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EIGHTEENTH ANNUAL SESSION

OF THE

16788

Medical Society of Virginia,

HELD AT

RICHMOND, VA.

OCTOBER 18, 19, 20 and 22, 1887.

Resolved, That there shall be affixed to the title-page of each edition of Transactions, a declaration that the Medical Society of Virginia, in publishing papers, does not thereby endorse the views of authors, such endorsement shall only be by vote to be found in the Minutes of the session.—Page 15, Article, 13th Section.

RICHMOND:

J. W. FERGUSON & SON, PRINTERS.

1887.

[VOLUNTEER PAPER.]

COCA:

Its Preparations and their Therapeutical Qualities, with some Remarks on the So-called "Cocaine Habit."

By WILLIAM A. HAMMOND, M. D., SURGEON GENERAL U. S. ARMY (Retired List), ETC., of New York, N. Y.

[Dr. William A. Hammond, in attendance upon the Session by invitation, under call for a paper or remarks, read a paper having the above title, which he had prepared as a contribution for the November, 1887, number of the *Virginia Medical Monthly*. As the paper is published in full in that journal, the Publishing Committee present simply a full synopsis of it, followed by the Secretary's report of the remarks made by Fellows, etc., in the discussion of the subject.—*Note by Recording Secretary.*]

DR. HAMMOND confined his remarks almost entirely to an account of his personal experience with the preparations of erythroxyton coca. The three preparations he has employed are the fluid extract, the wine, and the hydrochlorate of cocaine.

(1) *The fluid extract* in one or two fluid drachm doses, three times daily, sometimes acts well; but is so disagreeable to the taste as to be apt to excite nausea. Besides, being the extract of the leaves, as a whole, it contains substances that materially interfere with the action of the active principle of the drug. These are chiefly tannin and a resinous substance, to which the nauseous taste is mainly due. The fluid extract is rarely admissible

with children, as the irritant ingredients named often cause vomiting shortly after taking it. It seems to act better in persons of advanced age, as the tonic and astringent qualities of these very ingredients are often beneficial for them. But these matters are antagonistic to the action of cocaine, and present insuperable objections to the employment of the fluid extract when we desire to obtain solely the action of the alkaloid.

(2) *The wines of coca*, as usually prepared, present like objections. Experience has taught the Indians of Peru and Bolivia how to get the best results from the employment of the leaves of coca. They make the leaves into a mass with lime, and then chew them. The action of the saliva on this mass measurably separates the alkaloid, which is absorbed into the system, while the woody fibre, tannin and extractive matters are ejected from the mouth. But all the wines of coca are preferable, so far as taste and effect are concerned, to the fluid extract. But as now found in the market, they are generally uncertain, and often absolutely inert, except in so far as regards the wine entering into their composition. They vary greatly in the amount of cocaine they contain, and some of them are almost entirely free from this essential constituent. Dr. Hammond, therefore, got Messrs. Thurber, Whyland & Co., of New York city, who have an exceedingly competent chemist in their employ, to prepare a wine of coca with full bodied and absolutely pure wine, that should contain a fixed proportion of cocaine, and at the same time be free from tannin, resin, and other inert or resinous substances, present in the leaves. The result was a wine of coca containing two grains of cocaine to the pint, absolutely free from tannin and resinous matter, and pleasant to the taste, and giving about a sixth of a grain of cocaine to each ordinary wine glassful.

This wine of coca is beneficial in *spinal irritation*, especially in that very common yet distressing stomach irritability, marked by vomiting, with or without nausea, the moment any kind of food enters the stomach. In such instances, give the wine in teaspoonful doses every five minutes until eight or ten doses are taken. The first dose may be rejected almost as soon as swallowed, but the second will be retained longer, and the third longer still, and the fourth will probably not be thrown up at all. After tolerance is thus established, the wine may be given in larger

quantities—say a wineglassful just before eating—with the effect, in most cases, of producing entire relief of gastric irritation. It may then be continued, so long as may be necessary, as an agent of great value in curing spinal irritation, and as a tonic to the system. Indeed, this wine is beneficial in all instances in which it is desirable to increase the vital powers. Coca appears to be the one agent that can be thus employed without fear of the depression that so generally follows the use of other stimulants.

As a tonic to the vocal apparatus, it is of great value where fatigue follows the excessive use of the voice, or where the voice breaks down in the midst of some supreme effort. Where such fatigue or failure is feared, a full claret-glass of the wine, taken just before beginning to speak or sing, will almost invariably accomplish the object.

Cerebral hyperæmia is generally the result of excessive mental exertion, or of intense emotional disturbance. Nothing can be more beneficial in this condition than is this remedy. Dispensing with all other stimulants, Dr. Hammond advises a claret-glassful of the wine of coca with each meal. The influence is felt almost immediately, the vital powers seem to be at once restored, and the mind soon regains its former vigor. If sleep has been disturbed or absent, it becomes regular and in sufficient quantity, after the remedy has been taken for a few days. Such are the cases, passing under the names of nervous prostration and neurasthenia, general debility, etc., in which the influence of the wine of coca is most distinctly shown.

In another form of mental depression, often accompanying hysteria in the female, or a like condition in the male, attended usually with some disorder of the generative system, this wine of coca is invaluable—often curing it without any other medicine. Under its continuous use for several months, the emotions become more and more expansive, the disposition to brood over imaginary or slight troubles disappears, tears are no longer shed over mere nothings, and the countenance becomes hopeful. He has never had any trouble in causing the patient to stop the use of the wine of coca.

But he could not in a single paper mention all of the many morbid conditions of the nervous system in which he has found the wine of coca beneficial. In general, his own experience,

coupled with that of other practitioners, establishes the fact that the wine of coca is very valuable as a tonic and stimulant to the weakened or exhausted nervous system. Physicians of eminence likewise speak of it in the highest terms in many such diseases as fevers, dysentery, heart and lung troubles, and especially in malarious disorders. It is very remarkable that its use is not followed by the depression of mind and body that so generally ensue upon the use of other excitants.

(3) *Cocaine Muriate or Hydrochlorate*.—What is true of the wine is more emphatically true of the active principle, cocaine hydrochlorate, and should often be preferred even for internal administration. While best known as a local anæsthetic in operations about the eye, nasal cavities, etc., it is a speedy and decided remedy in certain affections of the nervous system.

About two years ago, Dr. Hammond undertook a series of experiments with this agent on himself, with the object of obtaining more satisfactory information relative to its action than it seemed possible for him to get otherwise. To quote the record of these observations:

I began by injecting a grain of the substance under the skin of the forearm, the operation being performed at 8 o'clock P. M. The first effect ensued in about five minutes, and consisted of a pleasant thrill which seemed to pass through the whole body. This lasted about ten minutes, and shortly after its appearance was accompanied by a sensation of fulness in the head and heat of the face. There was also noticed a decided acceleration of the pulse, with increase of force. This latter symptom was probably, judging from subsequent experiments, the very first to ensue, but my attention being otherwise engaged it was overlooked. On feeling the pulse five minutes after making the injection, it was found to be 94, while immediately before the operation it was only 82. With these physical phenomena there was a sense of exhilaration and an increase of mental activity that were well marked, and not unlike in character those that ordinarily follow a glass or two of champagne. I was writing at the time, and I found that my thoughts flowed with increased freedom and were unusually well expressed. The influence was felt for two hours, when it gradually began to fade. At 12 o'clock (four hours after the injection) I went to bed, feeling, however, no disposition to sleep. I lay awake till daylight, my mind actively going over all the events of the previous day. When I last fell asleep it was only for two or three hours, and then I awoke with a severe frontal headache. This passed off after breakfast.

On the second night following, at 7 o'clock, I injected *two grains* of the hydrochlorate of cocaine into the skin of the forearm. At that time the pulse was 84, full and soft. In four minutes and a half it had increased to 92, was decidedly stronger than before, and somewhat irregular in rhythm. The peculiar thrill previously mentioned was again experienced. All the phenomena attendant on the first experiment were present in this, and to an increased degree. In addition there were twitching of the muscles of the face, and a slight tremor of the hands noticed especially in writing. In regard to the mental manifestations there was a similar exhilaration as in the last experiment, but much more intense in character. I felt a great desire to write, and did so with a freedom and apparent clearness that astonished me. I was quite sure, however, at the time, that on the following morning, when I came to read it over, I would find my lucubrations to be of no value. I was therefore agreeably disappointed when I came to peruse it, after the effects of the drug had passed off, that it was entirely coherent, logical, and as good if not better in general character as anything I had previously written. The effects of this dose did not disappear till the middle of the next day, nor until I had drunk two or three cups of strong coffee. I slept little or none at all, the night being passed in tossing from side to side of the bed, and in thinking of the most preposterous subjects. I was, however, at no time unconscious, but it seemed as though my mind was to some extent perverted from its usual course of action. The heat of the head was greatest at about 12 o'clock, and at that time my pulse was 112—the highest point reached. I had no headache until after arising, and the pain disappeared in the course of the morning.

Four nights subsequently I injected *four grains* of the hydrochlorate of cocaine into the skin of the left forearm. The effects were similar in almost every respect with those of the other experiments except that they were much more intense. The mental activity was exceedingly great, and in writing, my thoughts as before appeared to be lucidly and logically expressed. I wrote page after page, throwing the sheets on the floor without stopping to gather them together. When, however, I came to look them over on the following morning, I found that I had written a series of high flown sentences altogether different from my usual style, and bearing upon matters in which I was not in the least interested. The result was very striking as showing the difference between a large and excessive dose of the drug; and yet it appeared to me at the time that what I was writing consisted of ideas of very superior character, and expressed with a beauty of diction of which I was in my normal condition altogether incapable.

The disturbance of the action of the heart was also exceed-

ingly well marked, and may be described best by the word "tumultuous." At times, beginning within three minutes after the injection, and continuing with more or less intensity all through the night, the heart beat so rapidly that its pulsations could not be counted, and then its action would suddenly fall to a rate not exceeding 60 in a minute, every now and then dropping a beat. This irregularity was accompanied by a disturbance of respiration of a similar character, and by a sense of oppression in the chest that added greatly to my discomfort.

On subsequent nights I took *six, eight, ten and twelve grains* of the cocaine at a dose. * * * * The effects * * * * were similar in general characteristics though of gradually increasing intensity in accordance with the dose taken to that in which four grains were injected. * * * * In one, that in which *twelve grains* were taken, I was conscious of a tendency to talk, and as far as my recollection extends, I believe I did make a long speech on some subject of which I had no remembrance the next day. In all, the action of the heart was increased, was irregular in rhythm and force to such an extent that I was apprehensive of serious results. Insomnia was a marked characteristic, and there was invariably a headache the following morning. In all cases, however, the effects passed off about midday, and by evening I was as well as ever.

My experience had satisfied me that a much larger dose than any I had up to that time injected might, in my case at least, be taken with impunity. A consideration of the phenomena observed appeared to show that the effects produced by twelve grains were not very much more pronounced than those following six grains. I determined, therefore, to make one more experiment, and to inject *eighteen grains*. I knew that in a case of attempted suicide twenty-three grains had been taken into the stomach without seemingly injurious effect, and that in another case thirty-two grains were taken within the space of three hours without symptoms following of greater intensity than those I had experienced.

I had taken the doses of eight, ten and twelve grains in divided quantities, and this dose of eighteen grains I took in four portions within five minutes of each other. At once an effect was produced upon the heart, and before I had taken the last injection the pulsations were 140 to the minute and characteristically irregular. In all the former experiments, although there was great mental exaltation, amounting at times almost to delirium, it was nevertheless distinctly under my control, and I am sure that at any time under the influence of a sufficiently powerful incentive I could have obtained entire mastery over myself, and have acted after my normal manner. But in this instance, within five minutes after taking the last injection, I felt that my mind was passing beyond my control, and that I was becoming an irresponsible

agent. I did not feel exactly in a reckless mood, but I was in such a frame of mind as to be utterly regardless of any calamity or danger that might be impending over me. I do not think I was in a particularly combative condition, but I was elated and possessed of a feeling as though exempt from the operation of deleterious influences. I do not know how long this state of mind continued, for I lost consciousness of all my acts within, I think, half an hour after finishing the administration of the dose. Probably, however, other moods supervened, for the next day when I came downstairs, three hours after my usual time, I found the floor of my library strewn with encyclopædias, dictionaries, and other books of reference, and one or two chairs overturned. I certainly was possessed of the power of mental and physical action in accordance with the ideas by which I was governed, for I had turned out the gas in the room and gone upstairs to my bed-chamber and lighted the gas, and put the match used in a safe place, and undressed, laying my clothes in their usual place, had cleaned my teeth and gone to bed. Doubtless these acts were all automatic, for I had done them all in pretty much the same way for a number of years. During the night the condition which existed was, judging from the previous experiments, certainly not sleep; and yet I remained entirely unconscious until 9 o'clock the following morning, when I found myself in bed with a splitting headache and a good deal of cardiac and respiratory disturbance. For several days afterward I felt the effects of this extreme dose in a certain degree of languor and indisposition to mental or physical exertion; there was also a difficulty in concentrating the attention, but I slept soundly every night without any notable disturbance from dreams."

"Certainly in this instance I came very near taking a fatal dose, and I would not advise anybody to repeat the experiment. I suppose that if I had taken the whole quantity in one single injection instead of in four, over a period of twenty minutes, the result might have been disastrous. Eighteen grains of cocaine are equivalent to about 3600 grains of coca leaves, and of course, owing to its concentration, capable of acting with very much greater intensity.

I am not aware that a fatal dose of cocaine has yet been indicated by actual fact. Probably eighteen grains would kill some people, and perhaps even smaller quantities might, with certain individuals, be fatal. But these are inferences and not facts; but so far as I know there is not an instance on record of a person dying from the administration of cocaine.

So far as my experiments extend (and I think it will be ad-

mitted that they have gone as far as is safe) I am inclined to think that a dose sufficient to produce death would do so *by its action on the heart*. Certainly it was there that in my case the most dangerous symptoms were perceived. The rapidity, force, and marked irregularity of the pulse all showed that the innervation of the heart was seriously affected.

It is surprising that no marked influence appeared to be exercised upon the spinal cord or upon the ganglia at the base of the brain. Thus there were no disturbances of sensibility (no anæsthesia) and no interference with motility, except that some of the muscles, especially those of the face, were subjected to slight twitchings. In regard to sight and hearing, I noticed that both were affected, but that while the sharpness of vision was decidedly lessened, the hearing was increased in acuteness. At no time were there any hallucinations."

Acting upon these data, Dr. Hammond has always used hydrochlorate of cocaine, when employing it in its pure state, by hypodermic injections. For internal administration, he prefers the wine of coca. But as the substance applied to mucous membranes diminishes the calibre of the blood vessels and produces anæsthesia of the part, he would give cocaine muriate by the mouth in certain stomach affections on the same principle as it is at present applied to mucous membranes of the nose, pharynx, larynx, etc.

In cases of *melancholia* and in *hysteria with great depression of spirits*, he has derived benefit from its hypodermic use, beginning with half grain and gradually increasing to two grains if required. One injection daily for three or four days will often make the most dismal melancholic cheerful, and act permanently.

He has used it entirely satisfactorily in two cases of *neuritis of radial nerve*, attended with great pain, partial paralysis of the muscles supplied by the nerve, and numbness of the thumb, index and outer half of the middle finger. He injected half grain every two hours—eight times in one case, and ten times in the other—at the point, and deep enough to come as near as possible to the nerve, where the pain was greatest. The symptoms began to subside from the first injection, and there was no return after the last.

He has not had an opportunity to use it in *sciatica*; but in such a case he would inject at the upper part of the sciatic nerve, and

try to throw the cocaine solution into the substance of the nerve itself.

In *neuralgia*, the cocaine should be injected very near the inflamed nerve, for it is only by its local action that it can have the desired effect.

Dr. Hammond purposely omitted reference to its established uses in ophthalmology, rhinology and laryngology so as to save time to speak about the *So-called Cocaine Habit*.

He is sure this has no existence *as such*. Morphine eaters, having heard that it is an antidote to their habit, undoubtedly have tried to cure themselves with it; but without stopping the morphine have simply engrafted the cocaine habit on the morphine habit—an exceedingly bad combination. But he emphatically denies that there is such a thing as a cocaine habit, pure and simple, which the individual cannot, of his own effort, altogether arrest. The pleasurable mental exhilaration induced by injections of half a grain or grain produces no weakening of the will power, nor craving for the drug, such as is produced by morphine, etc. He has repeatedly given it for weeks, and has never had a single one, male or female, object to its being stopped—not even as much as to giving up tea or coffee, and nothing like as much as stopping alcohol or tobacco. Dr. Bosworth, of New York, took within the space of a few months, he thinks between 500 and 600 grains, and stopped its use, without suffering the least inconvenience. Dr. Frank W. Ring (*Medical Record*, September 3d, 1887) applied with an atomizer nightly for ten months two grains of a four per cent solution to the nasal mucous membrane—taking more than 600 grains during the ten months; and then he calmly decided to stop it, which he did. The inclination for it often seized him, but he crushed it with the perfect confidence that he shall never again indulge in its enchantments.

As a matter of personal experience, Dr. Hammond related that last March he was attacked by a *violent rhinitis* of a form not laid down in the books, and different in character, and of far greater intensity than any that any rhinologist he consulted had ever witnessed. There was great swelling of the nose and face; the discharge during the first stage was of an exceedingly acrid and thin fluid, followed by the formation of a very loosely attached membraniform substance not very unlike that of diphtheria, but

with no disposition to extend beyond the nasal cavities. From March 1st to July 16th, he applied by atomizers, camel's hair pencils, etc., an average of twenty grains a day of different percentage solutions, with great relief. He was always careful to make the applications far enough back until he tasted the cocaine. He used, therefore, about 600 grains a month, but nothing like this, of course, entered the system. Besides its local influence, its effects upon the system were a slight mental exhilaration, and sometimes an indisposition to sleep when he took more than his usual quantity. On July 16th, he stopped the use of the remedy without the slightest difficulty, nor did he resume it again for six weeks, when his disease returned. From August 26th to October 1st, he used nearly 800 grains, and then again ceased using it without the slightest difficulty. On neither occasion of stopping its use was there the slightest craving for it, or inconvenience.

Dr. W. L. ROBINSON, of Danville, Va., had seen prompt and permanent relief from sciatica by hypodermic injections of cocaine, deep down on the nerve, but had utterly failed with the same agent in facial neuralgia (*tic douleureux*). He did not believe it would do any good on a granular surface, and in his own case of hay fever, he had failed to receive any relief even with a 20 per cent. solution, until the granular surface was cauterized. He could not think any remedy of such power could be used *ad libitum* without danger.

Dr. B. L. WINSTON, of Hanover C. H., stated that he had used cocaine in the case of a virgin 18 years old, who was suffering with vaginismus, hoping that with the aid of the drug, he would be able to forcibly distend the ostium vaginae. So far as he could detect, however, it had no effect whatever on either the hyperæsthesia or the spasmodic contraction of the sphincter vaginae muscle. It was only after his patient was completely anesthetized with chloroform that he was able to distend the ostium vaginae effectually. He did not use the cocaine stronger than a four-per-cent solution, which, perhaps, accounted for his failure.

Dr. LANDON B. EDWARDS, of Richmond, thought Dr. Winston's case scarcely a fair test of the value of the agent, because of the small dose. In a case under his care, where the pain of inter-

course with her husband was so painful as to make her dread the act, he directed that a sixteen-per-cent solution be applied with a small piece of absorbent cotton to the mouth of the vagina, or an ointment of like strength made with cosmoline, some fifteen minutes or so before she anticipated the intercourse. She afterwards said that the cocaine had relieved her to such a degree as to make the marital relationship enjoyable. He was rather surprised at the statement by Dr. Hammond that he did not believe that there was a cocaine habit, in the usual sense of the term, established by the too frequent and immoderate use of cocaine. He had heard of a case in this city.

DR. HUGH M. TAYLOR of Richmond, Va., was surprised to hear Dr. Hammond express his disbelief in the existence of the cocaine habit, as he (Dr. Taylor) had seen a case ending in delirium or mania, which had lasted for several weeks, and which had deeply impressed him with the danger of habit, incident to the continuous use of cocaine. The unfortunate victim of the habit was a young physician, who had had the drug prescribed for him for the relief of some supposed kidney disease. He had been using cocaine hypodermically for eighteen months or two years, and gradually the size of the dose and its frequency had to be increased as his system became habituated to its effects, or as his depraved nervous system demanded a larger supply. From a small to a large dose, from longer to shorter intervals, and from a minor to a marked effect, the growth of the habit was easily traced until the victim's will-power was all gone, and he had not the will to will its discontinuance. Without known reason, he had left his practice in the country and had come to Richmond, where he had been for several weeks. His conduct was so strange that his friends were telegraphed to come and look after him. He had mixed himself up in all sorts of business transactions, and talked and behaved in such a suspicious way that his friends recognized the necessity of placing him under some restraint. When seen by Dr. Taylor, he had been quarantined in his room in the hotel for twenty-four hours. His hypodermic syringe with which he gave himself the cocaine, had been taken away from him and no form of substitute was allowed. He was about as rational as a man who had been taking whiskey or opium freely, and about as nervous as one from whom these

agents had been suddenly taken. Almost his first utterance was an appeal for the return of his syringe and permission to continue the use of cocaine. He did not want whiskey nor opium—no substitute would do. He could not live without cocaine, and wanted it that moment. He plead for it on the ground of its being necessary for his health, insisted that he could not live without it, and did not hesitate to threaten his own and other lives if his request was not granted. His legs and arms were thick with needle punctures, and the blood specks on his underclothes showed the frequency of the dose.

With Dr. Taylor's consent he was placed in an institution for treatment, but in a few days he made his escape and returned to his country home. His brothers there took charge of him, shut him up in his room, put a guard over him, and kept him in confinement for a month or six weeks. At the end of that time his nervous system had recovered its tone, and he had lost his cravings for the drug, and was supposed to be well.

The history of this case, together with his own observations, left no doubt on Dr. Taylor's mind that cocaine should be classed with opium, chloral and chloroform, as one of the dangerous remedies to trust unreservedly in the hands of the uninitiated. While he appreciated the boon cocaine conferred upon suffering humanity, he felt called upon to insist upon the danger of continuing its use for a great length of time. He was unalterably of the opinion that the case he reported was one of cocaine habit, and as far as he knew, no other agents, such as opium, chloral, whiskey, chloroform, etc., were factors in the case.

DR. L. ASHTON, of Falmouth, Va., said that he had successfully treated one case of opium habit by the substitution of cocaine and then dropping the cocaine. In such a case as Dr. Edwards had reported, he would suggest its use as an ointment made with lanolin.

DR. JOHN N. UPSHUR, of Richmond, Va., said, he thought that cocaine was a remedy that should be used with caution, not being at all times uniform in its action. He related the case of a lady recently under his care, who was suffering from uterine disease, subsequent to a miscarriage. There was intense hyperæsthesia of the cervix and vagina. He used three-grain suppositories of

cocaine twice daily for its relief, and with no unpleasant symptoms. She suffered however, some week or two later with intense pain of inflamed hæmorrhoids, for which he used a suppository of cocaine grs. ij. opium and ext. belladonna āā gr. ¼. In an hour after the introduction of the first suppository, she was seized with the most intense hysterical excitement, face flushed, and developed symptoms of intoxication, which lasted for six or eight hours. He was satisfied that this condition was caused by the cocaine, and that neither the opium nor belladonna had anything to do with it, as she had repeatedly taken these agents, both by the mouth and hypodermically, without any unpleasant effects, nor were the symptoms in any way analogous to the physiological effects of opium or belladonna.

Dr. R. M. SLAUGHTER, of Theological Seminary, Va., had used cocaine in a case of vaginismus without success; but he had not used the application in anything like the strength that has been referred to to-day.

Dr. E. W. ROWE, of Orange C. H., thought it too hasty for Dr. Hammond to draw the conclusion that there was no such thing as the cocaine habit, simply because he had not seen a case.

Dr. ROHÉ, of Baltimore, Md., said he was familiar with the use of cocaine in rectal diseases. He uses suppositories of three grains of cocaine with half-grain of extract of belladonna. It is certainly useful as an anæsthetic in operating on hæmorrhoids.

Dr. THOMAS J. MOORE, of Richmond, Va., cited two cases—one of operating for fissure as a result of piles, and the other to relieve pain while removing some stitches. In neither case did the cocaine application do any good.

Dr. ALEX. HARRIS, of Jeffersonton, Va., has used it with great satisfaction in cases of conjunctivitis. It acts both as an astringent and anæsthetic.

Dr. SAMUEL B. MORRISON, of Rockbridge Baths, Va., has used it to irrigate the bowels, but had derived no effect. He agrees with Dr. Moore.

Dr. HUGH M. TAYLOR has used it preparatory for operation for

vesico-vagina fistula, and also for lacerated perineum, etc., and was pleased with the effect.

Dr. J. F. WINN, of Richmond, Va., had used cocaine as a satisfactory anæsthetic in removing piles.

Dr. HAMMOND said that the drug is something new, and we have not yet learned all of its uses nor its abuses. Even the early history of Peruvian bark showed that its uses were not properly understood; even deaths were then attributed to it, which we now know were not due to cinchona. He does not wish to be understood as saying that there is no such thing as the cocaine habit, but he does say that the habit is very much like that of the coffee habit. All of us feel that we have power left us of discontinuing its use if we choose to will to discontinue its use. This is not the feeling of a whiskey-drinker or an opium-eater. When such an one wishes to discontinue the whiskey or the opium, he finds himself almost powerless to put forth the necessary will force. In the case reported by Dr. Taylor, it should be taken into consideration that his doctor had advised him to take the cocaine, that the cocaine gave relief, and it may have been a determination to have the cocaine rather than to suffer the pain he was having. It was a case of preference, and not a case of irresistible habit. Cocaine is undoubtedly an antidote or a good substitute for morphine habit; for the former can be broken, while the latter cannot be easily broken except by medical treatment. It seems to be established that cocaine does not act satisfactorily when *applied* to inflamed tissues, but it does act when injected near the inflamed part so as to be absorbed. But there are exceptions even to the statement that it does not act when applied to inflamed surfaces; for it does act well when applied to inflamed surfaces of the eye and nose. Gen. Grant's case is too fresh in memory to have to repeat it here in illustration of its value when applied to inflamed tissues. In any of such surgical cases as have been referred to to-day, good would probably have resulted had a twenty-per-cent solution been used instead of a weaker preparation. He had recently given great relief to a lady while travelling on the cars, and who had gotten a cinder in her eye, which was causing inflammation, by pencilling the eye with the preparation he usually carried about with him. In three minutes her eye was painless, and no inflammation resulted. In the rare cases of

injurious or threatening effects, to which allusions have been made, he would remind the gentlemen that other things act as peculiarly. For instance, Dr. J. B. St. John Roosa, the distinguished ophthalmologist of New York, had had a case in which an unusually small quantity of atropia solution applied to the eye produced severe symptoms of belladonna poisoning. He had not tried in his paper to state anything like the full list of diseases for which cocaine is useful. Hence he had not dwelt upon the value of the drug in mucous inflammations. In vaginismus, he had used something like a twenty-per-cent solution with invariable success. Among the odd uses to which he had satisfactorily put cocaine was one of masturbation in the female—the habit being established in her by rubbing or scratching an itching vulva. He simply kept the parts wet with a solution of cocaine, and she was relieved of both the pudendal irritation and the masturbatory habit. In the same way, keeping the prepuce wet with cocaine solution, will often cure masturbation in the male. As to rectal diseases, he has no experience with cocaine. He said that Dr. Milton Josiah Roberts was in the habit of using a twenty-four-per-cent solution, and thinks very highly of it. He is surprised at Dr. Wm. L. Robinson's statement that he had derived so little benefit from cocaine in his case of hay asthma. So far as he knows, it is about the only case on record in which it did not do great good in that disease. So generally valuable is it in that disease that the Hay Fever Association has adopted it as their remedy.

Dr. CHARLES M. SHIELDS, of Richmond, Va., said that he uses a strong solution of cocaine in cauterizing and in like operations upon the mucous membrane of the nose, and yet has had no disagreeable effect from his daily use of it. He combines it almost invariably with atropia, and this combination acts well.

[VOLUNTEER PAPER.]

REPORT OF A CASE OF

Abdominal Surgery for Intestinal Obstruction.

By JOHN R. SOWERS, M. D., of Warrenton, Va.

At the request of the attending physician, Dr. Shirley Carter, I was called to see Mr. Wm. T., a man about 68 years of age, who was suffering from obstinate and protracted constipation, and which had resisted all medicinal means of relief. I found him suffering intensely from violent peristaltic movements of the bowels, which could be distinctly felt and seen through the thin abdominal walls, accompanied by gurgling noises, and by exacerbation of pain. When these movements subsided, though there was a general discomfort and soreness through the bowels, he was unable to localize the pain so as to point to the seat of obstruction. The bowels were not very greatly distended. There was no fever, and temperature somewhat below normal. The countenance expressed physical anxiety and distress. The eye was sunken, and surrounded by a livid circle. The skin was somewhat dry and sallow. The pulse was small, but quick; and there was frequent hiccough.

From the history of this case, I find that the patient has not passed more than a tablespoonful of fecal matter from his bowels during the last three weeks, but has had frequent vomiting of the same until within a few days ago. The constipation became very marked two months previous, and gradually increased in obstinacy in spite of all efforts to relieve that condition. The patient's