is clear that the small magnet is suited only to such cases as admit of its point being brought in direct contact with the splinter, while the remaining cases are clearly within the domain of the giant magnet. Under this view of the case most, if not all, splinters in the vitreous should be extracted with the giant magnet, and not a few in the aqueous chamber.

Experiment and observation show that the farther the magnet is from the splinter the more uniform the action of its force, and the nearer the more jerky such force—the stronger the magnet the more marked this law. It follows that in practice it is wise to either (1) bring the eye close to the magnet point ere starting the current and increase its power very slowly, or (2) bring the eye from a considerable distance toward the point of the magnet with full current very gradually. The jerky force is liable to draw the splinter into the ciliary body, whence it is removed with difficulty, if at all, or it may draw it into some other undesirable location. To rectify this state of the splinter Dr. Kipp has shown us how to utilize the other tip of the magnet to repel the splinter from its misadventure; of course, this calls for a double-ended magnet. In his case the splinter fixed itself firmly in the ciliary body, and no change in direction of the magnetic force would dislodge it. He reversed the pole, when the splinter was released and readily removed. Possibly had this fact been known many failures would have been avoided, as even Haab reports failure from this cause.

When the splinter is caught in the iris one method of its release is given in the first case. Another is the use of the repelling power of the opposite pole. Still another is given by Haab thus: make an opening in the cornea directly over the site of the splinter, then enter with an iris forceps and grasp the iris just beyond the inner edge of the splinter, and gently push it inward till a rent is made in the iris over the splinter. The magnet is now applied at the artificial opening and the fragment extracted. The tear soon heals and the iris regains its normal motility—a far preferable plan to an iridectomy.

Haab so places his magnet that the force shall pass directly through the center of the cornea, expecting the splinter to approach the posterior pole of the lens, curve around its posterior surface, penetrate the suspensory ligament, enter the aqueous chamber, pass between the posterior surface of the iris and anterior surface of lens to the pupillary opening, whence it is extracted by a conveniently located corneal incision. In cases like those reported, where the wound in the cornea is large and freshly made, a new corneal incision is superfluous and the placing of the magnetic current over the fresh wound more desirable. Doubtless other cases will make it desirable to depart from Haab's rule.

A comparison of Haab's results with the small magnet and those with the giant are suggestive. The former are given by Adolph Huzler, in Morris and Oliver's System of Ophthalmology. Of 18 cases operated on before 1892 by the small magnet, the foreign body was in the vitreous chamber; the splinter was not found in 5 cases; was extracted in 13; vision of $1/7$ was secured in one case; the counting of fingers in 8; most had detachment of the retina; and in 7 the eyes had to be sacrificed. In commenting on this Knapp says that his experience was not quite so bad, as he had obtained perfect sight in a few cases where the foreign body could be seen and extracted soon after entrance.

Since 1892 to June, 1902, Haab reports 165 operations with the giant magnet. Of these 23 failed; 39 eyes were enucleated; 9 had lingering cyclitis; 19 were saved from inflammation, but were sightless. Of 71 cataracts extracted 51 had good vision.

His failure to extract the foreign body he lays to four causes: 1, A firm fixation of the splinter in the posterior wall of the eyeball (emphasis to be placed on the "firm," as in other cases the splinter was extracted from the same location); 2, firm fixation of the splinter in the ciliary body; 3, splinter held by a fibrinous exudate; 4, a splinter healed over in the lapse of months. These are some of the limitations of the giant magnet.

As elsewhere, infection by the penetration of a splinter is fatal to the eye and always a source of anxiety after the removal of the foreign body. Haab, to guard against this, introduces into the eyeball a specially prepared plug of iodoform, as both protective and curative. Most operators content themselves with placing the eye at rest with atropin and the general health in such condition as to best resist infection and promote repair of the damage done thereby.

Since the introduction of the giant magnet the x-ray and sideroscope have increased our power of localization, so making it possible to accomplish far more with the small magnet. They have also advantaged the use of the giant magnet; but it is clear that the latter enables us to do many successful extractions of foreign bodies from the vitreous chamber hitherto impossible.

103 Cass Street.

SOME NEW AND UNUSUAL THERAPEUTIC APPLICATIONS OF ERGOT.*

ALFRED T. LIVINGSTON, M.D.

JAMESTOWN, N. Y.

In Wood's Reference Handbook it is stated that ergot "appears to have been used by the peasantry in some parts of Europe in childbirth as much as three hundred years ago—but its formal introduction into modern medicine is due to the efforts of Dr. Stearns of New York in the early part of the present (nineteenth) century." I quote again from the same source: "The greatest value of ergot in therapeutics depends on its action on the uterus," and "Ergot is also to be recommended in all forms of capillary hemorrhages." This is essentially the ergot-therapy of the books, as well as of general practice to-day, but you will invariably find long dissertations on its poisonous effects, ergotism.

THE AUTHOR'S EARLY EXPERIENCE.

It is almost thirty years since, as assistant physician in the State Lunatic Asylum of Utica, N. Y., I began to use ergot to modify the hyperemia of the brain in insanity, especially in the melancholic class. We there used the drug almost wholly in the form of the fluid extract administered by the mouth, but I remember that I experimented, during my service there, with various preparations which I made to use hypodermically. I can not now recall the other uses to which I put the drug while at Utica; but there must have been others, for I distinctly recollect that one of the first preparations which I made for the practice of my profession in Philadelphia, to which city I removed in the autumn of 1878, was the making of a solution of the Bonjean ergotin for hypodermic use to carry in my pocket.

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THE USE OF ERGOT IN CONGESTION OF THE HEAD.

It was thus that I was prepared to meet the demands of a very striking case, which I will relate, because it is from that hour I date my appreciation, which but gradually developed through many years, of the broad therapeutic application of ergot.

I had been in Philadelphia but a few weeks when an emergency call took me to a house on Sansom street, above Tenth, now, I believe, a part of the Jefferson College property. I found a very plethoric old man sitting in a large arm chair, retching violently. I had never before, nor have I since, seen such retching. It appeared that, after a usual supper, he had gone out on the street, but soon returned and began to vomit and from that time until I was called, at 11 o'clock, he had been continuously vomiting or retching. He was so completely exhausted that he did not lean forward or even hold up his head, which lay against the back of the chair. I did not attempt to question him, for he was too much occupied to reply, and, as his housekeeper could give me no further light on the case, I was obliged to draw my conclusions from what I saw; as I learned to do in dealing with the insane. The frontal vein was not a whit less in size than my little finger, and the general engorgement of head and neck I have never seen equaled. His pulse was rapid, full, bounding and hard. Between retchings he murmured but one word, "pain"! From the moment I first saw him I feared there would be a rupture of a blood vessel of the brain before I could relieve the terrible straining. I concluded that whatever the fundamental cause of this tremendous disturbance of the circulation, the present retching and pain were due to vascular engorgement within the head and that the immediate indication was to contract the dilated blood vessels. With this conclusion came the recollection of my ergot, which I began at once to administer hypodermically. I gave it slowly, as I had learned that it was not desirable to inject a syringeful of ergot as suddenly as a hypodermic of morphia is frequently given. As I progressed with the injection, I observed a gradual change in his symptoms, a lessening both of the vascular tension and of the retching. In acute disturbances of the circulation the rapidity of action of ergot is simply astounding. By the time I had emptied the syringe the suffusion had disappeared, the retching had ceased, the pulse was soft and but little accelerated, the patient was quiet and appeared comfortable. The cyclone which had been raging for four hours had passed and there was calm.

The excitement in the household had drawn many people into his room, and I detailed several of the men to undress him and put him in bed. Although there was then no indication for it, as a precaution against being called to him in the night, I gave him another hypodermic of the ergot and left him. The next morning I learned that a few minutes after I left him he fell asleep and slept continuously for six hours.

Two weeks later I was hurriedly called to him in the early morning, and found him in as great mental excitement as his previous physical excitement had been. He had just discovered that his escritoire had been pried open and a wallet containing nearly a thousand dollars had been stolen. He was practically in acute melancholia, wringing his hands, weeping and exclaiming: "Oh, God! oh, God!" in most pitiful fashion. I again applied my ergot as before, and, although it was not magical enough to restore the money, it did, as promptly as before, restore his calm.

EXPLANATION OF ITS SPECIFIC ACTION ON VASCULAR DILATATION.

I had now, within a fortnight, two impressive object lessons on the therapy of ergot, which have remained vivid through these twenty-five years. The first demonstrated that ergot contracts dilated blood vessels; the second demonstrated that ergot subdues an intense nervous excitement and causes it to disappear, although the cause of the excitement remains. My reflections on the latter and my observations of the action of ergot

on many and varied disorders which are usually regarded and treated from the purely nervous standpoint, have led me to conclude that the primary disorder in the mass of nervous conditions is in the circulation in and about those nervous structures whose functional derangements are noted and that therefore the primary indication is not so much nerve foods, nerve tonics, nerve stimulants, nerve sedatives and rest, as it is an equable circulation, a circulation that is in tone in all its parts. The more I deal with nervous conditions the less use I have for phosphorus, nux or strychnia, iron, quinia, opium, the bromids or other depressant salts, and the more use I have for anything and everything that tends to equalize and tone the circulation; a proper activity of the bowels and glands generally, electricity in stimulating the vaso-motor centers and in storing the nervous batteries with the force which is like the nervous force, shock, massage, dry-cupping, exercise, and, above all, ergot, for its specific tonic effect on the circulation, especially on those vessels which are relaxed from lack of sufficient nervous impulse on them, or paralyzed from over-distension and incapable of contracting against this pressure from nervous impulse alone. While ergot contracts the unstriated muscular fiber it certainly acts on those fibers most which most need its aid; otherwise it would not tend to produce equilibrium of the circulation.

I have often observed, when applying galvanism over the cervical sympathetics, that the ears, face and neck, which before treatment were more or less suffused, gradually paled until no vestige of suffusion remained and sometimes pallor supervened. I have frequently produced the same disappearance of suffusion with ergot, but not pallor. The galvanism, stimulating the vaso-motor centers of the head, produced anemia of the vessels of that region if over-supplied; but the ergot produced only general equilibrium because it acts on all dilated vessels wherever they may be. The objection made to ergot, that it raises blood pressure, seems to me unfounded within the limit of rational dosage. If it raises blood pressure in the arteries it is diminished in the veins and capillaries, and when you have secured in any given case an ideal or approximate equilibrium of the circulation, what better result can you desire in that case? In one given case the general blood pressure may be much higher than in another given case, but in any given case, to demand something better than general equilibrium, a proper proportion in each part, seems as superfluous as to request the artist to improve the hue of the lily. Of course, normally, physiologically, there is disturbance of equilibrium of the circulation. Whatever organ or set of organs is now supreme in functional action is receiving more than its usual supply of blood and the rest have a diminished supply. Pathologic activity is quite another thing. If the circulation in the brain is not in good tone functional action is continuously excessive and not well performed. Thoughts are abundant, but not orderly. A confused mass of ideas comes before the perception and it is difficult or impossible to arrange them. If expressed, there is incoherence. Or, inflammation develops, exudation takes place and function ceases. If the circulation in the digestive tract is not in tone, secretion is abnormal in quantity or quality, or both, and the objects of its function are not obtained. If the circulation in a wounded part is not in tone repair is slow or does not occur, or inflammation supervenes with its serious or fatal consequences. All these conditions occur because

of lack of tone in the circulation. Ergot is the one powerful, effective therapeutic measure to secure both equilibrium and tone in the circulation, and this is surely "the great value of ergot in therapeutics" rather than "its action on the uterus." In this respect it has a thousand or ten thousand applications to one demand for it on the womb.

If you ask me how ergot produces its effect on the relaxed unstriated fibers, I must confess that I do not know. I have made no experiments on animals. Every new use which I have made of ergot in my practice was made on analogical reasoning on previous conditions and effects in other subjects. If, in a case of headache, I use galvanism over the cervical sympathetic ganglia, I relieve the headache by stimulating those nervous batteries to a greater activity, which creates more force, which is then distributed over their wires, the vaso-motor nerves, to the muscular tissue of the blood vessels, which then contract. If I give to the same patient with the same sort of headache a hypodermic of ergot, I also relieve the headache with more certainty and more promptly; but there are other effects of a more general character, all-over effects, that are not produced by the galvanism along the neck. Hands and feet become warm, glands are stimulated and their functions better performed; the pulse, if too full, becomes smaller and softer, if too small it becomes fuller; the heart action is slowed and irritability disappears, a general sense of comfort and well-being prevails, the whole system is normalized. I can hardly believe that all this is developed in the brief time solely by the action of ergot on the vaso-motor centers; and I do not hesitate to say that I believe that ergot acts directly from the circulation in which it is being carried. Even the improved activity of the nerve centers themselves may be due to the like correcting of their own blood vessels, for I am convinced that disturbed function in any organ is chiefly due to hyperemia, dilated blood vessels. However, the manner of action of ergot is not to be compared in importance with what it does, and of that I feel more competent to assert.

INSOMNIA.

Associated with many nervous affections, especially insanity and its ally neurasthenia, is insomnia, ordinarily one of the most difficult conditions to meet therapeutically. I believe it is generally accepted that in natural sleep there is a diminished blood supply to the brain, which theory is in harmony with my observations of the action of ergot in insomnia. Ergot is not only the most effective agent in insomnia, but the sleep which follows its administration is the most natural sleep that is produced by any drug. I think this is because it produces most nearly the condition of the circulation which belongs with natural sleep. There is sometimes such irritability of the nervous tissues, as from organic changes, that it is desirable to associate with it some one of the more purely hypnotic class to dull the abnormal sensibility, which reminds me of an incident that occurred many years ago.

HEADACHE.

I was telling the late Dr. Hodge of Philadelphia, a famous obstetrician of his day, my treatment of a case of insanity which he had commended to my care. I said that I was giving her chloral and ergot to help her to sleep. With manifest sarcasm he inquired, "Do you call ergot an hypnotic, Doctor?" "No!" I replied, "I don't call it an hypnotic, but I do call it a mighty efficient aid to an hypnotic." It is probable that the doctor had

never thought of ergot except as related to his specialty. Scores of times patients have fallen asleep in my office after having a hypodermic of ergot to relieve a headache. This also suggests the relation of sleep to a diminished blood supply to the head, for headaches are undoubtedly congestive in the large majority of instances. Indeed, I think an anemia headache very rare, and if I diagnosed such an one I might then give ergot, for there would likely be some part of the circulation hyperemic, the correcting of which would bring a fuller supply of blood to the head. Headache is probably the most common complaint of humanity, and in itself comprises an extensive field for the application of ergot, not only for immediate relief, but to give tone to the cerebral vessels that will prevent recurrences. Chronic and recurrent headaches can be cured by a course of ergot, though in such cases I prefer to use galvanism over the cervical sympathetics in conjunction with hypodermic injections of ergot.

EYE AND EAR DISORDERS.

A common associate symptom with chronic or recurrent headaches is a disordered function of sight, which often leads to the use of glasses, which are frequently changed because the varying conditions of the circulation produce varying states, not only of the retina, but of muscular action on lenses and in iris. In such cases headache is, I think, too frequently attributed to the eye condition, when both are more likely related to a common cause, disordered circulation. Such patients whom I have been treating with ergot to relieve the headache have often remarked on an improvement in vision and a greater comfort in the use of the eyes in sewing, reading, etc. Sometimes, also, a similar relief has occurred from deafness associated with chronic headache. I will relate a case which I treated in Philadelphia seventeen years ago.

A young woman had come to me from Connecticut with a history of eighteen months continuous headache, which, after a few weeks' treatment with ergot and galvanism, was permanently cured. She had a friend at Bryn Mawr, who also suffered from continuous headache, whom she commended to my treatment. This woman was so deaf that I had to yell my questions into her ear and then was not always understood. She never smiled, but had that serious, anxious and constrained expression characteristic of suffering and isolation. After treating her awhile I had noticed that I did not have to speak so loudly to her, but had not mentioned the fact. One day, about a fortnight after I began treatment, she came in smiling and jubilant and exclaimed, "Do you know, Doctor, I heard my sister play on the piano yesterday?" It then appeared that she was passionately fond of music, and her sister a fine pianist, but for more than three years she had not heard the tones of the piano. She had been treated three years by a celebrated ear specialist of Philadelphia without benefit and, during the same time, by a neurologist, also without relief. Later, she heard my conversation in ordinary tone and was free from headache between treatments. Because of my removal from Philadelphia I was obliged to discontinue my treatment of this case before complete recovery, but there had been such remarkable improvement within a few weeks, both as to headache and the deafness, that recovery seemed only a matter of further treatment.

I can not say all that I desire to say and relate illustrative cases; otherwise I would be glad to detail other cases of deafness in which ergot relieved by contracting blood vessels, and also to relate other eye cases as iritis, retinitis and optic atrophy, in which ergot or ergot and galvanism effected what eye specialists had not only not accomplished, but had declared could not be accomplished. The relief of pain in iritis has been astonish-

ingly prompt and lasting. I will be very glad if some ophthalmologist will give ergot a thorough trial in that painful, serious and so largely intractable affection, glaucoma; not simply as to the relief of pain, for I believe it will be found a valuable curative measure.

PAIN IN GENERAL.

For the relief of pain in general, from toothache to heartache, you will find ergot surprisingly effectual. The man who exclaimed, "Pain is the cry of a nerve for food!" may have recognized his obligation to poetic license, but, so far as it is figuratively true, it depends on a disordered state of the circulation as the cause of the nerve starvation. A more literally correct dictum as to causation of pain would be: "Pain is the cry of a nerve because big bellied blood vessels are squeezing it too harshly." When a sufficient dose of ergot has brought them to a proper respect for the space they should occupy in the economy the nerve will be comfortable and pain will have departed.

I can not help relating, in this connection, another case which later developed two new and important uses for ergot.

A confrère in my town related the case, seeking my advice as to treatment. He had been called to a young man who was suffering intensely from pain between the eyes. He could find no cause for it, and concluded it was neuralgic and gave morphia hypodermically, but without relief, and finally had to resort to anesthetics, as the fellow was frantic from the pain. I recalled the continuous mucous tract from the nose to the frontal sinuses, and thought the pain might be due to extreme congestion of that membrane in the narrow and confined tract, and advised ergot hypodermically should he have another attack. The doctor smiled incredulously, but, as he did not know what else to do, promised to try it. It was not long before another attack did occur, and when I next met the doctor he remarked, "Well, it was very queer, but the ergot did relieve him at once."

MORPHIN POISONING.

To those who have not used ergot broadly its effect in many cases will seem "very queer" until the rationale of its action is appreciated. I do not pretend to claim that my diagnosis in this case was correct, but I do claim that, in some way, that young man's pain depended on dilated blood vessels.

Later, this subject had another of his peculiar attacks, and his physician not being accessible, another was called, who had not heard the ergot story as related to this case and, as it was a matter of pain, he began giving morphia hypodermically, ineffectually and repeatedly until he had given three and a half grains, when its poisonous effects appeared and the patient was relieved of pain, also of perceptible pulse and pretty nearly of respiration. The family physician was then found, and sometime later I was sent for to bring my battery. I took with me a large Kidder coil and an extra cell. I found the patient on the floor, limp, cold, cyanosed, pulseless, even the heart action not discoverable, and respiration but two per minute. It was a long time before there was any evidence of sensation from even the full strength of the coil and a couple of hours before there was any demonstration of pain. At that time, when the application was suspended, he lapsed into the deep stupor from which no other means used to rouse him brought any response. While continuing to apply the faradism, the question occurred to me, "What is the cause of this universal paralysis?" which I expressed aloud, and, having no response, answered myself: "It must be the great vascular engorgement of the brain." With this thought came the idea of using ergot, which I immediately proposed, and this was assented to by the doctor who had given the morphia, but the family physician objected that, as the patient would die in any case, we gave him a hypodermic the family would be sure we

had killed him. I argued, but in vain. Fortunately the family physician soon after remembered an obstetric appointment, and as soon as he left I gave a hypodermic of ergot, with the result that in a brief time the patient, without other means being used to rouse him, sat up awake and clear and conversed with us and did not again relapse.

APPENDICITIS.

A few months after the morphia incident I was called to this same subject, and found him in a high fever, with extremely rapid pulse and the local symptoms of appendicitis. The local pain was so great that he screamed in his agony. The pulse was so rapid that I could only estimate it as about 180. Recognizing the congestive element, I gave him ergot hypodermically, which relieved the pain in a few minutes, and the pulse dropped to 120. When the pain returned the same treatment had the same result. Thinking the case might demand surgical interference, and preferring to share the responsibility, I called Dr. Roswell Park, of Buffalo, who diagnosed appendicitis, but not yet at the stage for operating. The day that Dr. Park was called the patient and his friends believed him to be dying. A clergyman was called from his pulpit, the good-bys were said by the family, and the patient directed as to the postmortem rites. I continued, however, with my ergot, the patient recovered within a fortnight, and I have not known of his having any illness during the nearly eleven years that have intervened.

OPIUM POISONING.

Here are three utterly distinct conditions, all extreme, in the same subject, having but one common element, vascular dilatation, in the relief of which one drug, ergot, was clearly the effective factor. I have not had an opportunity since the case related to test ergot in opium poisoning, but it would certainly be my first resort were I called to such a case, and I would be grateful to anyone who may have opportunity, if he will try it. I would give one syringeful after another of the solution which I shall describe, giving each one slowly (or, as there is usually a multiplicity of doctors, two might be given at the same time, which would hasten absorption) until there was marked improvement in the circulation, even if it required half a dozen or more syringefuls to accomplish it. I am confident that you may safely rely on this measure alone, except that if the drug was swallowed the stomach should be cleansed.

DRUG HABITS.

I have used ergot for nearly twenty-five years in the treatment of the habit cases, both opiate and alcoholic, and believe it to be by all odds the best treatment, not even excepting the "gold cure." I always immediately and wholly discontinue the habit drug and substitute no other. It may possibly be easier, both for doctor and patient, to gradually reduce the quantity for a few days, giving ergot four to six times a day as a preparation for the final total discontinuance; but I have preferred, as a desirable moral element, to demonstrate to the habitué that neither his habit-narcotic nor any other is necessary to him in any degree. If, in the case of opium addiction, the drug is immediately and wholly discontinued without previous preparation by the ergot, the reaction that occurs during the twenty-four hours following the first twenty-four or thirty-six hours of abstinence is sometimes so appalling that it requires as much moral force on the part of the physician to do his duty as any other situation in which he is placed. He is quite likely to think more of the condition which confronts him than the theory he started to demonstrate; yet, I assure him, he may hold to his theory if he does not forget his hypodermic and his solution of ergot. After that critical twenty-four hours the treatment is easy.

DELIRIUM TREMENS.

In delirium tremens ergot is *the* remedy to calm the mental and physical excitement. A man was brought into my office in such physical and mental agitation that it was with difficulty that I gave the first hypodermic of ergot, and he left the office within an hour as calm and rational as anyone before me. No other drug will so promptly set a man on his feet after a debauch, or so thoroughly clear the head and put one "in condition" after a night's dissipation; and, in the graver sequels of prolonged alcoholic hyperemia of nerve centers, such as paralysis and coma from the pressure of exudates, you will be most agreeably surprised, to put it mildly, at the results of a few hypodermics of ergot. Indeed, to correct the conditions which produce exudation in general and to secure the absorption of the exudates, from simple edema of the feet to serious apoplexy, you can not do better than to give ergot by hypodermic injection. Please treat your next case of edema of the larynx in this manner.

ASTHMA AND OTHER SPASMS.

Since reading the Chautauqua paper, I have been asked as to the danger of producing spasm of sphincters or bladder. In an experience of more than 25,000 hypodermic injections of ergot, in some instances having given ten ordinary syringefuls in twenty-four hours (the equivalent of one-half dram of Squibbs' solid extract, or two and one-half drams of the powdered ergot), I have never observed any such effect; and not more than half a dozen times have I produced spasm of the womb from giving a little too much ergot during the menstrual activity. Considering the cause of spasm in general, which is either irritation from dilated blood vessels in motor centers or peripheral irritation of sensory terminals from the same cause, reflected through motor centers to the muscles involved, ergot would appear to be indicated rather than contra-indicated in spasm. I know that in many spasmodic or convulsion conditions ergot is beautifully effectual in relieving. Asthma has yielded in a few minutes to ergot, even when the attack has been extreme and prolonged; and many cases of uremic convulsions have been as promptly relieved by ergot. When I speak of using ergot, I always mean hypodermically, as I have no confidence in its desired action when administered by the mouth, which is often, also, offensive to the stomach. The two methods are not to be compared as to their desirable results.

PUERPERAL ECLAMPSIA.

Obstetrics is out of my sphere of practice, and I have had no opportunity to demonstrate the applicability of ergot to puerperal eclampsia, but, considering its essentially-like causation to that of uremic convulsions from toxins, which disturb the circulation in nerve centers as well as the probable inefficient glandular activity in eliminating those poisons, I do not hesitate to commend its trial in that affection, believing that happy results will be obtained. Doubtless many will hesitate to give ergot to the pregnant woman, but I have frequently so used it without ill results, and I have had the assurance of a celebrated gynecologist that he would use it in pregnancy if indicated. In the convulsions occurring before or during labor, I would use it cautiously, but after the womb is emptied, I would use it freely and would expect to see brilliant results.

HYSTERO-EPILEPSY, CHOREA, ETC.

Had I time, I would relate a striking case of hystero-epilepsy of considerable duration who, during the convulsions, required half a dozen men to hold him in bed

and who was practically cured from the first hypodermic, no further convulsions occurring. In the same way, I have relieved ordinary hysterical convulsions in a few minutes. The cataleptic hysteric is a typical case for the administration of ergot. With ergot you will cure the acute choreic promptly instead of waiting weeks and months, perhaps vainly, for the action of tonics and nerve sedatives. The old chronic choreic as well as the chronic sufferer from paralysis agitans you will not promptly cure, but you will promptly benefit and accomplish more with ergot than with any other drug. In infantile convulsions and paralyzes and in the night terrors of children I earnestly commend to you the use of ergot, but I also commend the careful inspection of prepuce and clitoris and the correcting of their abnormalities. Indeed, in all convulsive and nervous conditions not clearly related to toxic influence examine carefully the sexual and pelvic organs for primary causative irritation, after which consider the digestive tract.

In epilepsy you will have all the advantages from the use of ergot that you have had from the bromids, without the latter's tremendous disadvantages.

BULBAR PARALYSIS, PARESIS, ETC.

As illustrative of the successful use of ergot in a condition regarded as incurable, I will relate another case.

Ten years ago a man came to me to have the galvanocautery used on the back of his neck. He said, in effect, that he had consulted neurologists in Buffalo and New York, who had agreed that he had a fatal disorder, bulbar paralysis. The New York specialist exhibited great interest in his case as a rarity, and assured him that his was a beautiful case, but that all such cases progressed to fatality, though, possibly, cauterization might give him some temporary relief or extension of life. I saw that the poor fellow was frightened almost to death and, while he was not there to consult me, humanity led me to attempt to modify the influence of the unfavorable prognoses and to say that I thought that some other treatment would be much more beneficial than what he came for. He was in a state of mind to grasp at straws and requested me to treat him. I do not answer for the diagnoses, but they were made by those whom I regarded as more competent than myself. My own judgment was rather that he was developing general paresis. However, I treated him thoroughly with ergot and galvanism and he had no other treatment except buckthorn as a laxative. He made a rapid recovery, and has been in good health since and active as a public speaker.

I have had well-established cases of general paresis so improved by ergot that I questioned the correctness of my diagnosis, and I believe that if paresis could be so treated in the early stage it might be cured.

ACUTE INFLAMMATIONS.

Another class of diseases should be considered in relation to ergot, the acute inflammatory. It is surely rational to assume that ergot is indicated here, for the central element is dilated blood vessels, and ergot does contract the dilated blood vessels. But, better than theory is demonstration, and I have repeatedly demonstrated its value in meningitis, pneumonia, peritonitis, appendicitis, metritis, tonsillitis, erysipelas, erythema and inflammation of veins and arteries. The nearer to the initiation of inflammatory states you apply ergot, the more beautiful will be the demonstration of its effective action. I have also used it largely in the zymotic diseases to control or modify local hyperemia, which give pain and discomfort. I know that it is possible to make even the very sick comfortable, and there is some satisfaction in being comfortably sick. The sequellæ of influenza, the most serious part of that disease, local passive

congestion in one or more vital organs from paresis of vaso-motor centers, are relieved by ergot, though often slowly, as the influenzic poison has a peculiarly persistent depressing action on the sympathetic ganglia, but persistent use of ergot will overcome this.

TYPHOID FEVER.

I will be very grateful if some of you gentlemen who frequently treat typhoid fever will use ergot from the beginning. I am sure that by it you will accomplish several desirable results; limiting the local inflammation that so often leads to hemorrhages and perforation, the fatal elements of the disease, securing better elimination of the septic contents of the bowel by stimulating its muscular coat, preventing the head symptoms by holding the circulation there in tone and, by its effect on the general circulation, relieving the work of the heart.

ANGINA PECTORIS AND OTHER HEART AFFECTIONS.

There is still another class of disorders in which ergot stands pre-eminent as a means of relief—I refer to all those conditions, whether in kidneys, liver, lungs, brain or digestive tract, which produce functional and sometimes, later, organic trouble in the heart. It appears to me that quite too much attention is given to the heart in many cases and not enough to the conditions that have produced and are producing the symptoms in the heart. In general, the heart symptoms themselves and the remote states of disturbed circulation which produce them will be more effectually corrected by ergot than by any other drug of the *materia medica*. To use a pertinent slang expression, "It makes me tired," as the practice makes the poor hearts of the subjects so treated, when I think of the prodding and spurring of that overwrought organ by all the heart tonics and heart stimulants the doctors can think of, or, in other cases, lowering its force by sedatives and depressants, when the real indication is to remove the conditions which are overworking it or the conditions which are irritating its motor center; in other words, securing as promptly as possible approximate equilibrium of the circulation, to which end ergot is the desideratum. To this end I declare ergot to be tenfold more valuable and efficient than all the heart tonics, heart stimulants and heart sedatives combined. Do not understand me as condemning these classes of medicaments. I am only condemning their improper use. A disorder associated with what I have been saying is angina pectoris, in which I have used ergot with the happiest results. I recently heard a paper on that subject by a prominent practitioner personally known to many of you. I was asked to take a part in the discussion, and commended ergot. The physician promptly replied that "of all drugs, that one was most contraindicated." I will only say that if in angina pectoris or any other affection you deem it undesirable to make the labor of the heart as easy as possible by removing barriers that it can not surmount and lifting loads that have fatigued it, or undesirable to calm excited nerve centers that have made its action tumultuous and straining, then do not give ergot, for it is surely then contraindicated.

PRELIMINARY TO OPERATION.

I will detain you with but one more suggestion as to the therapy of ergot, which leads me into a field whose workers are not much given to the use of medicaments. And yet I am convinced that this one drug will be found by the surgeon who fairly tests it in his practice as valuable and necessary for the purposes which I shall point out as anesthetics or antiseptics for their especial

purposes, and more valuable to him than any other drug outside of those classes.

The present era of surgery is the most brilliant of all history, so brilliant that the mind that contemplates it is dazzled as the eyes are dazzled by looking at the sun. The foundation on which this grand superstructure has been builded is antiseptics, the destruction of those microscopic organisms whose presence in wounds produces inflammation, which has always been the Waterloo of surgery. It is no disparagement to modern surgery to recall that before the day of antiseptics the surgeon was not always defeated; that, indeed, his victories were counted by the thousands and tens of thousands; and why? We surely can not assume that the bacterium did not then exist, any more than we can assume that the mass of mankind who do not develop tuberculosis are never exposed to its bacterium. There was in those successful cases a condition that prevented the fatal activity of the bacteria. I believe that the explanation is to be found in the state of the circulation. Inflammation can only follow congestion, and congestion can only occur when the walls of the blood vessels in the injured or wounded part have not sufficient tone. Where there is not that sufficient tone ergot will develop it, and this is the function and province of ergot in surgery. In all cases where there is time and opportunity to prepare a subject for operation by a preliminary course of ergot it should be done as carefully and conscientiously as you would secure the most perfect antiseptics during and following the operation. When the subject can not be so prepared in advance, the administration of ergot should be made hypodermically before and during anesthesia and operation and afterward until the healing is complete. You will find that the subject who has had a proper preliminary preparation by ergot for operation will have little or none of those distressing and often seriously objectionable accompaniments and sequellæ of anesthesia, nausea, retching, vomiting and delirium; and fluid nutriment may be safely given, as a rule, within a couple of hours after operation and at intervals thereafter.

SHOCK.

That great immediate dread of the surgeon, shock, will also be wholly prevented or greatly modified; and in those cases in which shock has preceded the surgeon's relation, ergot will quickly prepare the subject for prompt and safe operation, when delay or the imposing of operative shock on the previously shocked nervous centers would be fatal. Pain, for which the surgeon is accustomed to administer morphia, a drug that congests and disturbs every vital function, will be prevented by keeping the circulation under the influence of ergot, for it is congestion which determines the pain. Thus morphia may be avoided, which is always desirable; but if it must be administered, combine it with plenty of ergot to prevent its undesirable effects. After operation the thing desired is repair, and the sooner it is accomplished the better for the surgeon's reputation and the patient's satisfaction and future usefulness.

When you read in the evening paper: "Mr. John Jones was operated on to-day at the Blank Hospital by the famous Dr. Blank. The operation was successful." And, a few days later, you discover Mr. John Jones' name in the obituary column, it means that there is something more to be desired than surgical skill and the bacterial destroyer. That desirable thing is a proper activity of the circulation in general and, in particular, in the region of the operation. That proper activity is only

secured by a certain caliber of the vessels which carry to and from that region the nutritive fluid, and I feel that the most important message which I bear to you tonight is that ergot will, more surely and effectually than any other means, determine that proper caliber; whether for repair of a wound after operation or for aborting or minimizing an acute inflammation, or for raising the blockade that has wearied or exhausted the heart, or for relieving a coma or paralysis or convulsion, or for promoting the absorption of exudates, or for restoring normal function in an organ, or for calming an excited nerve center, or for relieving pain, or for simply restoring that general equilibrium of the circulation which warms the cold hands and feet, cools the hot brain and brings to an unhappy mortal, calm, comfort and peace.

Now, as a stranger to you, and without the weight of that bubble, reputation, to impress my words on you, I will confess that I do not expect you to accept now, nor until you have made the demonstrations for yourselves, all the claims I have made for ergot. I know that much of what I have said is novel to the mass of the medical profession and, in the developing of the application of ergot to disease, I have often scarcely credited my own senses, so astonishing was its action. I know, too, that a widespread prejudice exists against ergot; that it is regarded by many as a criminal among drugs. Patients of mine traveling abroad have been unable to purchase it in some countries of Europe, being told that it was a rank poison, and many physicians in this country have expressed the same view. At the sacrifice of conventional form in medical literature, I have endeavored to impress on you more strikingly the facts I had to present, the theories I wished to express. If I have so far succeeded in awakening your interest in ergot as to lead you to a wide and widening practical application of this efficient and remarkable drug, my mission tonight will have been attained. How you may regard me, concerns few beside ourselves. How you may regard ergot, vastly concerns thousands whose lives and futures will be placed in your hands in the years to come. You may have been impressed that I have a kaleidoscopic view of ergot or that it is to me like a musical instrument, a harp of a thousand strings, on which I play many tunes. If you will analyze all that I have said, you will find but one chord, one string, that makes, like Paganini's, many tones; which, unlike Paganini's, are harsh and inharmonious, unhealthy. All that is novel in the broad therapeutic application of ergot is the recognition of the varied, unhealthy tones of that one chord in all the diseases I have mentioned. That chord is *abnormally dilated blood vessels*. Ergot is the master hand whose magical touch vibrates them to harmony and health.

THE MODE OF PREPARATION AND OF USE.

Since the publication of the Chautauqua paper I have had so many inquiries as to the preparation I use, dose, method of administering, etc., that I will anticipate such inquiries in relation to this paper. I have experimented with a great many solutions which I have made, the object of which was to find that antiseptic which would best preserve a watery solution from bacterial development, toward which there is a great tendency in ergot, and to avoid the pain in introducing it hypodermically, and to prevent local congestion or inflammation at the region of application. I discarded three classes of antiseptics, the mercurial, from the great irritation; the iodine group, because of their tendency to set free the iodine, and the earbolic acid group, because of the tendency to produce a turbid state, a suspension of a fine precipitate which

filtration would not correct. I have also experimented with every preparation of ergot to which my attention has been called, only to discard all except the preparation of aseptic ergot, which is put up in tiny bottles, hermetically sealed, each containing one ordinary dose. This solution is the most satisfactory of all the preparations I have experimented with except my own solution, and I do not hesitate to recommend it. However, I prefer this solution:

Squibbs' extract of ergot 1 drachm, dissolved in solution formalin (1/3000) one ounce. Mix.

The distilled water should be boiled to sterilize, and, after cooling, the formalin added before the ergot is dissolved. The solution should then be filtered. You should not allow yourself to get out of this solution, for, curiously, a solution that has been made a few days is more satisfactory to the patient, giving less hurt, than one freshly made. Until the last two years I purchased the ounce or 25 gram jars of Squibbs' extract, but I much prefer, as being less troublesome and being always surely aseptic, the drachm packages wrapped in tinfoil, which my friend, Dr. E. H. Squibb, has been preparing for me. In making the solution great care should be taken to have everything used in the process thoroughly sterilized. It is better to keep in a cool place and protected what you do not carry with you. I regard the syringe used and the care of the needles as important. The best syringe is a glass one with asbestos plunger. As avoiding trouble in refilling, I prefer a syringe that holds a drachm or more. I always scour the needles, after each use, with sapolio, having filled the syringe with distilled water, which I throw through the needle slowly and continuously while drawing it from base to point between thumb and finger, which holds some powdered sapolio, then rinse well and dry with tissue paper outside and the inside as well by screwing the needle on a cone of the tissue paper, afterwards wrapping each needle in a bit of tissue paper, which sufficiently protects it.

A minimum effective dose, for an adult, of this solution, I would regard as 15 minims, but I seldom give less than an ordinary hypodermic syringe-ful, 25 or 30 minims, and often two such syringe-fuls. In extreme cases, as uremic convulsions, I have given four such syringe-fuls. One syringe-ful will generally relieve even a bad headache, but if not relieved in half an hour, repeat the dose.

It is always well to continue to use ergot, where there is a congestive tendency, for some time after symptoms have disappeared. The largest quantity of ergot that I have given in twenty-four hours is ten ordinary syringe-fuls.

As to the place of application, I prefer the deltoid of the left arm. It seems better to inject into muscle, but the space between the scapullæ is a good one to inject under the skin. Unless there is good tone in the blood vessels where it is injected, ergot will cause some congestion and sense of soreness until a few doses have improved the tone of the circulation, after which the patient will not mind the injections. Sometimes it would be a good precaution and never out of place to especially cleanse the skin where the needle is to be inserted.

I have never had an abscess purely from ergot, not a half dozen in all my experience, and those clearly explicable, as from an associated irritant. Always inject ergot slowly, keeping the finger on the stem of the

plunger and against the base of the syringe, to avoid suddenly throwing in too rapidly because of irregularities in the bore of the syringe or inequalities of pressure.

Finally, as to ill effects in general and, in particular, that dreadful sequence, ergotism, I am reminded of a celebrated chapter, whose title and text I will quote:

"On Snakes in Ireland.

There are no snakes in Ireland."

I have had a large experience with ergot, and I have never seen a suggestion of ergotism, nor any other effect that I could denominate ill. If you are looking for "snakes" in ergot, you must search elsewhere than in Squibbs' tinfoiled lozenges, and I think you will fail to find them lurking in the tiny bottles of aseptic ergot.

With a proper solution and the syringe and needle sterile, use ergot freely until you have secured the desired effects, and do not lie awake at night in dread of "snakes" in ergot.

DISCUSSION.

DR. F. H. WIGGIN, New York, said he could corroborate many of the statements made in the paper. His first trial of ergot was in a case of very dangerous intestinal paresis following a difficult laparotomy. The patient received ten syringefuls in 24 hours and was greatly benefited thereby. Administration continued on signs of relapse and recovery was uneventful thereafter. The drug was also useful in controlling nausea following anesthetic. The pain of acute articular rheumatism and also the morphin habit were controlled by it.

DR. O. W. S. TOMS, Nyack, N. Y., described a severe case of acute pulmonary edema which had yielded most satisfactorily to two syringefuls of Squibb's ergot solution. The attack had been brought on by disturbed compensation of the heart. Another interesting case reported in detail was one of severe purpura associated with rheumatoid and neuralgic pains and hemorrhages from the bowel. There were recurrences of eruption each time the patient came out of the influence of morphin. Finally ergot was given hypodermically with remarkably good results. Two injections were given daily for a few days. After each administration the rash became dark and was quite pale by the next day.

DR. CHARLES PHELPS, New York, had found ergot very useful in arteriosclerosis, and believed it should prove of value, in cases of cerebral confusion.

DR. WILLIS E. FORD, Utica, N. Y., said that even though some of the claims made in the paper seemed hard to believe they should be accepted with confidence, for he could personally vouch for Dr. Livingston's experience and diagnostic ability in the field of neurology. He had found ergot useful in subinvolution and chronic metritis responsible for failure of lactation. It was difficult to believe that this drug could take the place of well-known heart tonics and stimulants, but if it were so ergot would certainly assume a new prominence.

DR. ALEXANDER LAMBERT, New York, said he had recently made an extensive trial of ergot. The first case was a desperate one of angina pectoris, in which the usual remedies had utterly failed. In 10 minutes after the first injection of ergot he was completely relieved, and this experience was duplicated in several subsequent attacks. In a case of opium poisoning the use of ergot had permanently restored the patient to consciousness. A most interesting experience had been with 10 cases of alcoholic wet brain in Bellevue Hospital. Formerly under the most approved treatment this class of cases had yielded a mortality of 95 per cent., but in the present series, treated by ergot in doses of 15 minims every 2 hours, 7 cases out of 10 recovered. Ergot was also of greatest value in relieving the depression and tremor of ordinary acute alcoholisms. He had used ergot also in several cases of severe alcoholic pneumonia and in pulmonary congestion and edema with the most satisfactory results. One case of surgical shock was reported in which ergot had controlled severe shock promptly

and had enabled an urgent operation to be done successfully.

DR. EDWARD W. LEE, New York, said that for many years he had used ergot with apparent benefit in chronic hypertrophy of prostate and in acute inflammation of this gland.

DR. LIVINGSTON, in closing the discussion, said he had used ergot in cases of concussion of brain with decided benefit.

Special Article.

THE TYPHOID EPIDEMIC AT ITHACA.*

(By Our Special Commissioner.)

I.

The city of Ithaca is most attractively situated in central New York at the upper end of Lake Cayuga, about one thousand feet above the sea level. The location and surroundings suggest unusual healthfulness, and, with a single exception, to be noted presently, there has been, up to the present year, no markedly excessive prevalence of disease. According to the United States Census for 1900 the death rate for that year was only 16.3. The town is reported as having 194 manufacturing establishments with an aggregate capital of \$3,000,000, but it is chiefly celebrated for being the seat of Cornell University, and is pre-eminently a college community. During the college year the student population constitutes nearly one-fifth of the total number of inhabitants.¹

In the matter of general cleanliness and attention to garbage disposal and other sanitary details, Ithaca does not impress one as being any more lax than scores of similar communities. Indeed, it is probably considerably superior to most non-college towns of its size and surroundings, and so far as appears, there has been only a single indication that Ithaca was not an unusually healthful community.

PREVALENCE OF TYPHOID FEVER IN FORMER YEARS.

For many years prior to the present outbreak typhoid fever, or a disease closely resembling it, so far from being an uncommon disease in Ithaca, has been rarely absent. A low type of fever, deemed by some so peculiar to the town that it has been honored by the designation of "Ithaca fever" (save the mark!) has occurred with varying severity for years. In the year preceding the present epidemic, cases of "Ithaca fever" and kindred illnesses appear to have been especially numerous. According to the official record of the university infirmary, "eighteen cases of typhoid and enteric fever, some of them very severe," were cared for in that institution during the year 1901-02. I have found that not infrequent mention of cases of typhoid fever occur in the files of a local newspaper during the months of January and February, 1902, and it is well known among the Ithaca physicians and some of the townspeople that a considerable number of cases of "fever" occurred at that time. In

* It is to be understood that the matter appearing last week was merely a preliminary statement based on information then obtainable.

1. Population, U. S. Census, 1900, 13,136. The number of students recorded in the University Register at the beginning of the year 1902-03 was 2,686, but 165 of these were residents of Ithaca and are probably included in the census enumeration.