OBSERVATIONS

ON THE

ACTION AND USES OF CROTON-CHLORAL HYDRATE.

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I HAVE the honour of directing attention to a new remedy, which serves to corroborate the theory I have propounded with respect to the action of hydrate of chloral.

When chlorine gas acts on aldehyde, croton-chloral is formed, as has been demonstrated by Dr. Krämer and Dr. Tinner. In order to avoid a mistake which is apt to be caused by the name, I must here remark that this body possesses no relation whatever to croton-oil, although its chemical constitution proves it to be the chlorated aldehyde of crotonic acid. Croton-chloral differs in its outward appearance from hydrate of chloral, by its being dissolved with difficulty in water, and by its crystallising small glittering tablets. Its action, though similar to that of hydrate of chloral, differs widely from the latter with regard to its physiological effects. Four *grammes*, or a drachm, of this substance, dissolved in water, and introduced into the stomach, produce in the course of from fifteen to twenty minutes a deep sleep, accompanied by anæsthesia of the head. Whilst the eyeball has lost its irritability, and the nervus trigeminus shows no reaction whatever on being irritated, the tone of the muscles remains unaltered.

I have experimented with this remedy on maniacs during an attack of mania. They remained quietly sitting on their chairs in a deep sleep, their pulse and respiration being unchanged for two whole hours together. If anæsthesia had reached so high a degree in consequence of the application of hydrate of chloral, the patients would have dropped from their chairs, and both their pulse and respiration would have been considerably retarded. I have seen croton-chloral acting in the same way on healthy individuals. In some cases of tic douloureux, the remarkable phenomenon is exhibited that pain ceases before sleep sets in. I am sorry to say, however, that this remedy acts only as a palliative in this dreadful disease. I nevertheless prefer its action to that of morphia, because it has effects as good as the latter remedy, without being so detrimental to the constitution in general. I have never observed any unfavourable effects of croton-chloral on the stomach or any other organ, although I have made frequent experiments with it.

The indications for the use of this remedy are to be found—1. In cases where hydrate of chloral is inapplicable on account of heart-disease; 2. In cases of neuralgia in the district of the nervus trigeminus; 3. In cases where very large doses of chloral are necessary to produce sleep. I there recommend the addition of croton-chloral to hydrate of chloral.

Whilst examining the difference between the action of hydrate of chloral and that of croton-chloral, I have discovered the remarkable fact that it is not the first, but the second, product of decomposition of the latter substance which is brought into action, on account of the first being too rapidly destroyed. Croton-chloral, when subjected to the influence of an alkali, first forms allyl-chloroform, a trichlorated body, which is rapidly decomposed into a bichlorated substance called bichloro-allylene. Now, both chloroform and trichlorated substances act, as I have shown, in their first stage on the brain, in the second on the spinal cord, and in the third on the heart. The retardation of respiration is to be explained by the agency of these substances on the last mentioned organ. Bichlorated substances act differently, as is proved by bichloride of ethylene. Even if the circulation of the blood in an animal have been stopped by this latter agent for one minute, life may be restored by artificial respiration, which is impossible whenever trichlorated substances have produced this effect, in which case the muscles of the heart remain paralysed. Well, in animals poisoned by croton-chloral to such a degree that both circulation and respiration are stopped entirely, artificial respiration is able to restore the action of the heart immediately, and the life of the animal may thus be saved. Bichloro-allylene, inhaled by the lungs, produces the same effect on animals as croton-chloral. We thus see these bichlorated substances acting on the brain, spinal cord, and medulla oblongata, but not on the heart, which explains the fact that both respiration and circulation remain unaltered

in man by a medicinal dose. It is a highly interesting fact, however, that under favourable conditions, we still are able to produce in animals the effects of the first product of decomposition of croton-chloral—i.e., of the trichlorated substance or of allyl-chloroform. In order to observe these effects, it is necessary to introduce immense doses of croton-chloral into the body, when paralysis of the heart actually does ensue.

CURRENT VIEWS

ON THE

TREATMENT OF STRICTURE OF THE URETHRA.

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IN no affection which comes under the notice of the surgeon has so much mischief been done, in the way of treatment, as in stricture of the urethra; no instrument has, in practice, been so much abused as the bougie or catheter. An eminent and very skilful surgeon is reported to have said, in his blunt, forcible manner, that "more people are bungled out of their lives in the treatment of stricture than in any other way;" and another distinguished surgeon, not given to rash expression, affirmed that, "had bougies never been invented, it would, on the whole, have been a great gain to humanity." Whether one is prepared to endorse these opinions or not, the fact that they have been formed by observant and experienced men renders them worthy of serious attention. Nay, let anyone, who has seen much of surgery, recall what he has witnessed in the treatment of stricture by the employment of instruments, and reflect on the result. There is, in truth, a wide difference between actual practice and what is called the literature of the subject—a difference embarrassing to the practitioner and mischievous to the student. Records of rapid and complete cures of stricture by all sorts of mechanical means are abundant enough. Each of the very many plans of treatment which have been extolled is reported to be successful beyond any other—the one means by which the most obstinate strictures may be satisfactorily cured. But, if a surgeon of the largest experience were asked, how many cases of complete and permanent cure of bad organic stricture, by mechanical means of any sort, he could recall, what answer must he give? Is not the history of the subject strongly suggestive of another question? Are the views which have been, and are even still current of the pathology of stricture of the urethra sound ones? No doubt, in this case, practice has been worse than precept; but surely, even in what has been written on the subject, too mechanical a view has been taken of the nature of the disease. Of course, in our books, different forms of stricture are described as occurring either alone or in combination. We read of organic, inflammatory, spasmodic stricture, and so forth; but what is the impression left on the mind of anyone by the perusal of any treatise on the subject? That the treatment of stricture, in the great majority of cases, must be by mechanical means of some sort; by the employment of instruments. All other means, short of the use of instruments, are represented as exceptional or subordinate. But, in practice, matters have been, and still often are, far worse. Here, not unfrequently, the introduction of instruments constitutes the sole means of treatment, and, even when other measures are suggested, they are not often insisted on as of much importance.

This comes of the current view of the nature of stricture. Ask any advanced student or young surgeon, whose acquaintance with the subject of stricture is necessarily, for the most part, second-hand, what he understands by the term. He may, or may not, mention, in passing, the various causes of stricture; but it will soon become evident that his idea of stricture is simply a mechanical one; that stricture of the urethra is, to all intents and purposes, a constriction of a portion of the canal, due to thickening and contraction of a deposit in its walls, just as any tube or pipe may be blocked up, to a greater or less extent, by foreign matter; and the worst of this is, that it at once suggests to him the notion of treatment by purely mechanical means; that the obstruction must be overcome by force, either gradually and more cautiously by the repeated application of less force, or rapidly and violently by the sudden application of much force. Stricture of the urethra is too often regarded as a simple physical condition, to be treated only by physical means. But, even when a somewhat larger view is taken of the subject, when other means are employed, they are too often regarded as merely subsidiary or preparatory to the chief one—the dilata-