SCIENCE.

FRIDAY, APRIL 8, 1887.

COMMENT AND CRITICISM.

THE DISCUSSIONS as to cocaine and its effects proceed with vigor, and, while no consensus of opinion seems to have been arrived at by medical authorities, yet the number of cases of the use of the drug that have been observed and studied is rapidly increasing, and will afford the ultimate investigator a large amount of material to go over. The Brooklyn physicians have lately taken a public stand in the matter, based on a paper by Dr. J. B. Mattison, which emphatically opposes the views expressed by Dr. Hammond and others, which have been heretofore commented on in these columns. The action of the Brooklyn physicians takes the form of the draught of a bill to be presented to the legislature, which places cocaine on the list of poisonous drugs to be sold only on a physician's prescription. In his paper, Dr. Mattison says that "no advent in the therapeutic arena during the last decade has been attended with such varied and extensive claims for favor as cocaine. Its marvellous effect in ophthalmic surgery roused a spirit of experimental research in other directions which has added largely to its well-proven power for good; but a potency for good implies a potency for harm, and the risk impends of its ardent advocates being carried by over-enthusiasm beyond the limit of a safe regard for the welfare of their patients or themselves that may imperil an otherwise well-founded success." He believes that the time has come when the evidence justifies a strong statement of the harmful effects of the drug; and, in combating Dr. Hammond's views, Dr. Mattison adduced fifty-one cases of the use of cocaine which attested a power in the drug, on some patients, that warrants caution with all.

Of the cases brought forward by the speaker, one was that of a young woman, twenty-three years of age, who died from an application of cocaine made during an operation for the removal of a tumor in the intestines. Another was the case of a man, aged thirty-three, to whose larynx a four-per-cent solution of cocaine was applied, and who died from cocaine-poisoning after the second application. A third was the case of a woman in middle life, whose death resulted from the use of a four-per-cent solution for tooth-ache. Numerous cases were given of the poisoning resulting from the use of cocaine as an anaesthetic in surgical operations. Among the effects noted were depression of the brain, profuse sweating, impending syncope, difficult respiration, twitchings of the muscles, mania, paralysis of the heart, nausea, rigors, and so forth. Dr. Mattison further insisted that Dr. Hammond's assertion that there is no danger of cocaine addiction because he himself took half a dozen doses at intervals of from one to four days without 'acquiring a habit,' is valueless as evidence, because "cocainism is not the outcome of using the drug at long intervals. Its transient effect and the demand of an impaired nerve status compel frequent taking, — more than alcohol or opium, — so that habitués have been known to take it ten, twenty, or more times daily; and it is this — growing by what it feeds on — that tends to create and continue the disease." Dr. Mattison's own professional experience has proven for him two things, — first, that cocaine *quiâ* cocaine possesses a pernicious power; and, second, it finds in the opium-taker a peculiar condition that specially favors its ill effects, making it for such patients peculiarly dangerous. In concluding his paper, the writer summarized thus: "Cocaine may be toxic, sometimes deadly, in large doses. It may give rise to dangerous or even fatal symptoms in doses usually deemed safe. The danger, near and remote, is greatest when given under the skin. It may produce a diseased condition, in which the will is prostrate and the patient powerless, — a true toxic neurosis, more marked and less hopeful than that from alcohol or opium.

Dr. Crothers, in the *Medical and surgical reporter*, gives the following statement of his views on cocaine: "Among alcohol inebriates and drug maniacs, cocaine inebriety is no doubt increasing. Its peculiar dangerous effects on the body will prevent its general use as an intoxicant to any great extent. It acts more rapidly than opium, but its effects pass off more quickly. Its first ef-

fect is more exhilarant than that of alcohol, but it is uncertain and variable. This stimulant action develops mania, followed by narcotism and melancholia. As an intoxicant, it is more dangerous than alcohol or opium. As a form of inebriety, it is more difficult to treat, requiring a longer time to break up, because of the physical and psychical complications. It cannot be used as a substitute for any other narcotic, or as an antidote or remedy." Dr. Hammond of New York finds, as the result of personal experience with cocaine, that two grains in a pint of wine produced all the beneficial and none of the deleterious effects of the drug. One grain injected hypodermically has an effect similar to that of two or three glasses of champagne. He thinks that cocaine has a refining and softening effect, while the tendency of alcohol is to lower the mental and moral tone, and to brutalize a man. Three grains produced a great disposition to talk, with vivid imagination. Writing was accomplished with great ease, and wonderful progress was made with a medical work which he was preparing. On the following morning he found the work to be composed of incoherent sentences and disconnected ideas, being utterly nonsensical. He subsequently took eight grains of the drug, which produced painful sensations.

Dr. Frank H. Bosworth of New York has had considerable experience with cocaine. He says that in no single case of hay-fever which he has treated with it has he been able to detect any distressing reaction from its use. In a few cases the remedial effect has not been such as desired, but the proportion of such cases has been small. He has used cocaine in a hundred and fifty cases, and in but two was there any reaction, and in neither was this of a distressing character. Many patients have used the drug daily for eighteen months without any reaction, and without there being any toleration created, the same effect following its use at the end as at the beginning of the period, — complete relief. Being a sufferer from hay-fever, the doctor used the drug himself, applying it, in a solution of four per cent, to the nose. The relief was immediate and great, but lasted only from two to three hours. He used it frequently during the day in this way, at the beginning using from two to three grains daily. After using from half a grain to a grain, he experienced the full constitutional effects of the drug, which were a feeling of absolute peacefulness and repose, entire immunity from worry or care, thorough wakefulness, or, rather, alertness of intellectual faculties, with something of an indisposition to exertion. Together with this was an enjoyment of his cigar such as he had not experienced since he was a young man. In this way he would sit and smoke and read hours at a time. He soon found that he was taking from five to eight grains of cocaine daily. At night he would fall into a refreshing sleep, and awake in the morning without an unpleasant symptom. After breakfast, his hay-fever symptoms coming on, he would resume his cocaine. This he continued for more than two and one-half months; at one time, in order to test the drug, carrying the quantity as high as twenty-five grains between dinner and bed-time. In all, he used about an ounce of the alkaloid. His conclusions are as follows: 1°. The use of the drug produced no tolerance: two grains produced as marked a constitutional effect as twenty-five. 2°. No cocaine habit was contracted. At no time from the commencement of the experiments to the end of them was there ever the slightest craving for it. 3°. The local effect at the end of three months, in contracting the blood-vessels of the nose, was as quick and as efficient as at the time of the first application. 4°. There was not at any time the slightest local reaction following its use. 5°. In not a single instance was he able to detect any constitutional reaction after its effect passed away.

We were in error last week in reporting that the sum of $400,000 had been appropriated by congress for the erection of a new naval observatory near Washington. The amount actually available is but $100,000, with the understanding that the entire cost of the work shall not exceed $400,000. Mr. Hunt of New York, the architect appointed by the secretary of the navy, has been in Washington examining the site, and consulting with the superintendent of the observatory and Professor Hall, and it is understood that he is now at work upon the detailed drawings. Plans were prepared some seven years ago under the direction of Admiral John Rodgers, then superintendent of the observatory, but they will be very largely modified in order to isolate more effectively the observing-rooms from the main building. Ensign Winterhalter of the U. S. naval observatory has sailed for Paris to represent the observatory at the

conference called by Admiral Mouchez, director of the Paris observatory, for the purpose of forming a plan of co-operation in photographing the whole sky. The proposition is to enlist ten or twelve observatories in the undertaking, and to obtain instruments of uniform power, so that their work may be homogeneous. If the suggestion that each plate shall be four degrees square is adopted, about 11,000 plates will be required; and, with an average of 100 plates per year from eleven observatories, it will take ten years to complete the map. It is understood that Dr. Peters of Clinton, and Mr. Rutherfurd of New York, will also attend the conference.

A VERY VALUABLE CONTRIBUTION by T. Mitchell Prudden, M.D., on bacteria in ice, and their relations to disease, with special reference to the ice-supply of New York City, appears in the *Medical record* of March 26. In a series of thirty-two biological analyses of the Croton water, as it is delivered in the city, Dr. Prudden found the lowest number of living bacteria to be 57 to the cubic centimetre; the highest, 1,950; while the average was 243. While it was at one time thought that the presence of a considerable number of living bacteria in a water was evidence of its being unfit for drinking-purposes, we have now learned that this view must be greatly modified. Bacteria are almost everywhere present, in soil, air, etc., and by far the larger proportion are, so far as we know, perfectly harmless. Their *rôle* in nature is to tear down organized bodies into their simpler constituents, a small part of these being used for their own nutrition and growth, while the larger part is given up to other organisms for their life-purposes. It still remains true, however, that a certain number of species, which can live in water as well as elsewhere, can and do produce deadly diseases, and are responsible for some of the most frightful epidemics.

Dr. Prudden made a series of experiments to test the effect of freezing on the bacteria. His method was as follows: a large number of test-tubes were plugged at the mouth with cotton, and sterilized. Into these tubes was put sterilized water mixed with a small quantity of a pure culture of some well-defined species of bacteria, the number of bacteria in one cubic centimetre of water having been previously determined. The tubes were then exposed to a temperature of from 14° to 30° F., the water becoming solid in a short time. Six different species of bacteria were thus experimented with: 1°. Bacillus prodigiosus; 2°. A short bacillus frequently found in the Hudson River water, and occasionally in the ice, apparently identical with the Proteus vulgaris of Hauser; 3°. A slender bacillus very common in Croton water; 4°. Staphylococcus pyogenes aureus, derived from a case of pyaemia; 5°. A short bacillus very common in ice all about New York, which may be designated the 'fluorescent bacillus,' from its appearance in gelatine; 6°. The bacillus of typhoid-fever. In the case of the Bacillus prodigiosus, there were 6,300 bacteria in a cubic centimetre of water before freezing; after being frozen 4 days, 2,970; after 37 days, 22; and none after 51 days. Of the Staphylococcus pyogenes aureus, there were a countless number before freezing; after 18 days of freezing, 224,598; after 54 days, 34,320; and after 66 days, 49,280: of the typhoid-fever bacillus, innumerable before freezing, 1,019,403 after being frozen 11 days, 336,457 after 27 days, 89,796 after 42 days, and 7,348 after 103 days. These experiments were repeated with practically the same results, so that it may be accepted as abundantly proven, that, after prolonged freezing, a considerable number of the typhoid bacilla remain alive.

WILLIAM BABCOCK HAZEN.

THE sudden death of Brig.-Gen. William B. Hazen, chief signal officer of the U. S. army, which occurred on Sunday, Jan. 16, 1887, deprived the country of one of its most distinguished officers, and the signal corps of a chief who took a broad view of its duties and relations to the world of business and science.

Gen. William B. Hazen was the great-grandson of Thomas Hazen, who was born in 1719, and who was himself a great-grandson of Edward Hazen, who emigrated from England before 1649, and settled at Rowley, Mass., where he died in 1683.

The descendants of Edward Hazen include many names eminent in business, theology, and war. Energy, industry, and strong convictions characterize the members of the family on all sides.

General Hazen was born at West Hartford, Vt., Sept. 27, 1830. While he was yet a child, his parents removed to Hiram, Portage county, O. In 1851 he was appointed from Ohio as a cadet to the U. S. military academy at West Point, from which he graduated July 1, 1855. He was assigned to the 8th U. S. infantry, and spent the next five