of solution—i.e., 0.24 per cent.

4. Part of one sample was filtered through a wet collodion membrane under a pressure of about 25 cm. of mercury. The colouring matter in the solution was held back by the membrane, the filtrate being quite colourless. The cocaine was extracted from the filtrate and weighed, the quantity found being 23 milligrammes per 10 c.c., or 0.23 per cent. Allowing for the wetness of the membrane, it may be said that the cocaine passes quantitatively through it. The cocaine which is present is, therefore, in the form of an ordinary salt, and is not in colloidal solution.

Conclusions.

1. The local anæsthetic action of three samples of "collosol" cocaine corresponded roughly with that of a 0.25 per cent. solution of pure cocaine. In two other samples it was much lower.

2. The toxicity of the three better samples was about one quarter of that of 1 per cent. cocaine.

3. The quantity of cocaine chemically recoverable from each of the same three samples was approximately 0.24 per cent. instead of 1 per cent. as indicated.

4. The cocaine which was present passed freely through a collodion membrane, and was therefore not in colloidal solution.

DONATIONS AND BEQUESTS.—Aberdeen University will benefit to the extent of some £12,000 under the will of Dr. Archibald Carmichael, formerly of Barrow-in-Furness, and latterly resident in Perth, who died on Feb. 22nd, 1916, bequeathing to the University the residue of his estate, subject to certain life-rents, with the instruction that the income thereof should be applied "for the advancement of the work of the medical side of the University in such manner and subject to such regulations as the Senatus Academicus of the same University may from time to time determine and think fit." Dr. Carmichael was a native of Mary Culter and a graduate in arts and in medicine of Aberdeen University.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF MEDICINE.

Manifestations of Serum Disease which may Follow Intrathecal Injections.

A MEETING of this section was held on Nov. 27th, Surgeon-General H. D. ROLLESTON, R.N., the Vice-President, being in the chair, when short papers were read on the Manifestations of Serum Disease which may Follow Intrathecal Injections. Surgeon-General ROLLESTON'S paper appears in full on p. 821 and Dr. CLAUDE KER'S on p. 822.

Lieutenant-Colonel E. W. GOODALL said that prodromal fever had been noticed after the subcutaneous injection of serum. Fever did occur without a rash and one manifestation might be a temperature without irruption. The proportion of rashes varied with the serum used. No doubt, if the patients who died during the latent period were excluded, 40 per cent. of the remainder would have had rashes. The severity of serum sickness was not nearly as bad as when serum was first introduced.

Dr. J. D. ROLLESTON thought that the severity of the rashes was determined by the size of the dose and varied indirectly to the severity of the attack.

Major C. R. BOX drew attention to the absence of rashes when precipitated antitoxin was used. Numbers of men in the Army had been injected with tetanus antitoxin, and might get cerebro-spinal fever later. What was the likelihood of their getting anaphylaxis? He thought that the percentage of rashes might be linked up with the amount of foreign protein given. Figures from two General Hospitals showed that the rashes only amounted to from 2 per cent. to 5 per cent. of the cases injected, and might be due to the small amount of protein administered as the unitage was high.

Lieutenant-Colonel GOODALL said that the strength of unitage had gone up, but the volume to be injected had gone up also. Many soldiers had frequent injections of antitoxin, but the number who got anaphylaxis was very small.

Dr. R. A. O'BRIAN also spoke, and Surgeon-General ROLLESTON briefly replied.

SECTION OF OTOTOLOGY.

Exhibition of Cases and Specimens.—Gastro-intestinal Sepsis a Cause of Ménière's Symptoms.

A MEETING of this section was held on Nov. 16th, Dr. H. J. BANKS DAVIS, the President, being in the chair.

On the proposition of Mr. HERBERT TILLEY, seconded by Dr. WILLIAM HILL, a cordial vote of thanks was accorded to Mr. H. J. MARRIAGE, the retiring President.

The new PRESIDENT, in the course of an address, reminded members of the section, who were all specialists, that its proceedings were widely read by medical men who might not have the same opportunities as they themselves had for acquiring a special knowledge of otology. He said that because there was a tendency to report upon and exhibit at these meetings only cases of rare or special interest which might exclude much information concerning types of cases commonly met with. The experience of all was worth recording, though everybody's opinions might not be. He regarded it as a duty of the section to promote knowledge among the general body of the profession. The subject of special debate for the winter would be "The Influence of Abnormalities and Diseases of the Nose on the Ear," a topic which had an important bearing on aviation, as flying men with nasal obstruction were liable to be handicapped by disturbances of equilibration when flying. In a minor degree this applied also to gunners in the naval and military services. Other aspects of the specialty calling for further investigation included the best after-treatment following operations on the mastoid, the best treatment for shortening the duration of Eustachian catarrh with simple catarrhal otitis media (a common condition during the war), the alleviation of the symptoms of otosclerosis, how these can be distinguished from those of chronic adhesive catarrh, and tinnitus, "the bugbear of otology."

The PRESIDENT showed a green pea which he had extracted from the middle ear of a boy aged 10 years.

Examination of the ear in the casualty department revealed nothing, but as facial paralysis supervened the patient was admitted into the hospital, and Dr. Davis, by the post-aural operation, extracted the pea, with husk complete, which had swollen to the size of a hazel nut.

Mr. E. D. D. DAVIS showed a case of war injury to the ear, due to a shell wound of the left malar region, which also destroyed the sight of the left eye. Granulation tissue was present in the left external auditory meatus and a healing perforation of the posterior inferior quadrant of the drum. The loss of hearing was considerable and likely to be permanent. He did not think the deafness was functional.—Dr. PERRY GOLDSMITH considered there was a functional element in the case, as he could not understand why a wound in the position mentioned should have destroyed the man's drum.

Mr. SOMERVILLE HASTINGS showed a case of cholesteatoma which exposed the lateral sinus. The patient, a woman aged 33, seen last July, gave a history of chronic discharge from the right ear for eight years, and pain in this ear during the last few weeks. She had never had an operation on the ears. The right ear was filled with pus and epithelial debris, and removal of this disclosed a large smooth-walled cavity, all trace of the membrana tympani and ossicles being lost. The lateral sinus was exposed for half an inch and could be seen pulsating. Hearing in this ear was very defective. There was no need to operate here, as Nature had operated.—Dr. HILL drew attention to the fact that sometimes the lateral sinus was situated in a forward position, a possibility which surgeons should have in mind during ear operations.—The case was fully discussed.

Mr. W. M. MOLLISON showed a man, aged 21 years, with complete deafness and almost complete loss of labyrinth function.—Mr. J. F. O'MALLEY, suspecting the case to be functional, detailed the plan which he had successfully followed in detecting and curing such conditions.—Mr. SYDNEY SCOTT mentioned the means carried out at the National Hospital for the Paralysed with the same object.

Major E. B. WAGGETT sent a short contribution on a case of Myasis of the Ear. It was due to the flesh-fly, *Sarcophaga carnaria*, specimens of which accompanied the paper.

Mr. T. MARK HOVELL read a paper on Gastro-intestinal Sepsis a cause of Ménière's Symptoms. He said that outside the ranks of otologists there was a tendency for patients suffering from the group of symptoms which Ménière described to be regarded as having incurable ear disease. The paper dealt only with cases in which patients had middle-ear disease and in whom the reason of the symptoms was not apparent. Many of the patients benefited had the following conditions present when first seen: furred tongue, congested pharynx, naso-pharyngeal catarrh, hypertrophic rhinitis, flatulence, frequently considerable distension, constipation. The blood pressure was usually high, sometimes the heart was dilated, and the Eustachian tubes were in most cases closed. Considering the high blood pressure, the presence of tinnitus and giddiness was not to be wondered at. He had directed his attention to remedying the gastro-intestinal condition, to obtaining specimens of stomach contents during fasting, and the preparation therefrom of a vaccine as adjuncts to treatment. No measures for reducing blood pressure would succeed unless the intestinal tract were restored to a healthy condition, towards which the giving of full doses of castor oil was a great help. Locally, the injection of air into the tympanum lessened the Eustachian distress, but for permanently restoring the patency of those tubes the best measure he knew was the injection into them through a catheter of a few drops of collosol argentum, which should reach the tube in the form of a spray. To lessen the naso-pharyngeal catarrh, collosol argentum, or collosol iodine was useful, sprayed directly backwards through the nostril. The first of these remedies he had also found useful for relieving earache. Collosol preparations should not be given in conjunction with arsenic, as poisoning might ensue.—The paper was discussed at length.

The report of the Committee of Otological Research was presented to the meeting, and the members of the committee—Mr. Marriage, Mr. E. D. D. Davis, Mr. Somerville Hastings, Dr. Fraser, Dr. A. Gray, Mr. Hugh Jones, Sir William Milligan, and Mr. Sydney Scott—were cordially thanked for their labours.