tion of temperature was 1.7° F. Deducting the first 15 minutes of the period of observation (during which the temperature was not only unreduced, but even continued to rise) the rate of fall was at the rate of 0.1° for every 7.05 minutes occupied.

Here the rate of fall was even more irregular than in the preceding two series; during two periods of respectively 10 minutes and 5 minutes the temperature actually increased (although the subsequent fall was almost to the point which would have been attained had the intercurrent rise not occurred), and there was a stationary period of 5 minutes. During the last half-hour of the observation the rate of fall was very regular indeed, being at the rate of 0.1° during every 5 minutes.

We note:

1. The rapidity of absorption of the quinine, although only given as a powder suspended in milk. In the first series of observations, the temperature began to fall within 49 minutes, probably in a shorter time; in the second series within 20 minutes, and in the third series within 22 minutes. So that Liebermeister's statement that "the decline of temperature usually begins a few hours after taking the medicine" is decidedly an overstatement of the time occupied in producing a commencement of fall of temperature.

2. The size of dose, within certain limits, does not seem to affect the rapidity of the defervescence. In the preceding cases, we have respectively doses of 20 grains, of 40 grains, and of 20 grains administered with average result in the respective instances of 0.1° decrease for every 7.59 minutes, for every 9 minutes, and for every 7.05 minutes. The mean of the three series giving a result of 0.1° decrease of temperature for every 7.88 minutes occupied by the experiment.

3. There are four methods in which the antipyretic effects of the quinine might be thought to act: (a) By a destruction of pathogenic bacteria; (b) by a neutralisation of their resulting toxins; (c) by an interference with the heat-regulating centres; and (d) by producing diaphoresis. The destruction of pathogenic bacteria is negatived by the fact of the merely temporary nature of the defervescence which follows the administration of quinine. A destruction of bacteria would produce a permanent curative defervescence, not a merely temporary one. Moreover, we have no experimental proofs that a diluted solution of quinine of the strength of 20 or 30 grains of the drug dissolved in a bulk of fluid equal in volume to the whole of the blood of an individual, would exercise a particularly lethal effect on Eberth's bacillus. It is highly improbable that quinine in whatever strength would neutralise the chemical products of the typhoid bacillus, since they appear to bear no chemical relation to each other. There remain, therefore, only the two probable methods of action—on the heat centres and on the sweat centres. It seems improbable, if the heat-centre theory be true, and if my observations are, as I believe them to be, accurate, that the proportional rate of decrease of temperature after exhibition of the drug should be so irregular as it is, and that its speed should not be affected by the amount of dosage. A drug acting directly on a nerve centre might be expected to produce an immediately great and regular effect on its function which would be expected to agree in rapidity of action with the size of the dose administered.

If, however, we accept the last or diaphoretic theory of defervescence when produced by antipyretic remedies, it would explain many of the difficulties of the question. Since defervescence by diaphoresis depends upon the sweating itself and not upon its causation, it is obvious that the size of the dose of the drug administered, so long as it was sufficient to produce perspiration at all, would have no effect on the speed of the resulting defervescence. Since slight movements in bed by which the surface became chilled would temporarily stop the diaphoresis, the stationary and even regressive intervals during the period of falling temperature would be quite explicable on such grounds. Moreover, most, if not all, of the antipyretic group possess one quality in common, when administered for reduction of temperature in efficient doses: they produce violent diaphoresis, which also occurs in the night sweats produced by the toxins of the tubercle bacilli, which are in like manner succeeded by a normal or sub-normal temperature.

REFERENCE.

1 H. von Ziemssen, *Cyclop. of Med.*, i, 214.

THE BROMIDE SLEEP IN A CASE OF MANIA.

By PHILIP M. RAGG, M.B., C.M.,
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I LATELY attended, in private practice a case of mania in which resort to the bromide treatment, as advocated by Dr. Neil Macleod,¹ gave excellent results.

The patient, a young Englishman, had been for eight hours in a state of alternating exaltation and depression when I was first summoned, the exciting cause being domestic and pecuniary worries of no great magnitude. He had taken at one dose forty 2-gr. quinine pills, with the avowed intention of committing suicide. Profuse sweating, headache, nausea, and prostration, with a temporary mitral systolic murmur resulted; and, though in a state of great mental excitation, his physical discomfort rendered him at first very amenable to treatment. For the first four days 20 grs. of sulphonal with 30 grs. of ammonium bromide were administered every twelve hours. After each dose he slept for some hours (as much as eight on the second night), but with incessant movements of the limbs and changes of position. He ate heartily, but in the intervals the mental exaltation increased, and he suffered from restlessness and delusions that made him difficult to manage. Thus on the third day, after a four and a-half hours' sleep, during the absence of the one available trained nurse, he gave his watchers the slip, and I arrived just in time to intercept him in the street, 100 yards from home, in a state of great excitement, staggering like a drunken man, singing at the top of his voice, and accosting passers-by.

On the fourth evening he attacked me furiously under the delusion that I was robbing him of his wife, to whom he is much devoted, when I sent her exhausted to rest in an adjoining room. On the fifth day, being anxious to keep him, if possible, out of the asylum, and after consultation with the medical superintendent of the institution, I determined to try the effect of the bromide treatment. In order to allow the effects of the sulphonal (last administered at 1 A.M.) to pass off, the new treatment was not commenced till 4 P.M., when he was again in a state of great exaltation, talking incessantly, with bursts of maniacal laughter. Potassium bromide in 2-drachm doses was then given at 4, 6, and 8 P.M., followed in each case by a tumbler of milk. At 9.15 P.M. he was apparently in a deep sleep, but as preparations were being quietly made for his wife's return to the next room for the night, he got up in bed, and with many invectives threatened to "do for me." He fought furiously for about thirty seconds, and then fell back exhausted. On assurances being given that she should remain in the room he became tractable, but a quarter of an hour later tried to follow me downstairs to "square me in the open." At 10 P.M. 3 drachms of potassium bromide were given, and after an hour's incessant talking, in which he was profane and witty by turns, and extravagantly lauded his wife's personal charms, he got eight hours' sleep.

On the sixth day the potassium bromide was given, in 2-drachm doses, at 8 and 10 A.M. and 12, 2, and 4 P.M., followed in each case by a tumbler of milk, giving a total of 10 drachms of bromide in the twenty-four hours. The early administration was due to his refusing to remain in bed and being intractable in the morning. From 10 A.M. onwards he slept soundly, and required some rousing for the two-hourly draughts. There was slight difficulty in swallowing, but he drank from a tumbler and assisted in holding it. He got up without suggestion during the day to obey the calls of Nature. At 6 and 8 P.M., after being roused to take milk, he became restless and loquacious.

On the seventh day, having had fairly deep sleep through the night, at 5.30 A.M. he got out of bed to pass water, then fell into deeper sleep, which continued throughout the day with little muscular movement. He lay with eyes half open and glazed, mouth wide open, breathing somewhat stertorously. He was roused every two hours to take milk; he recognised those who gave it, always looked across to his wife, smiled, spoke affectionately in a thick voice, and went off at once to sleep. His tongue was covered with a thick white fur, and his temperature was normal throughout the progress of the case. At 4 P.M., when his wife was speaking to me at the door, though apparently in profound sleep, he roused himself—suspicious, as always when she moved—swore violently at me for my "intention of removing her," struggled hard for a few moments, and, quickly exhausted, went off to sleep again.

During the whole of the eighth day he slept profoundly, even more so than on the seventh. His face was pallid and somewhat leaden in hue; he took milk as before, but with more difficulty in swallowing, so that on three occasions he was fed with a spoon. He got out of bed once to follow his wife when she left the room; however deep his sleep, he seemed to wake instinctively if she left him.

On the ninth day he had deep but more natural sleep.

On the tenth day, having slept well all night, he was easily roused, and took a light breakfast with relish, but he had difficulty in swallowing. He slept the greater part of the day and was always drowsy. There was no extravagant behaviour whatever except insisting on kissing the nurse, and he allowed his wife to leave the room at intervals without suspicion or demur.

On the eleventh day, after a good night, he was rational and very amenable to treatment. He was extremely weak, but walked with assistance round the room, when he was content to go back to bed for the rest of the day, feeling "tired." He slept most of the day.

On the twelfth day he left the bedroom for the first time, and shaved himself well. His tongue was still very foul. His mental state had returned practically to his normal, which is that of a restless, excitable, and rather self-willed individual. From this time onwards there has been a steady return of physical strength, and he has been rational in his behaviour, but easily affected to tears for the first few days by a sense of his inability to work, by acts of kindness, and occasionally when not allowed to act on his own judgment.

In the treatment of this case the drug was not pushed to the extent advocated by Dr. Neil Macleod, as after a twenty-

four hours' cessation I judged further administration unnecessary. Still it seems remarkable in view of his reports that the patient, after the heroic doses given, responded throughout without suggestion to the calls of Nature, and was able so obviously to keep jealous watch, waking or sleeping, over the movements of his wife. The statement that "the full effect of the drug is not manifest for at least twenty-four hours after the last dose" is well borne out. With regard to this method being "a new departure in the treatment of acute mania," I would refer to Clouston,² when he says: "I have used the bromide alone in acute mania extensively and experimentally. In small doses it seems to have no effect. In very large and continuous doses, say a drachm every three hours, continued for many days, it will cause bromism and quiet the patient; but when its influence is over he becomes as bad as ever. I have never seen any medicine where the maniacal excitement and the physiological brain torpor of the drug seemed so visibly to fight for the mastery." It would appear from this that the same quantity of the drug per diem is more potent when given in larger doses at shorter intervals.

REFERENCES.

¹ BRITISH MEDICAL JOURNAL, January 20th, 1900. ² *Mental Diseases*, third edition, 1892, p. 171.

THE TREATMENT OF THE PAROXYSMAL STAGE OF WHOOPING-COUGH.

By JOHN EDWARD GODSON, M.R.C.S., L.R.C.P. LOND.
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THE following drugs have been mentioned as of service in the treatment of this disease: Alum, antipyrin, acetanilide, belladonna, bromides, cannabis indica, carbolic acid, chloral hydrate, creosote, lobelia, opium and its derivatives, phenacetin, quinine, etc. This list, on account of its prodigality, is confusing to the novice, and appears to show that there is a considerable difference of opinion with regard to the correct treatment of pertussis. In the early months of the year I sent round a circular to a number of general practitioners in the hope of obtaining an answer to the following questions: Are all these drugs in actual use? Which drugs are considered to yield the best results? Which drugs are most frequently employed? An examination of the answers to this circular furnished the following conclusions: The list of drugs is considerably diminished. Those commonly employed and chiefly depended upon are antipyrin, belladonna, bromides, carbolic acid, creosote, and opium. While as accessory and occasionally useful drugs are mentioned chloral hydrate, quinine, butyl-chloral-hydrate, etc. The antispasmodics are always combined with expectorants, of which the alkalies are the greatest favourites. Inhalants appear to be in general use, the ones referred to being carbolic acid, creosote, bromoform, and chloroform. None of the other drugs in the first list have been employed by my correspondents. The relative popularity of the various drugs is as follows: Belladonna, 32 per cent.; carbolic acid, 28 per cent.; bromides, 20 per cent.; creosote, 12 per cent.; antipyrin, 6 per cent.; opium, as paregoric, 2 per cent. These results, while not pretending to be authoritative or exhaustive, are interesting as coming from a good representative group of general practitioners.

None of the answers I received were enthusiastic except from those who had used creosote. This remedy was strongly praised. It appears to have little effect when given internally, and must be used as a vapour. The results obtained are far more satisfactory when the inhalation is continuous than when it is intermittent. The simplest and best method is to sprinkle the drug on a cloth, and hang the cloth in the nursery or sick room to dry. In this way a highly-impregnated air can be constantly supplied to the patient. Many other methods can be employed, but none are so satisfactory as this. The inhalation appears to be free from danger except where the chest is full of moist sounds, in which case its effect should be carefully watched.

The method of treatment I have found most satisfactory is the following: Commence at once with the continuous inhalation of creosote. Clear the lungs of bronchitis as much as possible before using any special internal antispasmodic remedies. In broncho-pneumonia, however, belladonna appears at once to do good. In all cases, if or when the chest is

fairly clear, and the circulation good, antipyrin may be given in suitable doses. Expectorants should be combined with the antipyrin. Good air, warm clothing, light, and wholesome food are necessary in all cases. I have followed these rules for the last six years, and am quite satisfied with the results. The average length of time required for cure in a variety of cases last year was 19.8 days, but these figures in no way represent the benefit derived from the creosote treatment. In every case the diminution in the numbers of paroxysms was so immediate that the patients willingly put up with the inconvenience of the smell of the drug for the sake of its manifest advantage. This in itself is a sufficient testimonial to the remedy to warrant its more extensive employment.

MEMORANDA:

MEDICAL, SURGICAL, OBSTETRICAL, THERAPEUTICAL, PATHOLOGICAL, Etc.

ABDOMINAL WOUND INFLICTED BY A RHINOCEROS.

On March 11th I received a telegram asking me to see a man who had been severely wounded by a rhinoceros about eighteen miles away. I was unable to get to the spot until about 11 P.M., the accident having occurred about twelve hours previously. The patient was a Soudanese orderly belonging to the Uganda Rifles. He was a man of about 40 years of age. After the injury had been inflicted, he had to walk about 2½ miles to get into camp. Everything in the way of examination and treatment had to be done in a bush tent, by the aid of the light from a couple of hurricane lamps, and without any experienced assistant. The abdominal wound was in the left inguinal region, occupying the anterior abdominal wall for a length of about 6 inches, about 2 inches above, and almost parallel to Poupart's ligament. Protruding beyond the wound, and resting on the adjacent parietes, were several knuckles of gut, all bloodstained, and looking very ragged. The visceral peritoneum was hanging in shreds but there was no perforation of the intestine visible.

I enlarged the original wound, so as to allow an examination of the gut above and below the protruded portion, and also to give a freer access to the abdominal cavity. The intestine thus brought into view appeared quite normal. Doubtless the injected appearance of the external knuckles was largely due to the severe constriction they were subjected to by the edges of the wound interfering with the venous return. I thoroughly cleansed the protruding gut, as well as the adjacent portions. The abdominal cavity, as far as I was able to make out, did not show signs of extravasation into it. I next carefully loosened the parietal peritoneum from the subjacent transversalis fascia, the delicate layer of extraperitoneal fat rendering this comparatively easy.

The protruded knuckles were now carefully returned, and the parietal peritoneum of either side was brought together by sutures, the muscles were brought together by another set of sutures, and the skin and superficial fascia of either side were drawn together by a third line of sutures. The wound was dressed antiseptically, and I placed a firm pad over it, to resist as far as possible the pressure of the internal viscera on this weakened spot. On the buttock of the same side there was a deep wound, evidently inflicted by the second horn of the infuriated beast. This was dressed and a dose of opium administered. Unless any alarming symptoms should supervene, I asked his commanding officer to have him carried to the station in forty-eight hours, and by train to Makindu Hospital, where I could have him directly under my care.

In two days the patient came to hospital appearing to be in very good spirits. There was no pyrexia. The abdominal wound was healing perfectly; the action of the bowels was regular, and there was no pain over the wounded region. Progress from this time onwards was very rapid, the patient being discharged on March 21st, eleven days after the accident.

I would have kept him longer, but he appeared at the door of my hut on the morning of March 21st whilst I was at breakfast, and expressed a wish to return to his duties. Before leaving I got a rough tuss made with a large pad to rest on