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"Je prends le bien ou je le trouve."

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Tape Worm—The Symptoms, Progress, Development, Duration and Special Treatment of a case.*

The writer was for several years a subject of the disease of tape worm; a statement of his case may prove beneficial to others similarly affected. It is given as follows:

During the year 1835 he had frequent attacks of what was supposed to be cholic, returning at intervals, to January, 1837; but not of a character to excite much alarm, though accompanied by sick stomach, predisposition to vomit, and piles.

The usual alleviatives for the supposed disease, were resorted to without relief; the patient being also subject to frequent cramps of the abdomen, in the region of the right side, especially after inclining the body downward in that direction, on resuming an erect posture.

At the time last named (January, 1857) the disease was demonstrated to be tape worm, by the voluntary es-

*The above report is by a distinguished gentleman of the legal profession in this city. We regard the paper a highly useful one, for while this report is accurately and intelligently made, the statement is freed from a vast amount of unnecessary detail, which too often encumber the reported cases of medical writers. The absence of technical terms, apologized for, is not to be deplored and will be regarded by our readers rather a relief than otherwise.—[Eds. S. M. & S. Jour.]
cape of several separate joints, crawling away, they being alive and continuing to move by extension and contraction. The specimens were of rather a flat round, an inch in length near the size of a common broom straw, square at one end and tapering at the other, and most exceedingly tenacious of life under experiments, to which they were subjected.

The escapes, either voluntary, in detached pieces, or on being expelled by remedies, sometimes in joints and at others in continuous pieces, varying from 3 to 14 feet in length, continued to May, 1841, at an average per day of 12 joints, or one foot; though irregular, sometimes daily and then at intervals of 3 to 5 and 10 days, increasing in quantity in proportion to the length of the interval, the voluntary escapes producing an unpleasant itching and tickling sensation about the anus.

In these intervals the abdomen became distended and painful, the breathing short, with frequent cramps, such as before described, accompanied by an internal lowering down of the intestines and aggravation of the piles. Throughout the disease, contrary to the generally existing belief in the subject, that in such cases the patient was subject to a ravenous appetite, in this instance it was the reverse, being quite moderate, the health very delicate, and a general debility of the system.

From the development of the disease to the cure, many physicians were consulted; but four of whom professed any practical knowledge as to the disease or its treatment. It being, I suppose, somewhat rare, there being but two who prescribed remedies producing any sensible relief.

The first was the family physician of the patient, the late Dr. Milton Antony, distinguished for his skill in the science of his profession, at the head of which he stood in this, his native State, and the first President of the Faculty, and founder of the Medical College of Georgia, which position he retained during his life. He was first consulted and prescribed spirits of turpentine, which finally effected a remedial cure.
The other was quite a young, but very intelligent gentleman, Dr. Thompson, not a graduated M. D., but a man of reading, who was met with in 1838, in Louisville, Ky. He prescribed assafetida and gum camphor; in parts of $\frac{2}{3}$ of the former to $\frac{1}{3}$ of the latter. This produced temporary relief; the assafetida, acting as a gentle cathartic, relieved the bowels of the accumulation of the disjointed pieces of the worm; while the camphor counteracted the too great relaxing tendencies of the other component on the system. These two remedies were resorted to alternately from 1838 to 1840, the pills being taken from 3 to 5 at a dose.

The prescription of Turpentine and the mode of administering it were as follows:

Fast 12 hours (or rather abstain from all but liquids), then empty the bowels with salts; afterwards take a teaspoonful of spirits of turpentine in loaf sugar, and this repeated in 15 or 20 minutes, and followed by castor oil in thirty minutes.

This course was always effectual in expelling portions of the worm; but its effects on the system of the patient were such as to deter a repetition until compelled by after accumulations and the accompanying symptoms before described; it leaving the patient under strangury and a general affection of the kidneys and spine, and consequently was not resorted to except from necessity, and at intervals of 2 to 3 months. In the meantime the pills were taken for temporary relief; but the odor being so offensive as to deter their use as long as could be dispensed with.

The gentleman who prescribed the pills, though not a regular practitioner, had been compelled to put into requisition his skill, as an acting Assistant Surgeon, at a United States Military post in the West, in the absence of any one regularly in charge, of that department, and during such time he stated that two cases of similar disease had been temporarily relieved by that treatment; and in the case of the writer the prescription came fully up to the representation.
In 1839 the lamented Dr. Anthony was one of the early victims of the yellow fever of Augusta of that year, and the patient was deprived of the further benefit of his skill and left to the use of his prescribed remedy at discretion, and having read some few miscellaneous articles on the subject, and attentively noticed the effects of the prescription in the disease, as well as on the system, it occurred to him in the fall of 1840 that there might be propriety in varying the manner of administering the turpentine from two teaspoonfuls at an interval, to that of the whole quantity at one dose. He made the experiment, taking a desert spoonful at one time. The change was successful, acting instantaneously and directly on the worm, aiding the oil as a cathartic without entailing the previous injurious effects on the kidneys and spine and resulted in expelling 14 feet.

Thus encouraged, it was repeated at shorter intervals, with similar success, the specimens exhibiting irregular and imperfect formation; but showing that there was a square break-off, leaving a portion behind. Again, in 1 to 4 weeks this treatment was repeated till 1st of May, 1841, when 5 feet was expelled, tapering from the full size at one end to nearly a point at the other, having rather a soft, jelly-like appearance. This suggested the propriety of immediate perseverance, and the treatment was repeated in 3 to 4 days, which happily resulted in bringing at that time 3 feet, about half the usual size at the large end and tapering to a point at the other, not longer than the point of a common darning needle, perfect in formation, the joints shortening as they decreased in size. At the time, this was believed to be an entire relief from all remains of the worm, and has been verified by a lapse of near 20 years without any returning symptoms whatever.

It may be remarked as showing the obstinacy of the disease and the tenacity of the worm, that during its continuance the writer was, in 1839, a subject of the yellow fever, having a dangerous attack, and for which he was treated with the appropriate remedies for that disease. On conva-
Lescing, he flattered himself that the remedies for the fever had subdued the worm; but was disappointed in finding that by the time he was able to leave the house the old disease returned in all its symptoms.

The appearance of the disjointed portions have been described. Those connected, of various lengths, resembled gourd seeds strung lengthwise on a thread, and varied from 3 to 14 feet.

After a lapse of some 10 years the case, with the particulars, &c., was related to a friend, a highly respected and eminent gentleman of South Carolina, and which had passed from the memory of the writer, till recalled about 3 years since by a letter referring to the circumstance and stating that he had a son 10 years of age similarly afflicted; and that none of the physicians consulted seemed to understand either the disease or remedy, and requesting a full statement of my case with the symptoms, prescriptions, &c., it was given with full directions; but suggesting the propriety, if the turpentine was resorted to, of leaving it to a physician to prescribe the decrease in the proportion for the child, as compared with an adult.

Some two or three months afterwards a second letter was received from this friend, communicating the pleasing intelligence or his having used the prescription as directed, with complete success, his son being entirely cured, and expressing his grateful acknowledgements, and the belief that I had, under Providence, been the instrument in saving the life of his child.

Considering the result in this latter case as establishing the efficacy of the remedies in the two, it was determined at some leisure time to make a statement of the same for the benefit of the public, waiving all apparent delicacy involved, believing that the cause of humanity demands it, that purpose has been delayed to the present only by other engagements.

Medical readers, as well as others, will, doubtless, make due allowance for the absence of the use of technical terms by one not versed in them.
ARTICLE XI.

Rectal Touch in early Pregnancy. By Martin Bellinger, M. D., Barnwell, S. C.

The diagnosis of utero-gestation has drawn the attention of medical philosophers from the earliest age. Its importance behooves every one to investigate the signs closely, for at every step in professional life occasion may call for a prompt and decisive opinion. Not only in a medico-legal point of view is it of importance, but the moral integrity of the family circle may rest on the medical man to establish, or refute the suspicion of conception, and his fiat consigns to ignomy or restores to social purity. The suspected female may traverse an humble path, may be a slave to minister to the wants of those to whom God has given her services, but her social rights must be maintained. She may be the highest lady in the land, whose hand it was an honor to touch, and yet the fell suspicion can rest heavily on her and drive her to seek companionship with degraded beings. Her own sex would be the first to spurn, for her hypercritical at all times towards each other, they pitilessly lash the fame of the frail sister who deviates from rectitude. More vindictive than the slough hound, for he pauses at blood; the shroud of female scandal often envelopes the pale remains of the fallen.

The object of this paper is to call attention to an important element in the physical diagnosis of pregnancy. It is presented in this crude form in the hope that some of my professional brethren may deem it of sufficient moment for the subject of investigation. To those of ample obstetrical practice, each day will furnish opportunity for the truth of the sign herein mentioned, and to those I look to prove its truth or falsity.

I will briefly relate the circumstances which led me to its observation. Several years since, when first commencing to practice, I was requested by Mr. Andrew Dunbar, a planter of this vicinity, to ascertain if one of his negro women was pregnant, the work allotted to such being lighter
than otherwise. She was said to be two months advanced, I found morning sickness, suppressed menses and depression of the uterus with enlargement of its neck. The mamma afforded no evidence, as she was nursing a twelve months child, which, of course, roughened the nipple. In addition to these signs I could detect no evidence of disease, nor was there any complaint made. My opinion, therefore, to the owner was that though far too early to form a positive one, in all probability the woman had conceived.

Time proved it to be a false diagnosis—the woman was not pregnant. It was a case of amenorrhoea, with slight engorgement of the cervix uteri.

Charles West says, that he who learns truly from personal observation, derives benefit even from his errors; that his mistake will serve as beacons to indicate the breakers among which he was once wrecked. But the lesson taught here—never to give an opinion till the case was sufficiently advanced to be unmistakable—was of little avail. For, in a practice almost entirely of negroes, where the question of morality could never be considered, cases of amenorrhoea would come and had to be discriminated from pregnancy. And frequently it is of primary importance to know the true uterine condition to avoid the detrimental use of certain drugs.

So that whether I expressed an opinion or not, I was often compelled to form one or refrain from decisive treatment of the case.

Tired of this uncertain course, I read every available work relative to the subject, but none, not even the work of the great Montgomery, afforded satisfaction. My attention was, however, drawn to Meigs' two recorded cases of absence of the uterus, and especially the means by which his opinion was formed.

In case No. 1 he writes: "I requested the lady to lie on her back, and introducing the index finger of the right hand
as far as possible into the rectum, I explored with it the excavation of the pelvis, in order to discover any tumor or organ that might be contained within that cavity; but as all the tissues were ductile and very yielding, I began to suspect there was no womb in the case. Therefore, laying the fingers of the left hand upon the lowest part of the hypogastric and pressing them firmly towards the finger that was used in exploring the internal parts, I found they could be brought so near each other as to make it perfectly clear that there was no womb in the case; otherwise I must have felt it, so near was the approximation of the fingers of the right to those of the left hand.”—(Meigs' Treat. Obstetrics, p. 153.)

Whilst a student I read the above case, merely regarding it as a good description of lucus naturæ. Now it acquired the utmost importance, for the deduction drawn was that the same procedure by which the absence of the uterus could be noted, would determine not only its presence but condition whether enlarged or not.

Since then I have in numerous instances put the idea to the test of experience and every investigation, but serves to confirm my opinion of its value.

I can speak with confidence as regards the rectal touch of pregnant and unpregnated uteri of child-bearing woman. It has never fallen to my lot to examine the virgin uterus.

The normal position of the unimpregnated uterus of the child-bearing woman is with its fundus on a level with the interoseous cartilage of the first and second vertebrae. This point is distant, per rectum, from the anus about 4 1/2 inches. If the anus is pressed strongly toward the uterus the distance is lessened from 1/4 to 1/2 inch. When conception takes place the uterus, increasing in weight, descend still lower, there to remain till a little beyond the third month, when it gradually ascends into the abdomen.

When a woman is to be examined, she may be placed on her back, or what is better, on the left side in the ordinary
obstetric position. One hand of the accoucheur is placed on the hypo-gastrium and pressed firmly downwards and backwards toward the uterus. The middle (being the longest) finger of the other hand is well oiled and passed into the rectum as far as the metacarpo-phalangeal joints. The finger now comes in contact with the uterus, situated anteriorly. If pregnant it will be found encroaching on the rectum, its characteristic pear-shaped enlargement well defined; if not pregnant, the finger carried strongly forwards ascertains its size.

The second and third months are the most favorable periods for exploration for then the uterus is fully within reach of the finger and its enlargement more plainly noted. But even up to the fourth month it can be examined with sufficient accuracy to form a diagnosis.

It may be established as a principle that the uterus in the female can be examined per rectum with the same facility as the prostate gland in the male, and any deviation from the ordinary size as accurately detected. On this principle resting this simple means of diagnosis. Applicable only to the early months, at a time when all other symptoms are obscure, it is of great value. As a negative sign it is absolutely certain, for the absence of uterine enlargement indicates its non-impregnated condition. It is not an absolutely positive sign because merely increased uterine size can never be held as pathognomonie of utero gestation. Here the method of diagnosis by exclusion must be instituted, having reference to uterine hypertrophy, tumors, &c. And when the enlargement is pear-shaped, when its progressive increase corresponds with other (per se equivocal) signs of pregnancy and where there is an absence of all evidence of disease, the woman on the contrary in blooming health, we will have woven a tissue of evidence before which all doubts must vanish.
A *Diagnosis of the Dislocations of the Hip Joint* By Horace Neeson, M. D., Augusta.

[As a supplement to an excellent inaugural thesis, our friend Dr. Horace Neeson, presents the following suggestions on the diagnosis of dislocations of the hip joint. It is highly gratifying to us to find that the prolific idea of our distinguished colleague, Professor L. A. Dugas, has been so ingeniously extended and applied by one of his own pupils in the Medical College of Georgia. It will be remembered by our readers that Dr. Dugas presented his new method of diagnosis in a communication to the American Medical Association during its session in the city of Nashville, Tenn., in the year 1857, and that it was published in the succeeding volume of the Transactions of that body as well as in this journal, with four excellent photographic wood cut illustrations, showing definitely the idea of the author. Dr. Neeson, whose ingenuity and thorough apprehension of the principle, is not the less entitled to great credit, deserves the thanks of the profession for thus adding his own valuable quota to a, sometimes, difficult point of diagnosis.—[Eds. S. M. & S. Jour.]

It has ever been the desire of man to do something for the good of his fellow man, from the raising of a blade of grass to the giving up of his life for a friend, so have I added this diagnosis in my thesis with the, perhaps, presumptuous hope of assisting my fellow students, and not with any view towards extending it over a greater space. In studying Professor Dugas' diagnosis of the dislocation of the shoulder joints, I concluded that as the mechanical arrangement of the glenoid cavity in the upper circle of bones resembled that of the acetabulum in the inferior circle, that this diagnosis could be applied to the dislocations of the former, if I could learn the principle upon which it acted. According to a well known geometrical axiom, "the zadii of all circles of the same length and with the same axis will describe the same arcs."
Now, in the dislocation of the shoulder joint, if we take the glenoid cavity as the axis of a circle and the humerus as its radius, it will describe many arcs of circles, in this position which it will be impossible for it to do in the dislocated state. One of these arcs which it describes in the normal state is the placing of the ulna radial end of the humerus against the piaeties of the chest and moving it upwards towards the ensiform cartilage until the hand of the rotating arm can be placed upon the sound shoulder. This circle, or segment of a circle, our distinguished Professor of Surgery has often proved to be impossible for it to describe in the dislocated state. Now, if we will, in like manner take the acetabulum as the axis of a circle and the os femoris as one of its radii, we will find it will also describe arcs of circles in its normal position which are impossible for it to perform in the dislocated state. The most prominent of any of these arcs, that I have noticed, is that described by the os femoris in crossing the legs. If we thus cross the legs in the sound subject by letting the ankle fall, or pass just over the external condyle of the opposite femur we will be able to rotate the flexed leg though quite a large segment of a circle. Suppose we place the axis of this circle back upon the dorsum of the ilium above the acetabulum. It would first be impossible to cross the legs, either at the knees or placing the ankle of the injured by upon the opposite knee, much less to flex it after crossing them. Thus it will be the same with any other displacement of the head of the humerus. This is not the case with a fracture of any part of this bone the great difficulty there is that it rotates too freely.

Hoping that I have made this sufficiently lucid to be comprehended, I most respectfully submit this means of diagnosis to the consideration of those capable of better feeling its value than myself.
Lectures on the Theory and Therapeutics of Convulsive Diseases, especially of Epilepsy. By Charles Bland Radcliffe, M. D., Fellow of the College, Physician to the Westminster Hospital, etc.

LECTURE III.—(CONCLUDED FROM APRIL NUMBER.)

III. The Theory of Spasm.—1. In catalepsy, the state is closely akin to that of a corpse. The blood, indeed, is well-nigh stagnant in the vessels; and it may be necessary to apply the ear to the chest to know for a certainty that the heart continues to beat.

In tetanus there is no fever. All observers are agreed upon this point. It is found also, that the spasms are apt to become more general and more violent as the pulse weakens and the animal heat departs. The bouts of spasm, moreover, are distinctly coincident with paroxysms of difficulty of breathing; and in this way the spasm would seem to be connected, not with excitement of the circulation, but with a state in which the aeration of the blood is considerably interfered with. And, in the tetanus caused by strychnia, there is certainly nothing like vascular excitement; indeed, as we have already seen, the experiments of Dr. Harley afford conclusive proof that the addition of a very minute quantity of the poison to the blood might be considered as equivalent to a loss of two-thirds of the whole amount of blood, inasmuch as it diminished by two-thirds the power which the blood has of absorbing oxygen, and so becoming arterial.

During the spasms of cholera, the skin is frigid, clammy, and blue, the breath cold, the pulse well-nigh imperceptible; and that the coincidence of this state of collapse with the spasm is more than accidental, would seem to be evident from the fact that the spasms relax pari passu with the reaction of recovery.

In hydrophobia, the state of the circulation is the very opposite of fever, as is proved by the cold hands and feet, the perspiring skin, the quick and feeble pulse, the sobbing and sighing respiration, as well as by the fact that the agitation, spasm, and convulsion increase in violence as the circulation fails. It would seem also, that this very depression of circulation must be connected with the agitation, spasm, and convulsion; for, on looking over the histories of a large number of cases, I find that there was less agitation, less spasm, less convulsion where the circulation was less depressed than usual.

In spasmodic ergotism, so far as we know, the pulse presents no sign of excitement throughout the whole course of the malady.
In the "early rigidity" of cerebral paralysis, there may be at first no very evident alteration in the circulation, and the heat may not fall below the normal standard; but before long, both pulse and heat fail in the paralysed parts. In "late rigidity," the local circulation is always feeble, and the heat in the part is kept up with difficulty.

In acute spinal meningitis there may be symptoms of active fever at the onset, but, if so, these symptoms very shortly lapse into those belonging to the typhoid condition. Usually, however, the symptoms have a typhoid aspect from the beginning, and the respiration is too labored and imperfect to allow of a different state of things. In acute myelitis, the circulation is utterly without power; and, as a collateral evidence of this fact, there is a marked disposition to slough in all the parts subjected to pressure. In chronic spinal meningitis, and in chronic myelitis, the state is one of hectic exhaustion.

In the different forms of minor spasm there is, for the most part, no evidence of over-action in the circulation; nor is it otherwise when the phenomena of fever are mixed up with the spasm, as in whooping-cough. For what is the fact? The fact is that the whoop, which is the audible sign of the spasm, does not make its appearance until the febrile or catarrhal stage has passed off; that it disappears if pneumonia, bronchitis, or any other inflammation be developed in the course of the malady; and that it returns again when the inflammation has departed. In this case also, as in laryngismus stridulus, the way in which the spasm is mixed up with the phenomena of partial suffocation is an argument that the blood is imperfectly arterialized during the spasm.

2. In the more severe forms of the disorders which are characterized by spasm, the mental state is indicative of exhaustion, prostration, or inaction. In catalepsy, the mind is in a deep sleep, or else lost in some dreamy vision. In tetanus, the patient is alarmed, absorbed in his sufferings, agitated. The cramps of cholera are attended by indifference to the future and utter hopelessness, than which there can be no surer sign of utter mental prostration. In hydrophobia, everything denotes the want of mental energy, for the state is an exaggeration of delirium tremens. In ergotism, the mental state borders closely upon fatuity. In both forms of the rigidity of cerebral paralysis, early as well as late, the brain has been seriously damaged by white softening, by apoplectic effusion, by red-softening, or in some other way, and the mental power has suffered accordingly. Nor is the case different in other forms of spasm.
The state of mind, indeed, is what it might be expected to be from the depressed state of the circulation; and the depressed state of the circulation (to use once more the argument used on so many previous occasions) is one which necessitates, as it would seem, a corresponding state of inaction, not only in the brain, but in the medulla oblongata, the spinal cord, and in all other parts of the nervous system. Nor do there appear to be any objections to this view in the background.

The traces of inflammation which are occasionally met with in the brain or spinal cord of persons dying of tetanus need be no such objection. It is evident that inflammation of these organs or their coverings is not an essential condition of the disease, for in the majority of cases—as in those occurring in Guy’s Hospital since 1825—there was not the slightest trace of such a lesion. Nay, it may even be said that the inflammation, where present, had served to mitigate or antagonize the tetanic contractions; for it is certain that these contractions may be developed in their most violent and perfect form where inflammation is most unequivocally absent, and that the contractions may be absent where (as in many cases of inflammation of the cord or its membranes resulting from accident) inflammation is most unequivocally present.

In hydrophobia, also, as in tetanus, the cases in which traces of cerebro-spinal inflammation are not found after death are, to say the least, quite as numerous as the cases in which they are found; and hence it is equally impossible to suppose that such inflammation is essential to the malady. It must be understood, also, that the traces of inflammation in hydrophobia are met with almost anywhere and everywhere; and thus it may be conjectured, with no small share of reason, that the inflammation in this malady is in reality a depurative process by which the system strives to rid itself of the virus, and that traces of inflammation are not usually found because death has happened before there had been time for the development of them. This vagueness in the seat of the traces of inflammation is well seen in a careful analysis of forty-six cases of hydrophobia by my brother, Mr. Radcliffe, of Guildford-street.

And certainly it is not easy to suppose that inflammation of the spinal cord or its membranes is necessarily concerned in the production of spasm. On the contrary, it may be held that the inflammation has antagonized or mitigated the spasm. For if violent and general tetanic symptoms may be developed in cases where the spinal cord is altogether untouched by in-
flammation, as in many cases of tetanus; and if, as is certainly the case, the tetanic symptoms are comparatively slight and confined to the back and neck, where the spinal cord is actually and unmistakably inflamed, is it not fair to suppose that the inflammation has had the effect of antagonizing or mitigating the spasm?

As in the different varieties of tremor and convulsion, therefore, so in the different varieties of spasm, the facts would seem to be altogether at variance with the idea that the muscles are provoked to excessive contraction by excessive stimulation of any kind. The facts, it would seem, are at complete variance with this idea, and in as complete harmony with that theory of muscular motion which was propounded in the first lecture. It would seem, in short, that the key to the pathology is supplied by the physiology, and that the physiology is confirmed and established by the pathology. It is the same story throughout.

II.—The Therapeutics of Convulsive Diseases.—Arguing from the physiological and pathological premises, it may be inferred that the fact of tremor, or convulsion, or spasm, can, in no single instance, be urged as a plea for the adoption of "lowering measures." It may be inferred, indeed, that the great desideratum in every convulsive affection is a more vigorous circulation and a purer blood, and that the remedies to be sought after will be those which bring about these changes.

1. I know of no facts which show that a low diet is beneficial in epilepsy. On the contrary, I know of many instances where the patient has been undoubtedly benefitted by the abandonment of such a diet. The meals, of course, must always be regulated so as to guard the stomach from an overload of food; but of the two evils, abstinence is more to be dreaded than repletion. It would seem, indeed, as if the stomach of a confirmed epileptic can never be allowed to remain entirely empty, without some risk of an attack. As a rule, also, stimulants, of one kind or another, would seem to be very serviceable. In some cases, it is true, malt liquors may be objectionable; but in these cases it will generally be found that unquestionable good will result from a proper allowance of sherry, weak brandy-and-water, or, better still, of claret. Indeed, I am satisfied that epileptics, and nervous patients generally, will have good reason to overlook the shortcomings of the recent treaty by which, at reasonable rates, they will be able to substitute the light wines of France for the fiery wines of Spain and Portugal, and the strong ales of our own breweries. Coffee, also, would seem to be a more suitable
beverage than its less stimulating companion, tea, particularly at an early period of the day.

It is, no doubt, of extreme importance to prevent the accumulation of effete matters in the bowels, and to remove such accumulation when it has taken place; but whether purgatives are the proper remedies is not quite so certain. If the bowels do not act with sufficient regularity, there is, in all probability, some error in the diet—some excess of animal food, some deficiency of culinary vegetables and fruit; and the first thing to be done is, obviously, to correct this error. And this is often all that is wanted, if care be taken to explain to the patient that his bowels can act without purgatives, and that he need not—particularly if advanced or advancing in life—be altogether cast down if now and then they do not act every day. Indeed, if the diet be properly regulated, and this explanation made, the patient will generally have the satisfaction of finding his tongue clean, when he remembers to look at it, and of forgetting his stomach and bowels altogether.

Or if the result be not quite so satisfactory, an occasional injection of cold water or brine, on getting up in the morning, will rarely fail to set matters right, and that without disturbing the digestion in any way, or producing disagreeable feelings of depression or irritability.

As to the rest, it appears to be advisable to order the habits in such a way as to save the strength as much as possible. Proper exercise is, of course, necessary; gymnastic exercise, by which the chest is expanded, and the respiratory capacity increased, are valuable adjuvants; but it is no less certain that muscular exertion upon or beyond the verge of fatigue must be looked upon as a common cause of the epileptic attack. As a rule, also, it would seem that epileptics require more than the average amount of sleep, to enable them to recover from the multifarious fatigues of the day and night.

The more strictly medical part of the treatment of epilepsy is a subject of no small difficulty. The treatment of the present day is very different from what it was when almost all disorders were referred to inflammation or over-action of one kind or other. Practically the lancet is now abandoned, and leeches are in a fair way of being left undisturbed in their swampy homes; practically, also, it has ceased to be the habit to distress the stomach and bowels by the frequent use of strong purgatives or emetics; and this change may be appealed to as an argument that "lowering measures" had disappointed the hopes of those who had tried them so long and so patiently, and who gave them up so unwillingly. Be this as it
may, a great change has come over the treatment of epilepsy, and the remedies at present most in vogue in this country are certain preparations of zinc, copper and silver, particularly the oxide of zinc, and the ammonio-sulphate of copper.

The present fancy for oxide of zinc has been caught from M. Herpin, who has devoted a substantial volume to the purpose of showing that many cases of epilepsy may be cured by the vigorous and persevering use of this remedy. In this work, M. Herpin relates thirty-eight cases of epilepsy or epileptiform disease, in nearly all of which he gave the oxide of zinc; but, as I have elsewhere shown, the favorable opinion of this physician as to the virtue of this medicine is by no means borne out by an analysis of those cases. It would appear, moreover, that M. Herpin himself has become less confident than he was in 1852, when he wrote the work in question, for a more recent statement is, "que l'oxyde de zinc, ne cessant point d'être convenable pour les enfants et les vieillards, choue tres souvent chez les adultes." M. Delasiauve, who quotes these words, tells us that one reason for this change of opinion was the absolute failure of an experiment in the Bicetre, in which one of the physicians of the establishment, M. Moreau, treated eleven adult epileptics in every particular after M. Herpin's method. M. Delasiauve also tells us that M. Herpin now gives the preference to the ammonio-sulphate of copper in the treatment of adults. I might argue, also, that his faith is even shaken in this remedy, for I have recently had more than one patient, who had previously been under him, in whose case he abandoned the copper after a very short trial, and trusted to a vegetable simple, of which I shall have to speak presently. Nor can I speak favorably as to the results of the trials, nine in number, in which I gave oxide of zinc after M. Herpin's method; and my experience in this respect agrees fully with that of my friend and colleague Dr. Marcet, who, more perhaps than any other man in this country, has put this mode of treatment to the test of experience.

At the same time, it does not follow that zinc is of no value in epilepsy. On the contrary, the probability is, that it is a remedy of considerable value in the proper case and in moderate dose; and this opinion is not a little supported by the beneficial results which Dr. Marcet has recently found to attend its use in many forms of nervous excitability. Of the other preparations of zinc it is not necessary to speak, for there is every reason to believe that their action for good or evil is analogous to that of the oxide.

It is not easy to obtain any sound evidence of the value of
the ammonio-sulphate of copper in epilepsy. Speaking of the cases recorded in his published work, M. Herpin says that, including relapses, he obtained fourteen cures in eighteen patients; but when these cures are fairly analyzed, they do not turn out to be a whit more satisfactory than those which he ascribes to the oxide of zinc. Nor do I know of anything thoroughly satisfactory in the experience of others. For myself I ought scarcely, perhaps, to express an opinion, for I have never given the medicine a fair trial; but I have met with several patients who have taken it, under the advice of other physicians, and of these I have no hesitation in saying, that not a few, on being asked how they were affected, have said that they felt more nervous while taking it, and that no beneficial change was produced in the fits.

With respect to nitrate of silver little need be said. I have had three patients under my care whose skin, before they saw me, had been tinged of a dismal grey color, and whose fits had been worse, rather than better, during the time they were taking the silver; and many cases are on record which show that this evil may happen without any countervailing good.

"Of all the metallic remedies," says Dr. Watson, "I should prefer some preparation of zinc or iron;" and I believe there are signs of change of opinion in the minds of many thoughtful men, and that before long iron may be placed before zinc, and not after it. If, as has been said, the inferences from the premises is that the desideratum in epilepsy is a more vigorous circulation and a purer blood, it is to be expected that iron may not unfrequently be wanted; and this expectation is not belied by my own experience. At the same time I must confess that there are many cases in which this remedy fails to bring about any beneficial result, and where harm rather than good may be said to attend its use.

In many cases, also, another common remedy, which is not mentioned in Dr. Watson's chapter on epilepsy, and which is also overlooked by almost every other author, would seem to do good. This is quinine. But with this remedy, as with iron, it must also be confessed that there are other cases in which, to say the least, the good done is not unequivocal.

In a word, it is exceedingly difficult, in the present state of our knowledge, to decide as to the value of these remedies in epilepsy; but that zinc is no specific, and that the common tonics mentioned are not of themselves sufficient, must, I doubt not, be the confession of every one who has had sufficient experience in the matter.

Where, then, must we turn for what is wanting? Is it to
remedies of a directly stimulating character? Is it to remedies which may be supposed to purify the blood from certain matters which ought to be excreted, but which being retained produce a depressed or oppressed state of the circulation?

"If," says Dr. Watson, "I were called upon to name any single drug from which, in ordinary cases of epilepsy, I should most hope for relief, I should say it was the oil of turpentine. And I find that other physicians have come to the same conclusion. Dr. Latham, the elder, was, I believe, the first person who made known its efficacy in this disorder. Foville states that he has seen excellent effects from it. It is highly spoken of by Dr. Perceval in the 'Dublin Hospital Reports.' It is not given in large doses, but in smaller ones frequently repeated; from half a drachm every six hours." And that turpentine is a valuable remedy in epilepsy, very valuable, I have no doubt whatever.

Another remedy which puts in its claim for approval is valerian. This is a very favorite remedy, both in this country and elsewhere, and its claims, though not equal to those of turpentine, appear to be in every way deserving of attention. Recommended by Aretæus and Dioscorides, and in use ever since, it was never other than a favorite remedy. Now the prominent action of valerian is that of a stimulant—an action depending upon the presence of a composite volatile oil, of which one portion is a volatile acid, capable of forming a salt with bases, and known under the name of valerianic acid; and it is a natural question, after what we know of turpentine, whether the stimulating action of the drug does not show that it may be efficacious, and explain the secret of its efficacy.

It is somewhat significant also, that the selinium palustre is one of the four principal remedies to which M. Herpin has pinned his faith; and not only so, but the one to which he gives precedence. These four remedies, ranked in the position belonging to them in an ordre de merite, are—selenium palustre, ammonio-sulphate of copper, oxide of zinc, and valerian. Now, selinium palustre is an unbelliferous plant, of which several grammes may be taken at once; and, on questioning three or four patients who have taken it, the answer was that they were warmed and comforted by it. In other words, its action would seem to be that of a feeble stimulant.

Under these circumstances, therefore—believing that a more active state of the circulation is a desideratum in epilepsy, and having these practical arguments in favor of turpentine and valerian—a sufficiently natural question was whether cam-
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But 

May, 1853, I read the lessons of my own experience, and the answer different from what might be expected.

That camphor is often a very valuable remedy in epilepsy, I have no doubt in my own mind. In doses of about three grains, twice or thrice a day, for a time, I have seen such results as to justify me in ascribing to camphor all the virtues belonging to turpentine, with this addition in its favor—that it is not unpleasant to the taste, and that it exercises, or seems to exercise, a directly quieting influence over the generative and urinary organs.

Naphtha also would seem to have the advantages without the disadvantages, of turpentine. In doses of from half a drachm to a drachm, and taken for some time, I have often had what seemed to me unequivocal evidence of its beneficial action. As a rule, also, a patient soon becomes indifferent to the taste, particularly if it has been redistilled more than once.

Of the stimulant gum-resin, my experience is not very ample; but I think I have seen enough to satisfy myself that, in several cases, they are of considerable value. Of musk and castor I have no experience.

With respect to the different forms of ether, Hoffman’s anodyne, chloric ether, spirits of nitric ether, and so on, there can, I think, be no doubt as to their great value as occasional remedies; and the same may be said of ammonia. In the majority of instances, it is only to this class of remedies we can trust for warding off a fit. In some cases, also, ammonia would seem to be of much use as an alkali in a point of view of which we have now to speak. But however beneficial stimulants may be, it is necessary to confess that they will not do all that is wanted. It would appear, indeed, as if something were wanted which will carry out the second indication, and ensure—what has been spoken of as—a purer condition of the blood. Nor are we here altogether in the dark.

“About fourteen months ago,” wrote Sir Charles Locock in 1853, “I was applied to by the parents of a lady who had had hysterical epilepsy for nine years, and had tried all the remedies that could be thought of by various medical men (myself amongst the number) without effect. This patient began to take bromide of potassium last March twelvemonth, having just passed one of her menstrual periods, in which she had two attacks. She took ten grains three times a day for three months; then the same dose for a fortnight previous to
each menstrual period; and for the last three or four months she has taken them for only a week before menstruation. The result has been that she has not had an attack during the whole of the period. I have also tried the remedy in fourteen or fifteen cases, and it has only failed in one, and in that one the patient had fits not only at the times of menstruation, but also in the intervals."

In using bromide of potassium in these cases, Sir Charles Locock's object was to calm an erotic disposition, which attended and aggravated the epileptic symptoms, and this end may have been, and in all probability was, answered. But this is certainly not the only way in which this remedy acts beneficially. On the contrary, after trying it in scores of cases during the last two years, I can testify that bromide of potassium is a very valuable remedy in cases where there is not the slightest sign of an erotic disposition. I can testify, indeed, that this remedy has proved more or less serviceable in cases the most dissimilar in character—so serviceable that the name of Sir Charles Locock ought always to be remembered with gratitude by every epileptic, and by many suffering from other kinds of convulsive disorder. How to explain the modus operandi of this medicine is no very easy matter; but I am inclined to think that this in part at least, is by an alternate action upon the blood analogous to that produced by iodide of potassium and common salt—an action by which, possibly, the blood may be kept free from compounds analogous to uric acid. And this I do, because for a long time, I have found decided benefit from occasional doses of a mixture containing bicarbonate of potass and iodide of potass, with or without a drop or two of tincture of colchicum or wine of white hellebore. At any rate, the alkaline character of the compound would seem to be necessary in some cases; for on looking over about thirty cases in which I tried bromide of iron, as well as bromide of potassium, I find that in the majority the latter preparation had a more beneficial action than the former.

At any rate there can be no doubt that a healthy action of the kidney, and of every organ by which the blood is kept in a state of purity, is essential to the successful treatment of epilepsy.

But, it may be asked, what is to be said of the thousand specifics which have been recommended from time to time? What, amongst others of strychnia, belladonna, conium, cotel-ledon, umbilicus, poudre de Neuchatel, tracheotomy and cauterizations?
Strychnia, as all know, was a favorite remedy with the late Dr. Marshall Hall; but the dose was attenuated to such a degree as to render it somewhat difficult to believe that much good came of it. Dr. Hall, indeed, distinctly allowed that harm is done if the dose be sufficient to produce the physiological effects of the drug.

Belladonna—a remedy recommended by Stoerk, and used some years afterwards by M.M. Debreyne and Bretonneau—has been again brought into notice by M. Trousseau, who says he has employed this remedy for twelve years, and always had under treatment from eight to ten patients. He says, further, that of 150 persons so treated, 20 have been cured, or, at any rate, that their fits have not returned; and that Mr. Blacke, who employed it during the same period in a large private practice, has met with a like proportion of successes and failures. It is a fair question, however, whether 13 per cent. of successes (which may, possibly, in part at least, be explained in a different way) can be regarded as sufficiently conclusive evidence in favor of the remedy; and this the more, as other practitioners, M. Delasiauwe among the number, have been less successful. Judging from my own experience, my impression would be that belladonna is of very doubtful value. Nor is a more favorable conclusion to be drawn respecting conium. I have tried this remedy in several cases, in small and also in full doses; but the result was no more satisfactory than that which had been already arrived at by Professor Schroeder Van der Kolk.

With regard to cotyledon umbilicus, it is not very easy to believe in any powers beyond those which may be derived from the imagination acting upon a new and innocent medicine. It is very possible, also, that some part of the benefit, where there has been any benefit, may be ascribed to the leaving off of some less innocent drug.

Poudre de Neuchatel is a remedy which has some credit in Switzerland, and which has lately been brought prominently under our notice by having been given in some of the cases recorded by M. Herpin. And what is this remedy? It is none other than the powder of taupe grille—in plain English, fried mole. It is, indeed, a relic of the days when animal remains, of a more objectionable character, fried or otherwise, were offered to the unhappy epileptic. In justice to Mr. Herpin, however, it must be said that he does not believe in this out-of-the-way remedy. He only tries it when other remedies have failed.

And certainly it must be allowed that tracheotomy does not
realize all the original hopes of Dr. Marshall Hall. It does not always, perhaps usually, make the convulsion slighter. It does not prevent danger, for (as I have shown elsewhere) of the few patients upon whom the operation was performed, three have died either in the fit, or in connection with the fit, and of the three the opening was free from all obstruction, at least in one. The first two cases, indeed, were calculated to damp the hopes of any one less sanguine than Dr. Marshall Hall. In the first case, the patient was a boatman, aged twenty-four, epileptic for seven or eight years, and whose fits were frequent and severe. The operation was performed by the late Mr. Cane, of Uxbridge, during a fit of "asphyxial coma," which had lasted nineteen hours. The relief was immediate, and for some months afterwards the fits were absent; but unfortunately for the credit of the operation, the patient, not liking the gurgling noise and the muteness consequent upon the unnatural opening in his windpipe, had chosen to wear the tube with its opening carefully corked up. This information I had from Mr. Cane himself. Very soon afterwards the man was lost sight of, having been discharged from his situation for drunkenness. In the second case, that of a woman, aged thirty-six, death happened in a fit about twenty months after the operation, and it is certain that the tube was open at the time. It is certain, also, that the fits continued after the operation, possibly a little less frequently and severely, but decidedly of the same.

As to the value of cauterizing the larynx, it is less easy to come to a conclusion. Dr. Brown-Sequard says that a third of his epileptic guinea-pigs were cured by this mode of treatment, and that all the rest, with the exception of two or three, were relieved; and he suggests a similar mode of treatment in epilepsy. A little later, Dr. Eben Watson, of Glasgow, recommended a similar mode of treatment, and relates three cases—two by himself, and one by Dr. Horace Green, of New York—in which the treatment appears to have been carried out with benefit. Dr. Brown-Sequard also lays stress upon cauterization in other parts, as in the nape of the neck, and especially in the neighborhood in which the aura originates, and he prefers the moxa or hot iron to milder measures. This practice, he tells us, proved very successful in his epileptic guinea-pigs. In a word, Dr. Brown-Sequard furnishes us with some additional facts in favor of counter-irritants as a means of cure in epilepsy; and not only so, but he gives a hint which may prove to be of some practical value, in pointing out the larynx, and the locality in which the aura originates, as sites
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in which "counter-irritation" may be especially serviceable. Now, the verdict of past experience is very much in favor of counter irritants, and I can well believe that this verdict is true—true because the inflammation caused by the counter-irritant may for the time rouse the sluggish circulation of the epileptic towards a pitch of safety, and because the discharge may tend to rid the blood of some impurity; but my own experience in this matter is too limited to enable me to arrive at a sound conclusion.

With regard to the treatment of the epileptic fit little need be said. As a rule, it will be only necessary to take care that the patient does not injure himself; that the head is not allowed to hang too low; and that any necklace or neckerchief be loosened. If salt be at hand, a spoonful may be put into the mouth; if water be within reach, a little may be sprinkled upon the face, though the advantages of such a practice are scarcely sufficient to compensate for disadvantages and risks arising from wetted garments. In ordinary epilepsy, it can scarcely ever be necessary to have recourse to chloroform, as it may be in some prolonged epileptiform affections; but if the convulsive stage is unusually prolonged, no remedy would seem to be more appropriate and effectual.

In concluding these brief remarks upon the therapeutics of epilepsy, we may say with Marshall Hall—"There is no royal road to the cure of epilepsy. The idea of a remedy for the disease is unphilosophical; and the treatment should consist in a well-advised plan, embracing every means of good, and avoiding every means of harm."

2. A single word must serve for what has to be said upon the therapeutics of other convulsive diseases. Where these diseases are of a chronic character, whether the convulsive symptom be tremor, convulsion, or spasm, it matters not which, there appears no reason for adopting an opposite plan of treatment to that which has appeared to be necessary in ordinary epilepsy. Nor does the case appear to be different where the convulsive symptom is associated with disease of an acute character. Inflammation, in itself, is no longer regarded as a sound argument for the adoption of lowering measures; and if inflammation in itself does not call for these measures, it certainly does not follow that a louder call is made by the occurrence of tremor, or convulsion, or spasm, before or after the inflammation. On the contrary, the natural inference from the premises is, that the convulsive movement might often have been prevented by more carefully husbanding the strength of the patient. According to the premises, indeed,
he presence of tremor, convulsion, or spasm, would be a reason for transfusing blood, rather than for abstracting blood, except, perhaps, in one single case, and there is where, from the mutual prolongation and severity of the asphyxia in a first attack, there is danger of haemorrhage into the brain and lungs. And certainly there is no practical objection to this view, for all must know that we have no reason to be satisfied with the results of a lowering plan of treatment in acute convulsive disorders.

On the Treatment of Rattlesnake Bites, with Experimental Criticisms upon the various remedies now in use. By S. Wier Mitchell, M. D.

The subject of the poisons made use of by certain animals has been in all times of the utmost interest to the popular mind. That it has failed to attract an equal or proportion- al amount of scientific investigation, can only be accounted for by supposing that the popular aversion to serpents, as well as the real danger which more or less surrounds the pursuit, have combined to deter toxicologists from engaging in such researches. The admirable effort in this direction made by the Abbe Fontana, who has left us the record of 3090 experiments on viper poisoning, may also have done something to prevent further study of this serpent, since his opinions have been reverentially received as final and the multitude of his experiments has caused them to be looked upon as exhaustive of the subject.

In other than European countries, and where the more virulent poisonous snakes abound, observers have been wanting, or they have lacked those means of pursuing the study which only a great city affords. It has thus happened that through want of material where observers were plenty, or lack of these where material was abundant, the knowledge of serpent venoms has advanced but little since the days of Fontana.

Before the time of that great toxicologist, viper venom had been studied by Charas, 1669, Redi, 1672 and 1675, and Mead, 1673. A multitude of others had also touched the subject, but on the whole, they added nothing important to the information which came down from the Greek and Roman fathers of medicine; or, when they added anything, it took the shape of fanciful conjecture, and served only to make more difficult the task of unraveling the united
web and woof of popular and scientific beliefs as to venomous serpents.

Without carefully reviewing this mass of strange opinions and superstitious conceptions, it is not possible to appreciate the services done by Fontana in clearing the ground for modern research and in setting at rest a host of minor absurdities. Most of the definite and novel views which he put forth as the direct results of his experiments have been more or less unsettled by various partial inquiries of more modern date; but, on the other hand, some of the most valuable facts which he discovered have never been questioned; and, as a whole, his essay, or series of essays, is still a monument of industry, ingeniously directed, and of experimental sagacity of the highest order.

From 1767, the date of his essays, no contributions of any moment were made to the toxicology of venoms until the publication of Russel on the Poisonous Serpents of India, in 1787.

In 1793 and 1799 appeared in this country Dr. Barton's Essays, which were rather records of his own thoughts and of popular and other opinions than of original research. In 1817, Mangili settled the question of the innocency of venom taken by the mouth; and 1843, Prince Lucien Bonaparte analyzed the venom of the viper, and determined its albuminous nature. At various periods also appeared numerous papers by East Indian surgeons and European physicians on the therapeutics of snake bites; but with trifling exceptions, no further experimental papers were produced until Drs. Brainard and Green recorded their researches in 1853. Dr. Brainard's separate Essay, 1854, contained interesting observations as to the phenomena of venom poisoning, but the main object of both the papers alluded to was the examination of the value of iodine used locally as an antidote. The tendency to regard the subject chiefly from a therapeutical point of view has indeed prevailed throughout nearly all of the researches, made either in this country, in India, or in Europe, so that if we omit the essays of Bonaparte, Mangili, Russel, and Davy, the work of Fontana still remains without a companion—no one since his time having examined any one serpent poison as to its chemistry, toxicology, and mode of formation. Yet, as every physician must concede, the treatment of snake bites can never be rationally understood until we retrace our steps and study anew and more profound the venom malady and its cause.
in place of playing at perilous hap-hazard with its difficult therapeutics.

When I first engaged in the study of the venom of the rattlesnake, it was with the intention of ascertaining what value Bibron's antidote possessed. To effect this single end I procured four or five snakes from the Pennsylvania Alleghanies and proceeded to subject animals to their fangs, and afterwards to give the supposed antidote.*

After destroying many animals and attaining only negative results, I began to perceive that I was working in the dark, and that it was altogether impossible to obtain useful results without possessing definite knowledge as to the nature of the venom, the mode of its formation and ejection, and the whole natural history of the disease to which it gave rise.

The information which I desired was yet to be created. It existed in none of the books, and even so much of it as had been acquired by Fontana with regard to the viper, might not be true of the rattlesnake.

With a clear sense of these deficiencies in the present state of knowledge as to venom poisoning, I laid aside my experiments on remedies, only to resume them after the labors of two summers had removed from my path the impediments which have hitherto rendered the study of antidotes practically useless. The result of these researches is recorded at length in a paper recently published by the Smithsonian Institution, and to which I desire to refer the reader for full details of my experiments, and for the conclusions to which they led me.* The principal difficulty which I encountered at the outset was the want of snakes; owing, however, to the ready and constant aid which I received from the Smithsonian Institution, I was enabled to secure a regular supply from the Virginia Alleghanies, and with these and such other chance supplies as I could purchase, or as were procured for me through the kindness of my friends, I was enabled to pursue my purpose with only such embarrassments as of necessity belong to the subject.

The practical difficulties which lay in the way of one

studying the treatment of snake bites were among the most easily resolved of the many questions which multiplied in number and increased in perplexity as I advanced on this interesting path of study. In fact, I cannot but perceive that I have re-opened a field of research which promises most valuable and strange results to the toxicologist, nor can I fail to comprehend that the whole subject of venom poisoning is to be reconstructed, and that on no branch of science are we so utterly ignorant as on this one. M. Bernard alone, of all the recent writers, seems to be aware of our lack of knowledge in this direction, and strongly urges a re-examination of the principal animal poisons, such as the venom of toads† and serpents.

At the close of the Smithsonian Essay, just referred to, I have given a brief statement of my views as to antidotes, and as to the great difficulties attendant upon their thorough study, and I have appended a short discussion of the relative value of various remedial means now in repute for the treatment of snake bites, as well as my own opinion on the rational method of treating these injuries.

The object of this present essay is to consider all the best known antidotes by the light of the practical criticism of experiment, and, finally, to point out what means of treatment appear to be best calculated to relieve the sufferers from these dreaded accidents.

The course of study thus laid down will involve an examination of the following points, which I shall consider at such length as my space permits:

1. Fallacies in regard to the use of antidotes of all kinds, arising from want of exact knowledge as to the secretion of venom, and the mode in which the serpent uses its fangs and ejects the poison.

2. Fallacies as to antidotes, arising from want of information on the natural history of the disease caused by the venom.

3. General considerations as to antidotes, and as to the mode of conducting researches in this direction so as to avoid errors.

†Medical Times and Gazette, Sept. 29th, 1860, p. 296. M. Bernard makes some interesting remarks on the venom of the toad. M. Gratiolet had already examined this subject and arrived at somewhat similar conclusions, to which, however, M. Bernard does not allude. See Gratiolet. Comptes Rendus, vol. xxxiv. p. 732, 1851.
4. Description of the phenomena of rattlesnake bites, analysis of symptoms, etc.
5. Local treatment. Experimental examination of the local medication most in repute.
6. General or constitutional treatment. Experimental examination of the principal constitutional remedies.
7. Sketch of the author's views as to treatment, local and general.

1. Fallacies in regard to the use of antidotes of all kinds, arising from want of exact knowledge as to the secretion of venom, and the mode in which the serpent uses its fangs and ejects the poison. When antidote has been given, or any treatment used after a snake has bitten a man or a lower animal, it is usually taken for granted that the danger of any two bites is much the same if the subjects of the bites are alike in age or vigor. Now, even when the serpents are themselves of equal bulk and have at disposal drop for drop the same amount of venom, it may chance, that the danger of the two bites is utterly unequal, and thus that in one an antidote might fail, and in the other appear to succeed. This arises from one of the following reasons:

The snake fails to elevate its fangs sufficiently when striking, and the fang points touching the skin are driven backward toward their usual position of repose without penetrating the part aimed at. When this accident occurs no wound is inflicted unless the teeth of the lower jaw become entangled in the skin of the bitten part, in which case the small wounds thus made may be easily mistaken for fang marks. When experimenting with Bibron's antidote, in July, 1859, a large dog was secured and placed within reach of a snake which struck it fiercely and became fastened for a short time, so that I was able to perceive that the fangs were doubled backward, their anterior convexities resting against the skin to which the serpent was attached by the curved teeth of its lower jaw. The wounds made by these teeth were of course harmless and the dog experienced no further inconvenience. This cause of failure in the bite must be difficult of detection, under ordinary circumstances the snake being free, since it would be dangerous to approach closely, and since the snake is usually entangled for but a brief period. When, however, the serpents are held by the middle, in a leathern loop at the end of a stiff, and thus allowed to bite, they not unfrequently fail to elevate the fangs sufficiently, and, as in experiments on antidotes,
it is often necessary to secure the serpents in the manner described, the possibility of this occurrence should not be overlooked.

When the rattlesnake bites, whether it be at perfect freedom or not, both fangs do not always pierce the skin of the animal stricken. I have sometimes suspected that the serpent does not always elevate both fangs. This, however, is a point which does not readily admit of direct observation in snakes at liberty, and can only add, that of seven dogs bitten by serpents at freedom, four had two fang marks, and three had but one. Now, as the fang, duct, and gland of one side are quite distinct from those of the other, if only one fang be used, the dose of poison administered will be but one-half of that which would be injected were both fangs employed.

Apart from the possibility of the snake using only one fang at will, there are other facts in this connection which may enable us to explain the frequent occurrence of single fang marks. When, for example, the snake strikes obliquely at the flank of an animal, one fang sometimes remains out of reach of the part penetrated by the other, and this is the more apt to occur, because, in elevating the fang teeth, at the moment of attack, their extremities are made to diverge widely.* For a like reason, when the serpent strikes a small limb or member, it sometimes chances that the fangs either straddle the part completely, or that entering it, the other passes it to one side without in any way injuring its tissues.

Besides these cases of fang marks, many instances occur in which, although both fangs penetrate the opposing tissues, only one is in reality active, or, both entering the flesh for reasons to be presently detailed a part, or perhaps in some cases the whole of the venom fails to be injected, and the danger of the wound is materially lessened.

When the fangs in biting are fixed in the flesh, the lower jaw of the serpent is pressed upward against the part bitten and at the same instant the temporal muscles, and especially the anterior temporal, compress the venom gland, and

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*The object of this seems to be to protect the lower jaw from injury in case the fangs miss their aim and are driven downward, in which cases they would pierce the lower lip of the snake were it not that their divergence throws their points outside of it.
urge its accumulated venom along the duct and through the tooth. In most cases where both fangs have been used, the actions which bury the fangs more deeply, and inject the poison, are consentaneous on both sides; but sometimes a perceptible interval appears between the contraction of the right and left sets of muscles, so that a sudden motion of the bitten animal occasionally liberates one fang before its charge of venom has been duly delivered.

Still more curious, however, is it, that we may have both fangs deeply buried in the flesh of an animal, and yet not a drop of venom injected. The explanation of this source of fallacy in the use of remedial means is to be found in the following facts. Redi, in his researches on viper venom, published in 1675, states that the poison passes down alongside of the fang, and between it and the mucous cloak which covers it when at rest, and which is now known as the vagina dentis. Fontana disproved this statement, showing that the venom passes out through the canal of the fang. If, as I presume is the case, the arrangement of which I shall presently speak belongs to the viper as well as the rattlesnake, both were right and both were wrong. Professor Christopher Johnston, of Baltimore, and Professor Jeffries Wyman have both of them recently described the venom duct of the rattlesnake as ending in a papilla, which projects into the basal aperture at the base of the fang. Upon close inspection it can be seen that no tissues connecting these two parts together in any direct manner, the end of the duct being held in close contact with the fang by the gum, which envelopes the tooth, and through which the extremity of the duct passes. When the fang is couched, at rest, in its mucous sheath, the apposition of the fang and duct is still kept up, but is less perfect than when the fang is erect, since then the mucous cloak is thrown off the anterior convexity of the fang, and gathered in firm folds at the base of the tooth, firmly presses the papillary end of the duct into the lower orifice of the fang.

Such being the case, it can be seen that if the fang is not fully erected, or if, from any cause, the end of the duct is separated from the fang opening, a part or the whole of the venom may escape between the fang and its mucous cloak, and fall innocuous on the skin of the bitten animal. In a modified form this result often happens, and a part at least of the poison is cast on the skin, the larger portion traversing the duct, and probably the excess alone being wasted.
In direct experiments on animals I have often noted the escape of venom alongside of the fang, and in general, the more serpent's motions are interfered with during the experiment the more likely is it that the whole or a part of the poison will be lost in the way I have mentioned. It thus happens that the most vigorous serpent may become innocent at the very moment of the bite, and that not even the most watchful attention will enable the observer to say that the remedy given was the cause of a bite proving mild in its effects. As I have here urged, this, like other sources of fallacy, is most apt to appear when the serpent is held, and when thus we endeavor to cause the bite to occur in a particular part of the body of an animal.

2. Fallacies to the value of antidotes, arising from want of information in regard to the natural history of the disease caused by the venom of serpents. There exists an idea, not confided to the popular mind, that the bite of the rattlesnake is an extremely fatal accident. Although we have no full statistics which are available to settle the matter, I have gathered enough information from various sources to enable me to assert with great confidence that it is far less fatal than has been supposed. When making this statement, I do not mean to be understood as saying that the rattlesnake is not a dangerous animal, but only that neither man nor dog need be regarded as condemned to death when wounded by it, whether remedial means are afterward employed or not. A large rattlesnake long restrained from biting will use his weapons no doubt with deadly effect, and hence, when showmen have been bitten, they have rarely escaped. On the other hand, the greater number of such accidents, arising from serpents at freedom, will be apt to prove serious in their results, but not very often fatal. Of fifty-seven cases of rattlesnake bites which are given in full or merely mentioned in the journals, only five died; and even if we make every allowance for the character of the reports, this evidence still remains sufficiently strong; nor have I found that it lost force in the presence of such facts as my experiments on animals have brought before me. A close analysis of the table of cases in my Smithsonian essay, (p. 100,) with reference to the treatment and the result, brings us to the conclusion either that all treatment (oil, alcohol, iodine, ammonia, etc.,) is successful, or else that the greater part of the cases must have survived under any form of medication. It can be
shown, moreover that most of the plans of treatment employed are utterly useless.

Here, then, is a malady from which at least seven-eighths of the patients recover. The mere fact of their surviving can assuredly be no test of the value of a plan of treatment. Yet, that this or that case did not die has been thus construed, and this cardinal error exists in almost all of the earlier examinations of antidotes, and in some of the later ones.

Authors who have reported successful cases of the treatment of snake bites by various means, have been further misled by a want of knowledge as to the duration of cases not treated at all, and as to the character of the recovery. A general survey of a number of cases, and a careful study of animals bitten and not treated, can alone supply this lack of information as to the average natural history of cases undisturbed by any therapeutic resorts. As the result of such study, we learn that a few cases of rattlesnake bite die, that a few linger long ere recovery is complete, and that the larger proportion get well, and that with a degree of suddenness which is sufficiently surprising, considered with reference to the serious character of the symptoms, and well calculated to deceive the credulous therapeutist.

In many cases this abrupt departure of all serious symptoms is most remarkable: a man is bitten, thought to be dying, treated this or that way, and on horseback or at work forty-eight hours from the time of the bite. In dog bitten, alike result obtains and the recovery after the more urgent symptoms is usually rapid and complete.

Now nothing is more gratifying to the physician that the sudden effect of his remedies; and the speedy and favorable change of a case from an appearance of extreme danger to one of relief and convalescence, naturally leads him to attribute that result to his medication, which really was natural to the malady. A fuller acquaintance with the disease must annihilate this source of error for any but the most incautious minds.

3. It will now be fitting to consider the third section of our subject, and to comprehend clearly how we avoid the sources of falacy above pointed out, and how the study of antidotes to serpent poison should be conducted.

And first, what is an antidote? The popular mind usually conceives of it as a remedy having power to neutralize directly in the system a given poison, destroying its potency
by acting upon it chemically or otherwise, in some more mysterious way. It is possible that agents of this kind may exist, but thus far we are ignorant of any possessing such a relation to the venom of the rattlesnake. The pretensions of remedies supposed to be so gifted may be easily settled by mingling them with the venom, and afterward injecting the mixture into the tissues of an animal.

The more rational conception of an antidote, is of an agent which merely counteracts the effects of the poison, and which may have no chemical influence on the poison itself. Such an antidote may enjoy no power to affect the toxic activity of venom when mixed with it, and yet may prove to be an active constitutional preservative against its effects. Just this position seems to be held by one of the supposed antidotes most in repute.

So far as I am aware, no great difficulty is likely to arise in the study of antidotes, owing to their nature as such, for although some of those most in esteem, such as Bibron's antidote (bromine) and the Tanjore pill, (arsenic,) are poisonous in a high degree, it is easy to learn how much may be given with impunity. Hence, although in one or two instances observers have actually and plainly destroyed animals with the very agents which were designed to relieve them, it is not probable that errors of this kind will be perpetuated, or even occur so often as to bring into disrepute any really useful remedy. The mode in which the study of antidotes and local remedies should be conducted, so as to avoid all the fallacies to which I have alluded above, will now claim our attention.

Opportunities of studying the use of remedies, local and general, in connection with cases of venom poisoning in man, are of course more or less rare, and it is scarcely possible to eliminate or allow for the varied fallacies which surround with difficulty this method of studying the subject. Owing to this, and to the comparative ease with which the means of study may be created in animals, it is preferable to employ these, and to use only such treatment in human cases as may appear to promise enough of success to justify its usage.

The larger the animal employed the better will it be for the purpose, since the symptoms are more easily studied in large animals, and since they are less likely to be injured by active antidotes. Almost all toxicologists who have investigated this subject, have been content to submit animals,
as dogs, etc., to be bitten by the serpents themselves. We have seen, however, that when this course is followed, a number of fallacies interfere to prevent the observer from drawing satisfactory conclusions, and although great care and thorough acquaintance with the anatomy and habits of the serpent may enable us to overcome this difficulty in part, some portion of the obstacles in question are in the nature of things unavoidable. In my own researches I have sought to escape from these embarrassments: first, by a careful study of the natural history of venom poisoning in dogs and other animals: second, by injecting into the animal experimented upon known quantities of venom previously removed from the ducts of active serpents. The venom to be thus employed is secured in the following manner:

A serpent is seized by the middle, with a leathern loop at the end of a staff; then the neck is caught and held down on a table with a notched stick, while a tube an inch and a half in diameter, and holding a sponge soaked in chloroform, is slipped over the snake's head, and by a dexterous motion carried downward so as to include one-third of the length of the serpent, the notched stick being at the same time removed. About twenty minutes are required to stupefy the snake. It is then seized by the neck, and the edge of a saucer slipped under the upper jaw, so as to elevate the fangs. This is done by an assistant while the operator with his right thumb and forefinger strips forward the glands and ducts on both sides. The yellow venom runs out through the fang and alongside of this weapon. A known amount of this fluid may then be injected into the tissues of an animal, the instrument employed being a minute trocar and syringe. It may be objected to this method of using the venom, that it is supposed by many persons that the poison is less fatal when used artificially than when injected by the snake. Of this, however, there is no adequate proof, and I have seen nothing to induce me to believe that it is at all correct. On the other hand, the advantages arising from the artificial use of the venom are manifold and obvious, and it is only essential to know what amount of venom is certain to destroy a dog if no remedial agency intervenes. If, in addition to this, the observer is thoroughly cognizant of the ordinary phenomena of the venom disease, he will possess all the reasonable means of insuring accuracy, which are now attainable. Antidotes may then be used internally
in one or two ways to be hereafter illustrated, or mingled with the venom, and injected where this mode of study is to be desired.

Before stating my experiments upon the plans of treatment now or recently in repute, it will be proper to give the reader certain necessary information as to the nature of venom poisoning, the forms it affects, and the symptoms which characterize its varieties. These details must of necessity be brief, and the reader who wishes more complete information is referred to the author's previous paper.

The venom of the rattlesnake is a yellow, albuminous fluid, of an acid reaction of a sp. gr. of 1044, and coagulable at a temperature of 140° to 160°. Its toxic activity is unaffected, or but slightly affected by boiling, and not at all by freezing. Acids and alkalies, alcohol, etc., do not destroy its virulence, and when dried it retains dreaded power for an unlimited period of time. Closer qualitative analysis discovers in it at least two albuminous substances: one coagulable by boiling, either when alone or diluted with water, and also by alcohol; the other, also albuminoid, coagulable by alcohol only, and constituting the active element of venom. This latter agent I have described as crotaline.

Effects of venom on man and animals.—When an animal receives in any way a dose of venom, one of two things happens. If the animal is small, or at all events if relatively to the size of the animal the amount of venom injected is large, the animal dies very suddenly, acutely poisoned. If, on the other hand, the dose of venom is relatively small, the animal suffers to some extent with the symptoms of acute poisoning, and then passes into what I shall term the stage of chronic or secondary poisoning, which may endure for an indefinite period, and end in death or recovery. Acute poisoning in a man is rare,* and is more and more common the smaller the bulk of the animal bitten, until we arrive at cold-blooded creatures, in whom this sudden ending is the exception, and great prolongation of the malady (i.e., secondary or chronic poisoning) the rule. In dogs I

*Though rare, not impossible; men have died from this cause within twenty minutes of the time of the bite, although no such cases are on record in the journals, and are only known to me by personal information.
have rarely seen the very rapid death I speak of; but it is not uncommon where the serpents are large and active and their venom abundant.

Let it be clearly understood then, that when man or animal is poisoned by venom, a set of symptoms occur which wind up with death, or, being prolonged, pass into others of a somewhat different nature, constituting the chronic cases, or those which survive long enough to exhibit the signs which characterize the secondary poisoning.

When, for instance, a pigeon is bitten, or receives in any way three or four drops of venom, it walks a few steps, crouches, grasps for breath, rolls over and is dead in a few minutes, convulsed or not in the moment of agony. So sudden and speedy is this ending in some cases, that the pigeon may die within a minute. The only additional symptoms which we can perceive are the rapidly quickening and enfeebled motions of the heart, and sometimes vomiting and evacuations from the cloaca. In larger animals the same symptoms take place, but the vomiting is more common and the expression of general debility more perceptible.

Men who have been bitten describe their symptoms as much the same in kind, but, as before stated, they rarely end in death in this stage at least; the power of resistance acquired by increased bulk being, I presume, the chief protective agency. In some cases the more formidable signs of prostration do not declare themselves before some minutes or even half an hour has passed. In one case a man engaged in splitting wood was bitten: he picked up a stick and pursued the snake a few feet, when suddenly he became sick at the stomach, complained of deadly nausea and general weakness, reeled a few steps farther, and fell on the ground. In another instance, the sufferer walked briskly for twenty minutes before the symptoms of debility became very well marked.

It becomes important to our purpose to decide the cause of these symptoms and what organs are affected. All authors agree in speaking of the condition as one of debility and all describe the pale face and cold sweat, the hurried breath and quick and feeble pulse. If we examine an animal dying rapidly with these symptoms, we find absolutely no lesions—the blood and the tissues are alike healthy in appearance—both to the naked and assisted eye. A series of experiments, the relation of which would be misplaced
here, has shown that the heart does really become enfeebled and that the arterial pressure is singularly diminished, and this appears to be a direct effect on the arterial system, since it is impossible long to sustain life by artificial respiration; at the same time the nerve centres are attacked, and the respiratory movements failing on this account, become jerking and labored; the sensory and motor nerves seeming still to preserve their functional integrity. Such, in general terms, I suppose to be the causation of death in these cases. Far different are the symptoms which arise for study when the patient survives the stage of acute poisoning. The duration of this stage is indeed difficult to define; this only we know, that after a time the debility continuing, as shown by vomiting and syncope, the blood becomes affected in a marked and singular manner, while the relations of tissue and fluid are so altered that passive hemorrhages take place; jaundice occurs, and a variety of symptoms declare themselves as this or that organ becomes diseased and the seat of congestion and ecchymosis. Meanwhile the local symptoms assume an importance which they do not possess in the acute stage and may even become paramount influence in deciding the fate of the patient.

If then the patient die very early, there are symptoms of weakness alone, and there are no perceptible lesions of blood or tissue; supposing life to be prolonged, the early symptoms continue, while signs of blood poisoning appear in addition, and lesions closely resembling those of yellow fever are found post-mortem. If, again, the patient successfully resists the secondary evils here described, he may still perish from the results of the local injury, which increases in danger and importance as the case progresses.

To make this matter clear, we will now examine more accurately the various symptoms and the character of the wound.

Wound.—The wound is usually described as very painful, but so far as my own experience informs me it is not always so in animals, nor do all men who are bitten speak of it as painful at first. Indeed, the wound has sometimes been for a while disregarded, and at all events the hooked form of the fang, the forcible injection, and the sudden withdrawal of the weapon, account sufficiently for the pain, without supposing it to be specific. The succeeding local symptoms are rarely notable when the patient dies within
half an hour, except that in animals the muscles twitch most violently, of which we hear nothing in the human cases. As the case advances, the part swells, becomes discolored and increasingly painful, and these changes extend up the limb involved, and, reaching the trunk, swell and bloat one side, or the whole body.

This swelling is not inflammatory, but arises from the gradual effusion of blood, which has lost power to coagulate and which therefore extends from the broken vessels, at the seat of the wound. The later swelling is also due more to cedema than inflammation, although it seems probable that in man the tendency to inflammation under venom poisoning is greater than in the lower animals. In dogs bitten, the local swelling is sometimes slight, sometimes enormous, and and when cut into is found to depend on a collection of blood, either fluid or semi-coagulated. The pain which accompanies the swelling is excruciating in many cases, and does not lessen until the part becomes vesicated, loses heat and falls into gangrene. In man this process destroys the skin only, or the whole of the limb, but in dogs I have seen no such extensive sloughs, and the skin often escapes, so that we find only a small opening, and beneath it a cavity containing the debris of broken-down tissues, mixed with pus. I suspect that in man the swelling would occur less rapidly were it not for the constant use of the ligature about or above the wounded part. If the case be a serious one, the early constitutional signs of prostration continue; occasional vomiting, or at least nausea, is present, frequent syncope occurs, and the pulse continues weak and rapid.

In general the bowels are constipated, unless the case be greatly prolonged, when diarrhoea, may take place as a sequel. The mind is, in most instances, clear up to the time of death, or at all events it is only confused, excited, or subject to sensory delusions, while convulsions seem to be of extreme rarity in any period of the malady in man. The fall of temperature in the skin is usually described as an early symptom of the general weakness, but no accurate thermometric observation have been made in human cases. The duration of cases of rattlesnake bite is very various, although both in dogs and men the recoveries are often rapid and unexpected.

As it is impossible for me to dwell in full detail upon the symptoms of the venom malady, and equally impossible to describe the great variety of lesions which may occur, I
have thought best to state three typical cases of poisoning in animals, and two in men. The following are quoted in full from the essay so often referred to:

"Experiment.—The dog, a small terrier weighing about fifteen pounds, was intended to make one of a set of observations on the value of Bibron’s antidote. For this purpose he was placed in the snake-box, where instantly he was struck twice by a large snake, both wounds being double fang marks, and both being in the right flank. On removing him I observed that from one of the wounds blood was running in a thin stream. After it had run for some time, I caught a few drops in a watch-glass, and found that it coagulated well. Before I thought fit to use the supposed antidote, I was called away. Returning at the end of an hour I found the dog standing with his head pendant, having just vomited glarishly mucus. His pulse was quick and feeble, his respiration occasionally panting. The hemorrhage had ceased. Owing to an accident which at this time deprived me of the supply of Bibron’s antidote, which I had prepared, I was unable to employ the animal in the manner proposed, and not desiring to lose the observation altogether, I made use of the opportunity in the following way:

"One hour and a half after he was bitten I drew a drachm of blood from the jugular vein. It clotted perfectly.

"Four and a half hours after the bite a drachm of blood from the same vein coagulated equally well.

"Twenty hours from the time of the poisoning, the dog was found on his left side, having passed slimy and bloody stools in abundance. At intervals he seemed to suffer much from tenesmus, but was so weak that he stood up with difficulty. His gums were bleeding, a symptom I had seen before, and his eyes were deeply injected. At this time about two or three drachms of blood were drawn. It was very dark, and formed within five minutes a clot of feeble texture.

"Twenty-seven hours and a half after the time at which he was bitten, the dog was weaker. His hind legs were twitching, and the dysentery continued. Three drachms of blood were drawn as usual, but no clot formed in this specimen although it was set aside and carefully watched for some time. While I was collecting the fluid for observation the dog suddenly discharged per anum at least four ounces of dark, grumous blood. At this time I supplied the dog
with water, and left him. Fifty-four hours after the bite he was seen again, and found to have drunk freely of water and to have passed fewer stools. Up to this date he declined all food.

"From this time he improved rapidly, and took with eagerness whatever nutriment was offered. On the fourth day his blood again exhibited a clot, although it was very small and of loose texture. I made no further examination of the blood. The dog lost flesh as he gained strength, and had profuse suppuration from an abscess in the bitten flank. At the close of two weeks he was active and well, except that the wound was still open.

"The case last related is doubly valuable, as pointing out even in a single instance the time at which the blood became altered, and also as showing, once more, how profound may be this change, and how perfect the recovery.

"Experiment.—A dog of mongrel bull-terrier breed, weighing thirty-one pounds, was lowered into the cage, where he was struck on the outside of the right hind leg in the thigh. He drew up the leg when released, and whined for a few minutes. The wound, which was a double fang mark, bled a drop or two, and the muscles about it twitched considerably at intervals for an hour, when this symptom was obscured by the swelling. His pulse, which was naturally about 145 and irregular, was, at the fifth minute, 140 and regular, respiration 35. At the fifteenth minute he lay down much weakened, pulse 160 and feeble, respiration 40. At the twentieth minute the bowels moved loosely, with a gray discharge, and there seemed to be some tenesmus in the rectum. Twenty-fifth minute, pupils so far natural and mobile; he could stand when urged, but lay down again at once, and was much weaker. Forty-fifth minute pulse 160, respiration 45 and laborious. Fifty-fifth minute, loss of power in the hind legs. Eightieth minute, quick and labored, and so irregular as to make it impossible longer to count the heart pulses. The eyes were natural, and followed motions; and he wagged his tail when fondled. At this time the observation was temporarily interrupted, and, on its resumption at the third hour, the dog was found dead. He had no foam about his mouth, and probably died quietly.

"Post-mortem section.—The whole muscular and areolar tissue of the leg and thigh, half way up and down the limb, was dark with infiltrated blood. About the wound the
swelling was due to a mass of blood partially coagulated. The extravasated blood extended through the limb, and on the inside it passed half way up the sartorius and adductors, and along the sheath of the vessels to within two inches of the femoral ring. Nearly an inch of the sheath was clear of it, but one-half inch below the ring tissues were shaded with blood, and the same appearance was seen around the ring itself. From this point the extravasation extended under the peritoneum, into the pelvis, and on to the inner face of the ilium. The color of the tissues thus stained was a brilliant scarlet. The abdominal viscera were healthy, except that the mucous membrane of the lower bowels was somewhat congested. The lungs were sound. The heart was relaxed, the right side full, the left nearly empty. The blood on the right side was a little darker than that on the left; on both sides and everywhere else it was perfectly fluid and free from clots. Placed in a phial, it remained fluid until decomposition ensued. Two hours after death, some of the blood globules found in the heart were slightly indented; those taken from the small vessels of the ear were perfectly normal. At the period of examination, the muscular and nervous irritability had entirely departed."

A third observation on a smaller animal, and also drawn from a like source, will answer my present purpose.

"Experiment.—In this instance the animal, a rabbit, was struck once in the back by a large snake already exhausted by frequent use. A few minutes after the bite took place, the rabbit was seized with weakness, gritting of the teeth, and rapid respiration. It passed urine and feces, and remained feeble during some hours. From this period the weakness abated somewhat, but the back continued to swell. On the second day the local signs were improving, but the animal had passed a very albuminous urine, and a large amount of blood mixed with feces. The symptoms of general weakness now increased, the hind legs began to drag, the motions were uncertain, and the bloody purging grew worse. The rabbit died on the third day, during my absence.

"Post-mortem section.—Rigor well developed. The period of death being uncertain, the irritability of the tissues was not tested. The wound was surrounded by half an ounce or more of dark fluid blood. The vessels in the neighborhood were full of a similar fluid, but there was no
vascular redness, like that of acute inflammation. The muscles in the track of the bite, which was a double fang mark, were remarkably softened and could be torn with the utmost ease. The brain was highly congested, and there was a good deal of bloody serum in the cavities of that organ. Similar congestion existed in the spinal canal, and at several points the white nervous tissue was stained with small patches of blood. The lungs were healthy. The pericardium was curiously distended with bloody serum. The heart was contracted and contained but little blood, that dark and diluent. The intestines were spotted at intervals with ecchymoses four to five lines in diameter and apparently just beneath the serous covering, the cavity of which contained a little bloody serum. The intestines from the esophagus to the rectum were dotted with ecchymoses and filled, especially the large gut, with blood and mucus. The right kidney was large and absolutely soaked with dark fluid blood. The left kidney was more healthy. The bladder and ureters contained a good deal of bloody urine. How the rabbit lived so long with such a singular complication of serious lesions it is difficult to conceive. In most cases of chronic poisoning, some one or two organs may become the seat of local extravasations, but for extent and character of lesions this case stands alone in my experience."

The accounts given by our own authors of the cases of human poisoning are extremely meagre and unsatisfactory—the best reports being those by Sir E. Home* and M. Pihorel,† both of whom described cases which took place in showmen.

Dr. Horner’s case is perhaps one of the best among our own reports, but like the more curious one given by Sigaud,§ the patient was not altogether a healthy subject. I shall quote Dr. Horner’s case with the statement that the local symptoms were better illustrated in the second case quoted, that by Dr. R. Harlan.||

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*Engl. Phil. Trans. at large 1810, p. 75.
§Du Climat et des Maladies de Brazil, p. 394, contains the following account of the singular case above mentioned, a case so curious in every point of view that I have been tempted to add a translation of it:

"According to a popular idea in divers parts of America the bite of the North Amer. Med. and Surg. Journ. xi. 227, 1831."
"Adam Lake, aged about 40, a robust, muscular man, acting in a laborious capacity, and who, from his own account, was in the habit of drinking from half a pint to a rattlesnake cure the leprosy (lepre leontine of Alibert) without injury to the patient. Many facts would seem to show that lepers have been bitten without fatal results, not only by the coraline viper, by the jararaca, but even by the rattlesnake. Among these facts may be cited those which have been collected by Dr. Jacintho Pereira Reis, and by the deputy, Estevao, Rafael de Carvalho. The first is that of a leper of the district of Rio-das-Velhas, in the province of Minas Geraes, who having been bitten by a rattlesnake, was cured of his disease in fifteen days. The second is furnished by a negro slave of the province of Maranhao, who recovered from his leprosy in a very short time after having been bitten. M. de Lima assures us that being one day in the town of Saint Charles, province of Carabobo, in Colombia, he observed a man whose face was covered with a single large cicatrix, which at first he attributed to a burn, but on inquiry learned that it was the result of a radical cure of a case of leprosy, by the bite of the rattlesnake. The same observer tells us that an opinion favorable to this means of cure is entertained throughout the district of Bara and Apure, where leprosy is common. These statements which, after all, are but hearsay, induced a leper to resort to this fearful mode of relief. According to Dr. Jacintho Rodrigues Pereira Reis, another leper had already made this experiment in this capital, (Rio de Janeiro.) This person had the courage to allow himself to be bitten at one time by the coraline viper, and at another by the jararaca preciosa. Each time he was left for dead, but notwithstanding, gradually revived without aid. After this he still had the pain to observe that his original malady continued its fearful progress.

"Case.—Mariano Jose Machado, born at Rio Pardo, province of Rio-Grande do Sud, aged 50, had been for six years afflicted with tubercular lepra, during 4 years he had resided at the leper hospital, at Rio de Janeiro. On third of September, he came out, resolute to put to the test the bite of the rattlesnake, despite the prudent and wise counsels of divers physicians, who saw in the means he desired to employ a more than dubious chance of success, and who also were aware that the patient had not exhausted all the more available and proper remedies. The patient finally resorted to the house of M. Santas, a surgeon, Rue de Vallonga, No. 61, who possessed a rattlesnake."

After describing the appearance and character of the leprosy, and mentioning those who were present, M. Signaud continues as follows:

"Mariano Jose Machado, before proceeding, declared that he acted on his own responsibility, and then having signed a paper to this effect, put his hand into the cage and twice seized the serpent. The reptile at first fled, and finally licked his hand, but, feeling itself pinched with force, turned and bit him at the metacarpal articulation of the little finger and ring finger. The bite took place at 10 minutes of 12, September 4th. The patient did not feel the bite, and only knew of it by the remarks of those around him. His hand was a little swollen, but painless, and bled somewhat, the pulse and respiration remaining normal. Five minutes later, he experienced a slight sensation of cold in the hand, with a little pain in the palm, which, in a few minutes, increased considerably. 17th
minute, pain in the wrist. 20th minute, hand swelling. 30th m., pulse stronger and fuller, mind tranquil. 55th m., sensation of swelling in sides and back of neck; size of hand increasing; pain extends to two-thirds of the forearm. 59th m., general numbness. 1 hour and 20 min., general tremor; hyperesthesia. 1 h. 36 m., mind troubled, pulse more frequent; difficulty in moving the lips; tendency to sleep; choking sensation; intense pain in the hand and whole arm; hand swelling. 1 h. 45 m., pain in tongue and pharynx, extending to the stomach; increased pain and swelling in the bitten hand; feet cold. 2 h. 5 m., difficulty of speech, and a little later, difficulty of swallowing; anxiety; copious sweating on the chest. 3 h., weakness; nose bleeding; inquietude; pulse 96. 3 h. 4 m., general sweat, and a little after, involuntary groans; pulse 100; great pain in the arm; face injected; continual epistaxis. 3 h. 35 m., the patient swallowing wine and water readily, and changes his shirt; a red color is seen throughout the body, and a little blood leaks out of one of the pustules under the arm; the color deepens, especially in the bitten limb; atrophied pains are felt incessantly in the arms; the throat seems to be narrowed, and the breathing becomes difficult. At 4 h. 30 m., pulse 104; salivation; great heat of body. 5 h. 30 m., pulse 104; torpor; urine abundant; saliva thick; muscular weakness; groans from excessive pain; respiration tranquil; pulse full; increased swelling of the bitten hand. 7 h., somnolence; awaking, complains of great pain in the chest, and of a sense of constriction in the throat; free and full urinations; deglutition more difficult; saliva abundant; continued epistaxis; entire inability to swallow. 8 h., inquietude; copious urination. 9 h. 15 m., profound sleep. 10 h., patient took 3 teaspoonfuls infusion of guaco; refused sugar & water which were also offered; the epistaxis now ceased; pulse 108, regular; the leprons tubercles on the face and arms are a little depressed, and have erysipelatous look. 10 h. 20 m., made two ounces of clear urine; better; sleep for a few moments; pain in the chest lessened, and pain is now felt in the legs and feet, which with the bitten hand are still cold; pulse 108, regular; thirst; the patient drinks water; sitting up with facility. At 11 h., takes four spoonfuls of strong infusion of guaco. 11 h. 45 m., urinated a colored urine; continues to drink without trouble; pulse 119; arm and hand much inflamed, with excessive pain. 12 h., sleep; excitement; urination. 12 h. 30 m., sleep; anxious face; cries of pain; the patient demands the last offices of his church, and refuses remedies. Rather later, emission of urine; great heat in the limbs; the patient takes two doses of the remedy at successive half-hours; symptoms as before. 14 h., sits up twice, to drink water; the difficulty of swallowing augmenting. 14 h. 13 m., takes the remedy; sleeps; pulse 110. 15 h. 30 m., micturates; sleeps. 15 h. 45 m., takes a dose of the remedy; involuntary movements of the right hand and left leg. 16 h. 45 m., takes a spoonful of the remedy; repose; pulse 100; two emissions of urine during 17th and 18th hours; respiration being easy. 21 h. 45 m., great prostration; convulsive movements of jaw and lower extremities; bloody urine. 22 h., pulse quickened and absent at long intervals; increase of convulsive movements; diminution of swelling of extremi-
a cage. Lake being somewhat intoxicated, opened the door of the cage, and allowed one of the animals to creep out and ascend his bare arm; as it was going up, he caught the animal somewhat abruptly by the neck, it immediately struck at him, and inflicted two small wounds. In the evening he felt some itching about the bend of his arm, and he rubbed it accordingly, without thinking of the snake. The itching increasing, he was induced to examine the part, and there he found a little red spot. The recollection of the rattlesnake then occurred to him, and he began to bathe the part in salt water. This not relieving him, he called upon Dr. Elkinton, at which time the whole extremity was swollen to nearly double its size, and was very painful. Dr. Elkinton applied a dry cup over the part which had originally itched, and was bitten; it was near the cephalic vein at the bend of the arm; scarified cupping was also done in three or four places in the same region, and some ounces of blood were extracted by a repetition of the cups; the forearm was also rubbed with the terchinthinate tincture of cannari- des, which produced vesication. In the course of the evening, some doses of spirit of hartshorn were administered, and also some tablespoonfuls of the expressed juice of plan- tain (alisma plantago,) and hoarhound, (marubium vulgare.)

"The next morning (July 2, 1831,) the patient was brought to the almshouse, about half-past eight o'clock. He had vomited in the conveyance. He was sensible, and stated that the scarifications had bled much during the night; they were then bleeding freely. The arm, from the shoulder and front of the thorax to the fingers, was swollen to twice its natural size, and was very painful when moved. His pulse was almost imperceptible and thread-like, his extremities cold he was disposed to cramp in the legs, and his debility very great. His respiration was natural and easy. His eyes were muddy and heavy; his face was somewhat bloated. Feeling the desire to go to stool, he..."
was assisted from his bed for that purpose, but was seized, while on his way, with a general spasm, without foaming at the mouth; being laid down on the floor of the ward, it went off in a few minutes, and he there had an involuntary evacuation from the bowels, of a dark billious color. This occurred before I saw him. He received from the resident physician five grains of ammonia and an ounce and a half ol. olivarum.

"Sinapisms were also applied to his ankles and breast; he was directed to take liquor volat ammonia, 3j; sp. vin. dilut. 3ss, every two hours, and intermediately use ol. olivarum, 3j; of the former prescription, he took two doses before he died, and one of the oil. Another application of cups over the old scarified parts was made, and the hemorrhage from them diminished. The extremity was then enveloped in cloths, dipped into ice water.

"The symptoms continued stationary till 11\frac{1}{2} a. m., he then complained of violent pain in the course of the colon, and on taking his last dose of medicine, he said he felt sleepy, closed his eyes, and in a few minutes died without agony or convulsion.

"Dr. Harlan's case.—On Monday, the 13th of September, 1830, Daniel Steel, a showman of living animals, in this city, was severely bitten by a large male rattlesnake, immediately below and on the metacarpal joint of the index finger of the left hand; the accident occurred about four o'clock, p. m., on a warm day, while he incautiously seized the reptile by the neck, not so close to the head but that the animal was able to turn upon him. Immediately after the bite, the blood flowed freely from both the fang punctures; the parts in the immediate vicinity of the punctures became tumid and livid, notwithstanding the efforts of the patient at suction with his mouth—which faintness obliged him soon to relinquish. On my arrival, about half an hour after the accident, I found him extremely pale and faint, and was informed that he had fainted several times, the whole of the back of the hand was puffy and tumid, with infused non-coagulated blood, which appeared to have infiltrated from the vessels and forced its way through the cellular tissue; a ligature had been previously applied on the wrist; another was now placed on the arm, the forearm having already commenced swelling.

"The situation of the wound rendered the use of cups inapplicable, and the flow of blood was so rapid as to make
their application inexpedient. The punctures were separated some distance from each other, which rendered it requisite to excise two large portions of integument; the excisions extending down to the tendinous fascia; the blood, which flowed freely after the operation, did not appear disposed to coagulate; cold water was now poured on the wounds in a continued streams, from the mouth of a pitcher, held at a considerable elevation, and the swollen parts in the vicinity of the wounds were forcibly passed, in order to expel the effused blood. The patient again became very faint, and was held in a recumbent posture. The wounds were next washed with spirit of hartshorn, several doses of which were administered internally; but being now informed that the patient had drunk freely of sweet oil, the hartshorn was omitted, until the stomach should be evacuated by drinking warm water. A poultice of bread and water was next applied, to encourage the bleeding, and the patient was put to bed. At ten o'clock p. m., I was sent for in haste; the patient was thought, by attendants, to be dying. The bleeding of the wounds had been extensive, the tumefaction had extended up to the arm, the inner and inferior portions of which were discolored by effused blood; the patient vomited incessantly; he complained of insatiable thirst, and drank cold water every few minutes; he had pain and stricture at the pit of the stomach, great restlessness and anxiety, cold skin, with the exception of the wounded arm, which was very painful; add to which, there existed delirium, singultus, difficulty of breathing, and pulse at the wrist scarcely perceptible. The poultice, bandages, and all ligatures were immediately removed; the back of the hand was blacker and more swollen, and the skin of the forearm was hot and tense. As a substitute for the poultice, and in order to suppress the bleeding, which appeared to endanger the life of the patient by the debility it occasioned, large flat pieces of fresh meat, were bound on the wounds, hand, and forearm. Before this operation was completed, the patient exclaimed, 'That feels comfortable.' The indications arising from the present symptoms, were:

1. To allay irritation and thirst.
2. To arrest the vomiting.
3. To procure sleep, if possible.
4. To excite the sanguineous system to resist the depressing power of the poison, which had so emphatically manifested itself on the system in general.
“A mustard plaster was directed to be applied to the pit of the stomach; sixty drops of laudanum to be administered every half hour, until the vomiting should be arrested; after which the following bolus, to be taken every two hours until sleep should be induced:

R. pulv. opii, six grains; pulv. gum. camph., 18 grains; pulv. carb. ammonia, 50 grains. M. ft. in three boluses. Sig. as directed.

Of these pills he took three before the effects desired were manifested. On the morning of the second day, his pulse was raised; the extreme thirst and irritability of the stomach were allayed, and re-action of the system in several respects was manifested; but the tumefaction of the arm had extended to the shoulder, with broad black streaks up to the axilla; stricture at the breast and great local pain were now the chief complaints. The application of raw meat was renewed, as it afforded comfort to the patient, and appeared to reduce the swelling of the hand, and by pressure, had nearly suppressed the hemorrhage. In order to allay the pain and tension of the whole arm, he was directed to expose it naked to the fumes of burnt wool, in a convenient apparatus, which was attended by such marked alleviation of symptoms, that the patient himself was desirous to have the operation frequently repeated, and continued for two or three days; the swelling always diminishing after each application; it caused the arm to perspire profusely, and covered it with blackish soot impregnated with ammonia, resulting from the decomposition of the wool. During the intervals, the arm was rubbed with volatile liniment. The raw meat having become offensive from its disposition to ferment and putrify, was omitted, and flaxseed poultices substituted; the anodyne boluses were continued in half doses through the day, and the quantity increased at night to produce sleep. The system again became depressed and appeared to struggle with the effects of the poison; as the patient had been somewhat addicted to intemperance, he was allowed milk-punch to support his strength. On the third day, a greater degree of reaction was obvious; the bowels were evacuated by castor oil; the dose of the anodyne was diminished, and by carefully nursing the arm, in less than a week suppuration supervened, and the patient was able to leave his bed.”

It is much to be regretted that physicians in this country should have paid so little attention to the venom malady as
only to report cases in which they supposed themselves to have been successful. Hence is it that no good history of the disease can be made out from their statements, and hence it is that post-mortem examinations of the lesions are almost unknown—there being only three on record, of which two took place in Europe. The reader need not be surprised then at the small amount of accurate knowledge of symptoms placed at the author's disposal: fortunately the ability to create the disease in animals enabled us in some measure to fill up this gap.

The information now in possession of the reader will enable him, I trust, to follow the remarks upon the use of remedies. A number of these, whether local or constitutional, may be readily dismissed, either because their value or want of value is plain, or else because former observers have settled their therapeutic position in some conclusive manner.

In treating of this matter, I have been obliged to deny notice to a host of herbs which enjoy repute in small sections of our country, and which, in turn, have once possessed and lost a wider reputation. The reader who calls to mind what has here been said as to the many fallacies which surround the observer, will not fail to perceive in the accounts of these remedies given by authors the reason of their apparent success and ultimate loss of favor.—North American Medico-Chirurgical Review.

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A Statistical View of Operations on the Tongue, and more especially in reference to their danger from Hemorrhage. By Otto Just, Jr., M. D., of Zittan.

Dr. Just divides the different methods of removing the tongue into the following groups: A. Operations with the knife. 1. Amputation or partial excision. 2. Amputation by flap-incision, or wedge-like incision. 3. Total amputation or extirpation. B. Ligature. C. Ecrasement lineaire. D. Cauterization. 1. By the actual cautery, galvanocautistic. 2. By the potential cauter.
ligature the vessels with more facility, it should be fixed by forceps, or by a stout ligature carried through its entire thickness. When the incisions have to extend toward the base of the tongue, on account of the small space we have to operate in, the procedure becomes more difficult and the arrest of hemorrhage is not so easy. In these cases more room can be gained by slitting open the cheek of the affected side, or by drawing out the tongue through an aperture in the neck, or by sawing through the symphysis of the lower jaw. These methods will, however, be unnecessary if the lingual arteries be previously ligated. 2. Wedge-like excision.—Under this head are mentioned 12 cases of cancer, one of telangiectasis, and 11 of hypertrophy. 3. Exterpation.—The author considers this operation justifiable when the whole of the tongue is diseased. Of three cases, one recovered.

Methods of stopping the hemorrhage.—The following means were employed for the arrest of hemorrhage, in 62 cases in which it is mentioned: In 29 cases, ligature of the vessels in the wound; in 2, ligature en masse; in 7, prophylactic ligature of the lingual artery; in 7, the actual cautery; in 6, ice and cold water; in 7, suture of the edges of the wound after flap-incision; in 3, styptics; in 1, bleeding spontaneously stopped. Ligature of the arteries in the wound is the safest method, and has never been followed, when employed alone, by secondary hemorrhage. The actual cautery, cold or styptics should be restricted to slight cases. Secondary hemorrhage ensued rather frequently when the actual cauterity had been applied. Suture of the edges of the wound is unsafe, for in three-sevenths of the cases it was followed by secondary bleeding. Ligature of the lingual artery above the hyoid bone should be resorted to when the base of the tongue is diseased and the mouth of large size; two of these cases died of pyaemia.

Period of recovery.—The most rapid recoveries took place when sutures had been used after excision of a wedge-shaped piece; in 16 of these cases, 14 united in from 6 to 14 days. After amputation in general, it required from 12 days to 4 weeks. The cases treated by sawing through the symphysis took from 1 to 2 months.

Result.—Eight of 86 cases terminated fatally, being 11 per cent. In 5 cases death resulted from pyaemia.

B. Removal by ligature.—Nineteen cases are quoted of ligature for cancer, and 7 for hypertrophy; and 2 of these
ended fatally, 1 from pyæmia, and 1 from poisoning by the offensive discharge. This method is troublesome and disgusting from the very fetid discharge, occasioning the patient great misery. Gangrene commences in about 24 hours after the application of the ligature, and on an average 11 days are required for the separation of the mass. The wound left after the detachment of the slough will heal generally in about 14 days. Hemorrhage occurred in three instances, twice from too early a separation of the ligature, and once from the wound made for the passage of the thread.

C. Amputation by means of ecraseur ligneare.—The ecraseur has answered an excellent purpose in removal of the tongue, hemorrhage being effectually prevented when the instrument is made to act slowly. Twenty-one cases were treated by this method, and all recovered, the period of convalescence averaging three weeks.

D. Amputation by means of the cautery. 1. By the galvanic cautery.—Eight cases come under this head, hemorrhage attending 4. The vessels required ligation in the wound twice, and once after previous ligation of the lingual artery. Secondary hemorrhage followed in about one-third of the cases. To prevent bleeding, the wire should be thick, the galvanic current weak, and the wire of the loops should not be heated beyond a black heat. 2. Extirpation of the whole tongue by means of the potential cautery.—One case only is given, in which the organ was destroyed by means of chloride of zinc.

The author has collected 72 cases of cancer of the tongue, in 49 of which the subjects were males, in 23 females; the frequency in males being pretty nearly in the ratio of 5 to 2. In 63 cases the age is noted, showing that it occurs most frequently between 40 and 60 years. In 55 cases the seat of the disease was, in 7, the tip of the tongue; in 9, the whole breadth of the organ; in 19, the right; and in 20 the left side. In 72 cases there were 18 recurrences; but the number is too small, as many of the cases were published soon after the operation.

To sum up the different methods of treatment, we find that the knife is especially adapted for removing small portions near the tip of the organ; the ligature has but one advantage, that of preventing hemorrhage, and the ecraseur has shown more favorable results than those of the knife.—*London Medical Review.*
Further Experiments Relating to the Diuretic Action of Colchicum. By William A. Hammond, M. D., Professor of Anatomy and Physiology in the University of Maryland.

In the Proceedings of the Academy of Natural Sciences, of Philadelphia, for November, 1858, I gave the results of a series of investigations relative to the diuretic properties of digitalis, juniper, squill, and colchicum, by which it was shown that the latter alone possesses the power of increasing the amount of organic matter eliminated by the kidneys. From this circumstance, the argument was adduced, that this substance, of all those experimented with, was the only one that could be regarded as a true depurator of the blood.

The results obtained by earlier investigators cannot be regarded as satisfactory, owing to the faulty manner in which their analyses were made. The urine was concentrated by heat, and thus a large quantity of its organic matter underwent decomposition.

Since the publication of my experiments, Dr. Garrol, of London has studied the physiological action of colchicum; but, led away by his theory of the nature of gout, he limited his researches mainly to the determination of its influence over the excretion of uric acid, which, as is well known, forms but a small proportion of the total amount of organic matter excreted by the kidneys. As the result of his investigation he announced that colchicum does not increase the quantity of uric acid contained in the urine, and that it is not by any action on the kidneys that the remedy in question exerts its curative influence in gout. His result, as relates to the uric acid, does not, so far as I know, conflict with mine, as I did not separately determine the quantity of this substance present; but his conclusion, that colchicum is not a diuretic in the true sense of the term, is certainly not borne out by his own experiments, and is directly at variance with those which I performed.

It was, therefore, obviously necessary that additional investigations should be instituted, and I accordingly undertook the task of furnishing further contributions to the subject. Before proceeding to detail these, I desire to call attention to the valuable memoir of Prof. Austin Flint, in the number of this journal for November, 1860, entitled "Clinical Researches on the Action of Diuretic Remedies." In
this essay, in addition to much other valuable matter, the
conclusion at which I had arrived relative to the action of
colchicum is confirmed; Prof. Flint finding it to produce a
marked increase in the amount of solid matter eliminated
by the kidneys, without, however, increasing the quantity
of water of the urine.

The investigations to which the present paper relates
consisted of experiments upon adult males, in a good con-
dition of health. In all cases, the officinal tincture of the
seeds of the colchicum autumnale was given.

The determinations made were the following:
1st. The quantity of urine.
2d. Its specific gravity.
3d. The total amount of solid matter.
4th. The quantity of inorganic matter.
5th. The quantity of organic matter.
6th. The amount of uric acid.

The quantity of urine was determined in cubic centi-
metres.

The specific gravity was ascertained by means of the
specific gravity bottle and a delicate balance.

The total amount of solid matter is given in grammes,
and was determined in the following manner:

Ten cubic centimetres of the urine were evaporated to as
complete dryness as possible in vacuo over sulphuric acid,
and the residue accurately weighed. By simple proportion
the amount of solids in the whole quantity of urine was
easily ascertained.

Although it is impossible to get rid of all the water by
this process, the quantity remaining is extremely small,
and the results obtained are far more accurate than those
obtained by evaporating to dryness in the water-bath, as
generally practiced. No matter how carefully this latter
process is conducted, the loss of urea by decomposition is
always an important item, and involves far more serious
errors than the imperfect declaration by the former pro-
cess.

For the determination of the amount of organic and in-
organic matter separately, the solid residue obtained as
above was mixed with ten or fifteen drops of moderately
strong nitric acid, and gently heated till the mass was well
dried. The heat was then gradually raised till all the car-
bon was consumed, and the mass, in consequence, became
white. It was then cooled in vacuo over sulphuric acid.
and weighed. The inorganic matter was thus determined, and the loss showed the proportion of organic substance.

The quantity of uric acid was determined by adding chlorhydric acid to a known volume of urine.

The first experiments were instituted upon myself. In three days immediately preceding their commencement, the average quantity of urine for each day was 1425 cubic centimetres, of specific gravity 1021.73. The average amount of solid matter was 70.15 grammes; of which 30.90 were inorganic, 39.25 organic substances. The average amount of uric acid excreted for each period of 24 hours was 0.77 grammes.

During the experiments with the colchicum my manner of living was not materially altered from that of the three days above referred to; i.e., I ate the same food and took the same amount of exercise, and endeavored to make all the collateral circumstances the same, so as to ascertain as nearly as possible the exact effect produced by the colchicum.

First day. On this day I took one fluid drachm of the tincture three times; at 8 a.m., 2 p.m., and 10 p.m. The total quantity of urine excreted was 1685 cubic centimetres, of which the specific gravity was 1021.50. The total amount of solids was 70.15 grammes, of which 30.90 were represented by inorganic, and 39.25 by organic matter. The quantity of uric acid was 0.81 grammes.

Second day. One and a half fluid drachms of the tincture were taken, as on the previous day. Quantity of urine, 1720 cubic centimetres; specific gravity, 1020.87; total solids, 75.29 grammes; inorganic solids, 32.44 grammes; organic solids, 42.85 grammes; uric acid, 0.69 grammes.

Third day. Same quantity of colchicum taken as on previous day. Quantity of urine, 1784 cubic centimetres; specific gravity, 1022.57; total solids, 80.13 grammes; inorganic solids, 35.11 grammes; organic solids, 45.03 grammes; uric acid, 0.78 grammes.

Fourth day. On this day the quantity of colchicum was reduced to half a fluid drachm, taken as before. Quantity of urine, 1540 cubic centimetres; specific gravity, 1023.17; total solids, 69.23 grammes; inorganic solids, 31.09; organic solids, 38.14 grammes; uric acid, 0.78 grammes.

Fifth day. On this day the quantity of colchicum was increased to 1½ fluid drachms of the tincture before mentioned. Quantity of urine, 1698 cubic centimetres; specific
gravity, 1023.68; total solids, 76.14 grammes; inorganic solids, 33.26 grammes; organic solids, 42.88 grammes; uric acid, 0.75 grammes. On this day there was some derangement of the general health, manifested by increased heat of shin, fever, and severe abdominal pains. There was also a little diarrhœa. The experiments were, therefore, discontinued.

From an examination of the results obtained by the foregoing investigation, the effect of the colchicum upon the urinary excretion cannot fail to be perceived. The conclusions which I think may be formed are:

1st. That the colchicum increases the quantity of urine.
2d. That its increases the total amount of solid matter eliminated.
3d. That this increase is mainly due to an augmentation of the organic matter.
4th. That the amount of uric acid does not appear to be affected.

These conclusions are rendered much more probable from the fact that on the fourth day, when the quantity of the tincture of colchicum taken was reduced one-third, the effect upon the urine was less decidedly marked; and that when, on the fifth day, it was again augmented to a drachm and half, the urinary excretion was materially increased in quantity, and the solids, the organic especially, remarkably raised in amount. The relation of cause and effect would therefore appear to exist; and accordingly, it would be contrary to the principle of sound reasoning to assert that the change in the composition of the urine was accidental. It is doubtless true that the urine changes greatly from day to day, and even from hour to hour; but this fact is due to the other fact, that we are constantly varying our food, exercise, &c. When, however, as in the investigation cited in this paper, these circumstances are fixed, and only one difference exists between the ordinary mode of living, and that practiced during the continuance of the experiments, we are justified in attributing any change in the urine or in any other excretions to the influence produced by that difference.

In the next series of experiments the effect is just as directly shown, though, for reasons beyond my control, they were not continued as long as was desirable.

The subject of these experiments was a young man 23 years of age, and weighing about 140 pounds. Before tak-
ing the colchicum, I examined his urine whilst he was taking a fixed quantity of food and exercise, he being at the time an attendant in the hospital under my charge. As the results of these examinations for three consecutive days, I obtained the following as the averages for each day: Quantity of urine, 989 cubic centimetres; specific gravity, 1020.14; total solids, 51.20 grammes; inorganic solids, 22.45; organic solids, 28.75; uric acid, 0.47 gramme.

First day. On this day one drachm of the tincture of colchicum was taken three times. The effect upon the urine was as follows: Quantity, 1021 cubic centimetres; specific gravity, 1024.18; total solids, 64.25 grammes; inorganic solids, 23.57 grammes; organic solids, 40.68 grammes; uric acid, 0.59 gramme.

Second day. One and a half drachms of the tincture were taken to-day three times, as previously. Quantity of urine, 875 cubic centimetres; specific gravity, 1026.11; total solids, 60.25 grammes; inorganic solids, 20.38 grammes; organic solids, 39.87 grammes; uric acid, 0.51 gramme.

On this day diarrhoea was produced. This was of quite a severe character, and in consequence, the colchicum was not further continued.

The remarkable effect of the colchicum in increasing the amount of organic matter excreted is, however, very decidedly shown. This increase is so great as to render the probability of its being accidental extremely small, and we cannot do otherwise than regard it as being directly due to the influence of the colchicum.

The details of the third case in which the colchicum was given have been unfortunately mislaid. I am, however, enabled to state with certainty, that the same well-marked effect over the amount of organic matter excreted by the kidneys was exerted as in the cases the particulars of which have been in full. The experiments were continued for six days, with variable quantities of the tincture.

What are we to infer from these investigations? It appears to me that the conclusion must be admitted that colchicum is a true deputator of the blood, and hence we have an explanation of its good effects in those blood diseases, gout and rheumatism.

It is seen that no constant effect was produced upon the quantity of uric acid eliminated, and hence these experiments do not conflict with those of Dr. Garrod. We are
not, however, bound to admit the presence of uric acid in the blood in increased amount during a paroxysm of gout or rheumatism, is the cause of that paroxysm; and consequently, because colchicum does not increase the quantity of this substance found in the urine, we are not to suppose that the remedy in question does not exert its influence through the kidneys.—Am. Med. Monthly.

The following are from Dr. O. C. Gibb's Monthly Summary:

Delirium Tremens treated with Digitalis.—In the American Medical Times, for December 1st, is the report of two cases of delirium tremens, treated with large doses of digitalis, by the advice of Dr. Stephen Smith. In both cases the delirium was active at the commencement of treatment. Tinct. of digitalis was ordered in two-drachm doses, and to be repeated every two hours until the patient slept. After the administration of the second dose both patients became quiet, and one of them slept; the other slept after the fourth dose. In one case the pulse came down from 108 to 82.

It will be remembered that, some month ago, we recommended veratrum viride in the stage of excitement of delirium tremens. The indications for the use of the digitalis are based upon the same principles. We cannot help thinking the veratrum viride is the safer of the two. Quinine and strychnine we would recommend after the stage of excitement is passed, to give tone to the nervous system. Though we have never used it, we cannot help thinking that from 10 to 15 grains of quinine might be given with benefit, even in the stage of excitement; we should expect it, in connection with veratrum, to produce quiet and free perspiration. We believe that opium has been the death of many patients suffering from delirium tremens.

Diphtheria.—In the American Medical Times, for Dec. 8th, Dr. Wm. M. Turner has an article upon the subject of diphtheria, and more particularly its treatment. His views are stated with earnestness, and his treatment given in detail, and in a tone that gives evidence of a supposition of novelty. His views of its pathology are doubtless correct,
and his treatment judicious; but the pathology and treatment are such as have been for some time advocated by the first physicians of Europe and this country. But one novelty is mentioned, and that will be alluded to. In regard to its nature he says: "I think the disease is owing to malarial influence, and that it is essentially a blood-poisoning, with a great degeneracy and breaking down of the vital force."

We will not enter into detail in regard to treatment; it is thus briefly stated: "Tonic and disinfectant, (the latter internally and topically,) all combined with rich diet. Best local disinfectant, in form of gargle, Labarraque's solution et aqua pura, or any gargle in which, with other ingredients, a disinfectant bears a large proportion." The novelty to which we have referred, and because of which we have referred to this paper, is in regard to local means. He says, "I studiously avoid probangs; I look upon them as instruments of torture and of death. I know I have seen cases which died from the constant mopping to which the throat was subject."

Among the local means employed, the following is well spoken of: "Equal parts of ol. olivse and spir. terebinth," * * "to be applied with a soft rag, and touched very gently." In addition, a flannel rag, saturated with ol. terebinth., is applied to the neck externally.

Glycerine and Camphor as an Antiseptic.—In the Savannah Journal of Medicine, for November, Professor Juriah Harris has an article upon the influence of remedial agents in arresting the secretion of milk in the human female. In regard to belladonna, he says, he has used it often and perseveringly; and as to its power over milk secretion, he says: "In this, I have been invariably disappointed. In no case has it come up to my expectations; indeed, I have never seen any beneficial results from its use." To us this result seems very singular, as we presume we have used it fifty times for the purposes designated, and it has never disappointed us. In cases of premature delivery, where the secretion of milk was to be expected, and also where the child was still-born, in cases of mature birth, we have commenced very soon, with the local use of Tiden & Co.'s fluid extract of belladonna, and a mammary abscess has not occurred to us as the sequel of such cases. When we remember how common such abscesses were wont to be, in such cases, in our
Sutures.

practice, anterior to the use of belladonna, we cannot think this different result is altogether accidental.

Prof. Harris prefers, and speaks highly of, a saturated solution of camphor in glycerine. With this he lubricates the surface of the gland, and covers the same with a flannel cloth moistened with the same; the application to be made at least three times a day. He regards it equally efficacious in sore nipples; though, for this purpose, he usually adds four grains of tannin to the ounce of the mixture.

Silver Sutures.—In the American Medical Times, for December 15th, Dr. T. C. Moffatt has the following remarks upon silver sutures: "For three years past I have used nothing else in operations of every kind where sutures have been required. In all amputations, from that of the thigh to the fingers, I have almost invariably employed the silver suture alone. Its advantages are manifold and palpable; indeed, I can heartily subscribe to all that an enthusiastic friend has said of them, so far as my experience will warrant me in saying anything, at all. My custom is, in large amputations, to put in so many of them as perfectly to coaptate the flags, and to leave them in as long as they subserve any useful purpose. They may be allowed to remain for an indefinite period, without the risk of exciting undue inflammation, or even irritation. I have often left them in until after the stumps had entirely healed, without occasioning inconvenience of any kind. They always hold the parts in more perfect apposition than silk can do, for the reason that they do not appear to cause any suppuration at all."

As connected with this subject, we would refer to a paper by Dr. John Swinburne in the Medical and Surgical Reporter for December 8th. He there recommends as a universal substitute for all forms of sutures, to be applied upon the surface of the body, the common entomology pins. He says: "The introduction of small entomology pins is attended with but little pain in comparison with that produced by the passage of a needle and thread. The points are so carefully prepared and the instrument so perfect that patients declare the pain to be much less than that accompanying the drawing through the thread, even after the needle has perforated the skin. By the use of those, the edges of a wound can be approximated in the nicest possible manner by means of the thread as used in ordinary
hare-lip operations, so that union by the first intention is more sure to follow than in any case of simple interrupt-
ed or even quilled sutures. This pin, from its tenderness and pliancy, will bend and accommodate itself to the parts, thus doing away with the chief objection to the use of the stiff common pin." He says further: "I have used the silver wire a long time, and believe that the encomia passed upon it are deserved; but that it is, on the whole, unequal in value to, and not so worthy of employment, as the pin, will be evident from a tabular comparison:

<table>
<thead>
<tr>
<th>Silver Wire</th>
<th>Pin Suture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Expensive and difficult to obtain.</td>
<td>1. Cheap; 75 cents per thousand.</td>
</tr>
<tr>
<td>2. Pain and difficulty in introducing.</td>
<td>2. Less painful, and easily introduced.</td>
</tr>
<tr>
<td>3. Danger of tearing soft and tender skin in the process of twisting.</td>
<td>3. The most delicate skin is in no danger of being lacerated.</td>
</tr>
<tr>
<td>4. The interstices between the sutures have to be supplied by adhesive plaster, &amp;c.</td>
<td>4. The edges of the wound are completely covered by the thread through its whole extent.&quot;</td>
</tr>
</tbody>
</table>

Entomology pins were, perhaps, first used by Prof. Alden March, of Albany (see Transactions of the Medical Society of the State of New York, for 1855.) Prof. March, however, only used them as hare-lip pins. This priority of use by no means detracts from the honor due to Dr. Swinburne, who recommends them as universal sutures.

Varicose Veins of the Leg.—The treatment of this troublesome affection is a matter of interest, and more particularly so because surgeons of equal eminence differ in regard to it. We quote a few opinions that have fallen under our observation during the last month. In the American Medical Times, for December 1st, Prof. A. C. Post makes the following remarks: "The treatment of varicose veins is palliative or radical. The radical treatment consists in obliteration of the diseased vessels, and the process is always attended with more or less danger to life; it should therefore be reserved for aggravated cases. The palliative treatment consists in giving a uniform support to the limb by means of bandages, or of elastic laced stockings."
Varicose Veins of the Leg.

Previously referred to the radical treatment of varicose veins by subcutaneous application of the metallic ligature, as practiced by Dr. R. J. Levis. In a private letter to us, Dr. Levis says his method of cure "is always efficient, and is absolutely safe." In the American Medical Times, for December 15th, Dr. T. C. Moffatt has a few remarks upon the treatment of this affection by injection into the diseased vein. We quote one case in illustration. The case referred to was an unusually bad one. Dr. Moffatt says: "Placing a tourniquet upon this (the most prominently enlarged vein) above, and making pressure below, so as to isolate about two inches of the vein, I threw into it eight drops of the persulphuret of iron diluted with as much water.—(Squibb.)" The instrument used was the syringe commonly employed for injecting morphia into the cellular tissue. After a few minutes the pressure was removed, and a hard plug remained; the blood coagulated almost instantly. The inflammation which followed was not immoderate. Cooling anodyne lotions were applied, and subsequently lead poultices. A very slight amount of suppuration resulted, and in just three weeks the limb was perfectly cured."

Bearing upon this point, Prof. E. S. Cooper, in the October number of the San Francisco Medical Press, has a few remarks. He has not much confidence in the treatment by injections of Monsel's salt. That the injection will produce an immediate clot, he does not doubt; but this clot will arrest the undecarbonized blood in its way back to the heart, and this arrested blood will become a great source of irritation. He says, "After trying the various methods of treating varicose veins of the lower extremities, we are convinced that there is none like that of free incisions, followed by keeping the wound open until granulations begin to fill up the incision, in the mean time keeping a roller as tightly upon the limb as the patient can conveniently bear, commencing its application at the foot. By this means, blood is prevented from entering the veins to any considerable extent."

Besides the objections to the injections above stated he says: "We do not believe that even a very small quantity of Monsel's salt can be introduced into a blood-vessel, without risk of fatal consequences."

Gentlemen:—For several years the reports sent to the Academy of Medicine, the communications addressed to various scientific journals, have indicated that fatal epidemics of diphtheria prevailed in different parts of France, invading all departments; those of the south, as well as those of the north, of the west, and of the east. These epidemics also prevail abroad, in England, where for sixty years it has hardly been known; in America, in Germany, and in the Spanish Peninsula. The attention of the public, as well as of physicians, is more than ever aroused in relation to this dreadful calamity. The cases which have lately increased in my service afford me the opportunity of giving you my ideas upon this important subject, and it is my duty to communicate them to you. I shall, then, in a series of lectures, consider this disease, one of the most serious which affect humanity. I do not intend to exhaust the subject, promising some day to write a treatise upon diphtheria. I shall, therefore, take up only the most practical points, illustrating them, as far as possible, by the patients we shall see together. Do not expect, gentlemen, a resume of the numerous observations which have been made under your eyes. In making use of them, in sustaining my propositions by the experience of my confreres, and that of different authors who have written upon the subject, I shall be chary of long histories, citing only what is necessary to make everything I say clear and comprehensive to you. I shall also insist, gentlemen, upon the necessity of a treatment the utility of which is to-day questioned. I shall oppose that deplorable tendency among observers of the highest order to leave the true road, which has been persevered up to this time.

Diphtheria is a specific disease, par excellence, contagious in its nature, displaying itself upon the mucous membranes and the skin, and presenting the same characteristics in both places. I say, that it shows itself upon the skin and mucous membranes, because, in fact, diphtheria has this in common with certain specific and contagious diseases, as eruptive fevers, syphilis; with this difference, however, that it affects the external teguments only when it is denuded of its epidermis. Still, the disease which we are about to study shows a marked preference for the pharynx, for the air-passages, the larynx especially, constituting the af-
fections commonly known under the denominations of malignant, false membranous angina, otherwise designated gangrenous sore throat, suffocating angina, and now more particularly called croup, when the angina seizes upon the larynx. Diphtheria is frequently observed to attack the nasal mucous membrane, the buccal mucous membrane, the vagina, the prepuce, the glans penis. Of all the different forms, whether pharyngeal, laryngeal, nasal, buccal, vaginal, anal, or cutaneous, the first is by far the most common. In certain epidemics, it is this form it almost exclusively assumes, destroying those affected, by its extension to the larynx and trachea, by croup, in a very different manner from malignant diphtheria, which kills by a kind of general poisoning like septic and pestilential diseases. To this first form the attention has always been more particularly drawn, because it is the most common; it is this which has been described by the older writers, and which served as a type for the treatise on diphtheria by M. Bretonneau; it is with this that we shall commence the study we are about to undertake.

Diphtheritic Angina and Croup. (Pharyngeal and Laryngeal Diphtheria.)

A young boy, four years old, in excellent health, was suddenly taken with symptoms in the throat, which at first were so slight that they did not alarm his family. After a day or two, it was noticed that he grew pale; that he was quieter than usual, and remained indifferent to his ordinary playthings. He coughed a little, but had no fever, and although his appetite was not as good as usual, he still sat up all day. Accident alone revealed the disease with which he was attacked. The family physician, who had been called to see another infant affected with epileptiform vertigo, was casually consulted for the boy. He was struck with the pallor of the skin, and perceived a slight swelling in the submaxillary region. Thus, having ascertained the existence of tumefied ganglions, he examined the throat, and found the pharynx and the tonsils quite red, while the latter were increased in size, and one of them, the right, was covered with a quite thick grayish membrane. He immediately decided that the case was one of diphtheritic angina, and acting upon this belief, he instantly cauterized the diseased part with the caustic nitrate of silver, taking care to detach the false membrane by means of the nitrate.
The cauterization was repeated the same evening, and the next day both morning and evening, and in the interval between the cauterizations he made, or had made, several insufflations of the powder of alum. The child was well fed, according to the express instructions of the physician, and took, besides, a tonic mixture, the base of which was the wine of cinchona. The disease was arrested, but the general pallor continued for some time, and a paralysis of the veil of the palate succeeded. The child was taken into the country, returning at the end of six weeks in perfect health.

This, gentlemen, is an example of pharyngeal diphtheritic angina. The insidious manner in which the disease began, the mildness of the general symptoms, the absence of fever at the time the physician ascertained the condition of the patient, the soberness of the child, the pallor of the skin, the tumefaction of the submaxillary ganglions, and finally, the presence upon the right tonsil of the characteristic false membrane, abundantly sustain the diagnosis. The paralysis of the veil of the palate, which occurred a few days after, also confirms it, and I have no doubt the energetic treatment adopted in the early stages cut short the disease, which might have extended by degrees, and having invaded the larynx, would have produced croup.

Pharyngeal diphtheritic angina is observed at all seasons, in all climates. It is not without a certain degree of astonishment that I somewhere read that this disease was seen more especially in northern countries, in cold and moist climates, and that it was almost unknown in the south of France and Italy. Whoever advanced this singular assertion,* must have had a very slight knowledge of the history of medicine, not to know that the disease described by Arctæus, and which was none other than a pseudo-membranous angina, was endemic in Egypt and Syria, whence the name of Egyptian Ulcer and Syrian Ulcer, which was given to it at an epoch contemporaneous with Homer rather than Hippocrates, according to M. Bretonneau, or not to know that Carnevale, Nola and Sgambati have given to us histo-

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* In opposition to this proposition, we recollect that an author of the last century, Wedel, has said, that diphtheritic angina, which he called angina infantilis contagiosa, was more frequent in Italy than in the north of Europe. "In Italia frequentior quam apud Boruales magis Europaeos." —De Morb. Infant., cap. 20, page 77.
Lectures on Diphtheria.

Stories of epidemics of the *morbus strangulatorius* which reigned in Italy at the commencement of the 17th century; while Villareal, Fontechea, Nunez, Herera de Heredia, Mercatú, and Tamajo observed it at the same time in Spain. At this time we see that these same sore throats prevail throughout all France, as I have already said. It would seem that in the same latitude pharyngo-tracheal diphtheria became developed at the time that catarrhal affections are most common.

Diphtheria spares no age; still, it principally attacks young subjects, and ordinarily those between the ages of three to five and six years.

It commences by a greater or less redness of the pharynx, by a swelling of the tonsils, most usually of one only, upon this is soon seen to appear a very sharply circumscribed whitish spot, at first formed by a layer resembling coagulated, semi-transparent mucus, which becomes thicker, and very rapidly takes on a membraniform consistency. This exudation, when first formed, is easily detached from the mucous membrane, to which it adheres only by very fine filaments, which penetrate the muciparous follicles.

The mucous membrane underneath is perfectly healthy with the exception of the destruction of the epithelium and if sometimes it appears furrowed, it is, because around the exudation it is swollen, and forms, by this means, a kind of depression. Ulceration is the exception. Generally, I repeat. the mucous membrane is healthy, or at least presents no alteration beyond an increase of vascularity, for upon detaching the false membrane with care, it can be removed without being followed by the least sign of blood. By means of the microscope, the epithelium of the mucous membrane, with its vibrating cilia, may often be seen upon its adhering surface.

After a few hours the pseudo-membrane, convex at its centre, thin at its edges, has increased; it now covers almost the whole tonsil, is adherent at the points where it first appeared, and has taken on a yellowish-white color. This color may vary from a yellowish-white to a deep yellow, to a gray, or even to a black. Then the veil of the palate usually commences to be inflamed, the uvula swells and after a few hours more, or a day, the side of the uvula corresponding to the tonsil which is covered with a false membrane becomes covered with an exudation of the same color. Frequently, within the space of twenty-four o
thirty-six hours, the entire uvula is enveloped like the finger of a glove. At the same time, a spot of the same nature appears upon the other tonsil, which is soon entirely covered by it. The bottom of the pharynx beginning to be lined upon both sides, long, narrow, longitudinal streaks of a deep red are sometimes seen, in the midst of which are formed lines of concrete matters; sometimes membranous patches, which finally unite with each other. At this time, if the child be docile, and can be easily examined, by pressing down the tongue, the uvula, both pillars of the veil of the palate, both tonsils, and the bottom of the pharynx will be found completely covered with the coating I have just described. Portions of these false membranes can be detached by means of a pair of forceps; we have removed some in this manner, which, having enveloped the uvula, had the form of a sewing thimble.

Generally, from the commencement, the lymphatic ganglions at the angle of the jaw, those necessarily which correspond to the tonsil first attacked, are engorged. This, gentlemen, is an almost invariable symptom, which is not absent once in ten times. Its importance is then considerable, so much the more for the reason, that in ordinary angina, a disease usually of no serious-ness, but which might be confounded with the disease of which we are speaking, this ganglionary engorgement is generally absent; or if it be present, it is in a much less degree than in pharyngeal diphtheria.

On the invasion of the disease, the fever is high, but it diminishes after the second day, and entirely subsides the following day, or the day after; the patient feels only a slight malaise, evidenced by a desire to be at rest; a sense of feebleness; and as the only thing complained of is a difficulty often very slight, in deglutition, the beginning of the disease is not usually alarming.

Left to itself, it remains for three, four, five, or six days limited to the pharynx; the older the person, the longer the period of development, the longer it takes for the disease to invade progressively the parts within sight. If it be the fact, that false membranes form more rapidly in infants than in the adult, it is, perhaps, because the blood of the former is richer in plastic materials than the latter. It is always the case that in children of three, four, five, and six years, the two tonsils and the posterior part of the pharynx can be covered with diphtheritic concretions within
thirty-six to forty-eight hours; in the adult, and particularly in old persons, five, six, seven, and eight days pass before all the parts are completely covered.

In patients whose pharynx can be well examined, the false membrane may be seen increasing each day by the addition of new layers which are formed underneath the first developed. These different layers take on a stratified arrangement. The most superficial become softened, and are easily torn; altered in their color by the food, the dregs of the matters vomited, the medicines taken by the patient by blood from the pharynx or posterior nares, these membranes become grayish, black, and resemble the detritus of gangrene. The resemblance is the greater, from the fact that, in these conditions, the false membranes putrefy and exhale a very repugnant fetid odor. This was the case when you may recollect, with the young girl twelve years old, recently had under our observation in the ward St. Bernard. Her breath had an insupportable gangrenous odour; and when we removed the detritus which covered the tonsils and the veil of the palate, by means of a pledge of charpie, we found it to be composed of a grayish matted detritus which was very like the detritus of gangrene. And yet it was not, for when the diseased surfaces were afterward cleaned, the mucous membranes, but a short time before covered with false membranes, appeared red, hardly excoriated, but showing no traces of gangrene.

This appearance of gangrene which the diphtheritic production assumes, is a point sufficiently important to be considered more particularly. It explains to us how, for a long time, diphtheritic angina was confounded with gangrene, angina, and gave rise to the names of angina, of gangrene sore throat; names which some physicians use even at the present day.

If we study diphtheritic angina in the infant and compare it with what occurs in the adult, we shall observe that the disease almost never presents the gangrenous aspect which, on the contrary, is very frequently seen in the adult. Should we therefore conclude that gangrene is really present in diphtheria of the adult? No! These are only appearances of gangrene, and do not exist in the adult as more than in the child; there is no true gangrene, unless in exceptionally rare cases; so rare, that, in the whole course of my medical career, I have met only three examples of it. I admit it is very difficult not to believe in
ven now, although I have so seldom witnessed gangrene in these cases, although I know when a recovery has taken place, or when, at the autopsy, with the pathological specimens in my hand, I discover no traces of sphacelus upon the tonsils or the mucous membranes, finding only some light excoriations, and in many cases not even these; notwithstanding this, I cannot at first, even now, disabuse myself of the idea that gangrene exists. In the young girl of the ward St. Bernard, I was sure that there was no gangrene, and you also were convinced of it; still, the extreme crassity of the breath, that grayish secretion which covered the tonsils, could not fail to suggest to our minds a morbid condition of the mucous membrane, a sphacelus of the subcutaneous cellular tissue, or even a deeper destruction of the tissues.

These are the reasons why diphtheritic angina has been unfounded with gangrenous angina; why certain physicians still confound these two diseases; and why, in the description of epidemics of croupal angina, you still often speak of gangrenous sore throat, even when they were only follicular or pseudo-membranous affections.

One word more, relative to the mode of circumscription of the membranous exudations at the points upon which they are developed. Sometimes they are surrounded by a half bright-red line; sometimes they do not appear limited; and, as I remarked in the beginning of my lecture, the membranous concretion, growing thinner at its edges, reads out over the surrounding parts. In such a case, the tendency to spread is greater and more to be feared than the former.

If pharyngeal diphtheritis, left to itself, does sometimes come limited to the pharynx, examples of which have been cited by M. Bretonneau, and which every one may serve in certain epidemics, it usually, however, continues its progress. In some cases it passes into the oesophagus, and reaches even to the cardiac orifice. The distinguished physician of Tours has reported two instances of this character, and Borsieri has instanced others; but almost invariably it invades the larynx and trachea, and constitutes dyp. This is its ordinary course, the most common termination of diphtheria. In fact, we see more persons afflicted with this disease die of croup, than from those malignant anginas, of which I shall speak hereafter, which destroy life in the manner of septic diseases.
The propagation of the diphtheritic affection to the larynx was noticed a long time ago. Aretaeus speaks of it in his chapter, De tonsillarum ulceribus, where you will find the first mention we have of membranous angina, which he designated under the name of ulcer a pestifera, repeating the names of Egyptian, Syrian ulcer, by which it had been called. Read the histories of epidemics recorded in the annals of medicine, and you will see that the propagation of the disease to the larynx was perfectly well known, and that it particularly occupied the attention of physicians. Whatever name was given to it, the laryngo-tracheal affection indicated as the cause of death, and hardly anywhere is there any mention of the malignant form of which I have just spoken.

I repeat, then, that persons affected with laryngeal diphtheria die from croup; and I speak not only of that disease which is developed in isolated cases of sporadic diphtheria, but also of that which takes place in a great number of cases during an epidemic.

When, then, are the symptoms of that affection called by the Spaniard and Italians of the 17th century, garrotillo male in canna; by their physicians, moccus strangulatorius by the Americans, at the close of the last century, suffocating angina, and which we to-day recognize as croup, a name given to it by the Scotch?—Am. Med. Monthly.

Diphtheria.

The subject of diphtheria receives more than usual attention in the journals for January, of which the present article is a summary. Risking the charge of repetition, we shall endeavor to give, in as few words as possible, the practical import of the papers that have come under observation. In the Maryland and Virginia Medical Journal, for the month above indicated, Dr. R. W. P'Anson, has an article on this subject. In the treatment, he recommends, first, an emetic of salt and water, or ipecacuana, to be repeated as occasion may require, to clear the throat. After the emesis, he would move the bowels with oil and turpentine, and subsequently keep them open with rhubarb, should medicine be required for this end. "A stimulating and supporting plan of treatment should now be adopted, such as camphor and quinine—1 to 5 grains each." * * * "Capsicum, used in
combination with the powder of camphor and quinine, will be found an excellent remedy.” In cases complicated with pneumonia, “the main reliance must be placed in repeated blistering, both in front and behind the chest. At this stage great advantage will be derived from the use of spirits of turpentine, together with stimulating expectorants, as decoction of seneca and syrup of squills.”

As local remedies, he recommends nitrate of silver, 20 gr. to the ounce of water, to be applied only once a day. We have ordered a saturated solution of common salt to be thus used, and to be repeated every hour or two, wish decided relief. It clears the mouth and throat of the adhesive and nauseous secretion better than anything else we have tried. After the removal of the diphtheritic membrane with a strong solution of nitrate of silver, the salt and water, thus applied, will prevent any extensive subsequent formation. In pneumatic complications, he would advise mercury until the gums become tender.

He says he has treated over thirty cases, with but two deaths. We should consider the mercurials objectionable, but then his experience is satisfactory. He says nothing of whisky as a stimulant. In our experience, as has been stated in former summaries, we have regarded it of the first importance. In about twenty cases, we have had two deaths, and both of these refused the stimulant. All the others expressed a confidence that the milk punch or egg-nogg was staying them up against the excessive feeling of prostration.

In the Berkshire Medical Journal, for January, Prof. Wm. H. Thayer has an article of thirty-eight pages upon this subject. He shows a thorough acquaintance with the literature of diphtheria, and enters quite fully into its history. We shall deal only with his treatment, which is not dissimilar from that previously advised by other writers. He says, “Diphtheria is clearly not a self-limited disease; and in order to make treatment effectual, it must be begun at an early period.” Of local means, he gives his preference to the nitrate of silver, and that in nearly or quite full strength. “I prefer to apply the stick to the exudation, and a solution of 2 dr. to 1 oz. to the surrounding mucous membrane for the early applications, to be omitted or diminished as the disease begins to yield.” A variety of chlorinated mixtures are spoken of, as adapted to the milder cases, or the convalescing stages. Of general treatment, muriated tincture of iron, chlorate of potash, quinine, turpentine, and alcoholic stimulants, are recommended. “Chlorate of potash has an advantage over
the tincture of the sesquichloride of iron, as an alkali—in its resolvent effect on the fibrin of the blood, and hence a probability of its diminishing and arresting the exudation.” In our experience, this statement has hardly been borne out. We think we have seen the most positive results from the tincture of iron. “Besides quinine, chlorine, or turpentine, diphtheria requires alcoholic stimulants. The flagging powers of life need frequently repeated excitants to sustain them against the steadily depressing influence of the disease.” These, he thinks, can usually be commenced with as early as the second or third day. We have frequently commenced with them on the first manifestation of the disease, and are confident that we have seen those severe neuralgic pains, so common in the outset, yield to a full dose of hot sling. The absence of surface heat he regards as an indication for the commencement of the stimulant, and adds, “but we might, without hesitation, say that the presence of the disease is alone a sufficient indication.”

In one regard Prof. Thayer and Dr. I’Anson are at variance. Prof. Thayer says, “I cannot avoid thinking it especially ill-judged to mercurialize a patient—if wise at any stage—at the somewhat advanced period at which the croupal symptoms usually appear in diphtheria, as the peculiar adynamic condition also is approaching, if not already begun, which must be hastened and aggravated by a mercurial course.” As in typhoid fever, so in diphtheria, he thinks a tongue dry and black requires turpentine, and not calomel. We have used the turpentine in about half of our cases, in all that were protracted, and at any time gave a dry and red, or black tongue, and always with an evidence of improvement.

In an article of twenty pages upon diphtheria, by Dr. C. H. Cleveland, the subject is discussed with some novel views. As his treatment is somewhat different from any previously given, we subjoin it in substance. Dr. Cleveland thinks alkalies are of the first importance, and recommends the bicarbonate of soda, to be given in from one to ten grains, according to the age of the patient, every half hour, or every hour. As a local application, he prefers a strong solution of common salt. We make one quotation: “A gargle, composed of a very strong solution of common table salt, if the pellicle is not yet formed, will produce an osmotic flow of fluids through the epithelium, and thus cause the fauces and throat to be too moist to allow a pellicle to be formed. It taken early in the attack, repeated very often, at the same time that plenty of soda is taken internally, most cases of
Diphtheria will pass off without any appearance of the membranous exudation. Without doubt, by thus preventing the formation of a pellicle, many cases of genuine diphtheria have been made to remain so mild in their action, that even closely observant physicians have been led to suppose the disease was simply an ordinary pharyngitis."

In the Nashville Journal of Medicine and Surgery, for January, Dr. J. C. Calhoun has a short article on this subject. He says that last fall, the disease prevailed in an aggravated form. The first few cases he treated "in the usual manner, with alterative doses of mercury, an occasional emetic, and nitrate of silver to the throat," and all died. (Dr. Calhoun should know that this is not the usual treatment.) "But since we have adopted the following treatment, not a single case has terminated fatally, so far as I have heard:

R.—Two table-spoonsful of fresh tar.
The yolk of an egg.

S. Spread on a piece of coarse cloth, cover it with a piece of old muslin, and apply to the throat. This plaster should be renewed once in eight hours. If the subject is an adult, direct him to use a strong decoction of cayenne as a gargle, every two hours. For children a weaker decoction should be used, and applied to the throat with a mop. This, together with keeping the bowels in a soluble condition, will as certainly cure diphtheria, as quinine will arrest intermittent fever. The efficiency of the above treatment has become so generally known in this locality, that physicians are seldom called to diphtheria patients."

This statement, in our opinion, is quite too sweeping. We are not prepared to believe that an external application to the throat will cure a constitutional disease, of the severity which diphtheria frequently assumes, with that certainty with which quinine will cure an ague!

In the Medical and Surgical Reporter, for January 5th and 12th, Dr. W. Pepper has lectures upon diphtheria. We subjoin the more important points of treatment. "I am in the habit of prescribing the muriated tincture of iron, in fifteen drop doses, four or five times a day, and sulphate of quinia in doses, so that five or six grains shall be taken in the course of the twenty-four hours. At the same time, to sustain the strength, I give wine and water, wine whey and porter, and when necessary, from the great prostration present, I employ the oil of turpentine, the same as in cases of enteric (typhoid) fever." In regard to the use of mercury, he thinks there are
some cases of a sthenic character that may be benefitted by
the use of mercury, under certain conditions; but in adyna-
nic cases, he thinks there is no doubt of its impropriety. He
also uses the chlorate of potash. As to local remedies, he
thinks powdered alum, or borax and sugar, preferable to
nitrate of silver in substance. He thinks there are many
cases, the local symptoms of which might have remained
mild, but for an aggravation by the use of the nitrate of silver.
He occasionally uses the nitrate of silver, but in weak solution
—under twenty grains to the ounce. Where emetics are
indicated, he prefers alum with ipecacuanha.

In the St. Louis Medical and Surgical Journal, for January,
Dr. S. T. Newman has an article upon diphtheria. He con-
cludes his paper with a letter from Dr. J. W. Bright, of
Lexington, Ky., in which a slight modification from the or-
dinary treatment is advised. Dr. Bright commences the
treatment with a gentle purgative, and afterwards the bowels
are kept soluble by means of oil and turpentine. The mem-
branous exudation he removes with a fine sponge, and applies
a solution of nitrate of silver, 50 grs. to the $\frac{1}{2}$, or the sulphate
of copper, $\frac{1}{2}$j. to $\frac{1}{2}$j. of water, once a day. For general treat-
ment: "I give the muriate of ammonia in full doses, say, to
a child eight years old and upward, 10 grains every two
hours (in solution), and ten drops of the sesquichloride of
iron in the intermediate hours; and these are not to be
omitted for thirty-six hours; then rest four or five hours, and
again give them in like manner. Continue this treatment for
four or five days, according to circumstances." * * *
"The cure should be completed by the use of tonics; I have
found beeberine the best. Diet nourishing. I have treated
three hundred and thirty-four cases after this method, without
the loss of one." The result is quite satisfactory.

In the American Medical Times, for January 19th, Dr. E.
W. Spafford has a short article upon the treatment of diph-
theria. He says, "I have lost none to whom I was called
within forty-eight hours after the attack. My first business is
(if it has not been done) to relieve the stomach and bowels of
their morbid contents by the use of a gentle cathartic; apply
tr. iodine to the neck, three times per day, and with a sponge
probang, alternately apply a solution of chlorate of potash and
nitrate of silver to the ulcers in the throat; sponge the body
with diluted nitro-muriatic acid; give gum water, beef-tea,
wine, quinine and iron, as the case may require. Tonics are
indispensable. If neglected or too sparingly used, alarming
debility may ensue, the surface of the body become colorless,
muscular power in a very short time lost, and the patient soon ceases to breathe.

"I have been much gratified at the beneficial results growing out of the use of nitro-muriatic acid to the surface. It not only acts as a counter-irritant, but as a tonic. Where I have had opportunity to use it early in the disease, I have not witnessed the debility, the flabby, soft condition of the muscles, or colliquative sweats, which so often lead us to an unfavorable prognosis."

In the American Medical Times, for January 26th, Dr. Jonathan Kneeland has an article upon this subject. In Onondaga and vicinity diphtheria has prevailed somewhat as an epidemic since July last. About eighty cases have occurred, and ten deaths. Of these eighty cases, Dr. Kneeland has treated seventeen, all of which have recovered. We shall make a few extracts from his treatment, and thus give what is peculiar. "In giving briefly the treatment I found most successful, I would claim no other merit but that of having somewhat early learned that we must at the onset sustain our patients by specific constitutional remedies, and not rely too much on local treatment."

The bowels were first emptied, in Dr. Kneeland's course, and then the patient put directly upon the chlorine mixture:

``
R.—Chlorate of potash, 5ij.
Hydrochloric acid (dil.) 5ij.
Water, 5vij.
``

sweetened to the taste, giving from a dessert-spoonful to a large spoonful, according to the age of the patient." To this a small amount of morphine was added in some cases; and if muriated tincture of iron was considered advisable, it was given in connection with this mixture, in which connection he thinks it is better borne than when given alone. Quinine, in large doses, he considers all-important: "In no disease have I seen quinine so well borne." Like almost every observer, Dr. Kneeland found "good broths and food of easy assimilative capacity are of essential service. He says, "I have found nitro-muriatic acid (equal parts of each acid), given in doses of six or eight drops in water, and taken after food, well borne in some patients, who did not bear either the iron or chlorine mixture well." * * "Alcoholic drinks in aid of quinine, general stimulants and nourishing broths, seemed useful in some cases. But in some, we found that the free use of 'good sound cider,' as the farmers call it, agreed better than ardent spirits." We have more confidence in ap-
propriate stimulants than anything else in diphtheria. Upon this subject we have frequently expressed our opinion. A few days since, a gentleman called upon us for advice, in regard to a sore throat and general prostration of the system. On examination, we found the fauces soft, palate and roof of the mouth presenting that erysipelasous redness peculiar to the first stage of diphtheria. His business was such as to render it important that he should keep about. I advised him to use all the rye whisky that he could and not become intoxicated; also, to use a saturated solution of potash as a mouth wash and gargle to the throat. We should have said that his tongue was swollen, so as to leave the prints of every tooth upon it, and was heavily furred, and ulcerations had appeared at various points. My directions were adhered to; a pint and a half of whisky was used daily, and the patient recovered without taking his bed at all. In regard to hard cider, we have seen many cases of typhoid fever, in which this stimulant has been almost irresistibly craved; in such cases, we have always gratified the desire, and good has always resulted from it.

As an article of diet, Dr. Kneeland recommends the following: "As an article of diet, remedial, and yet palatable, I would recommend, where they can be obtained, sour-baked apples, mixing the tender pulp with sugar, or giving them alone, if the patient so prefers them. For many years I have used apples in this way as the diet par excellence in scarlatina; and how many grateful little ones, nauseated with pap, porridge and panada, have risen up to call me blessed, for the grateful change to the apple diet!"

As a local treatment, he has no very high opinion of nitrate of silver; "To prevent the secretion from forming after removal (as it often does), I would use tannin and dried alum, applied with a soft linen rag, or on the moistened finger, to parts within reach, and blown into the throat through an ivory or glass tube; or two or three quills introduced into each other answer a good purpose; no harm follows inhaling this powder, as a short paroxysm of cough clears all out again."

The pulverized burnt alum we first saw recommended in the N. O. Medical and Surgical Journal, by Dr. Bigelow, then of Paris. We have used it often, and with satisfactory results. We prefer it to nitrate of silver. For a gargle, the following is my preference, after trying a variety:
R.—Hyd. chlo, ammoniæ, 5ij.
Sódæ muriat., 5iv.
Pulv. capsici, 5ij.
Vinegar, 5ij.

And one and a half pints hot water; cool, and use freely. If any is swallowed, no harm follows.”

The views, of Dr. Kneeland, in regard to treatment, correspond very well with our own; we conclude with the following paragraph in regard to its nature: "From what I can gather from the recorded or narrated knowledge of others, and my own knowledge of the disease as gleaned from a limited number of cases, I have concluded that diphtheria is a blood-changing disease, and that lesion of function in the spinal nerves occurs early in grave cases; that we would not wait for sinking, but, if possible, anticipate and prevent it; and, finally, that to oxygenate the blood, and rouse and vitalize the nervous system, are the leading indications to be sought.”—American Medical Monthly.

Strangulated Hernia.—Chloroform.—Unless chloroform be given to a very free extent, it does not produce perfect relaxation of spasmodically contracted muscle, hence in cases of strangulated hernia it must be given so as to produce a perfect state of comia, as indicated by stertor. If this be produced there are but few cases of inguinal hernia which will not yield to efforts at reduction, if the case is seen sufficiently early. Success to the same extent cannot be hoped for ingemoral hernia, as statistics show that this form of herni requires operation 25 per cent. more frequently than inguinal.—Mr. T. Byraat, p. 167.

Incontinence of Urine.—In a boy of fourteen, give one-third of a grain of extract of belladonna twice a day in cinnamon-water, in those cases where the affection is suspected to arise from weakness or paralysis of the sphincter of the bladder. Belladonna acts by toning or exciting the ganglionic system, and depressing the cerebro-spinal system.—Dr. R. Hughes, p. 395.
EDITORIAL AND MISCELLANEOUS.

OUR PRESENT NUMBER.

We call attention to the original department of our present issue. The three short articles here presented are, each, of much practical value to the physician. The paper on Tape Worm presents the details of a case by a most intelligent patient and his observations, though not those of a medical man, will be found suggestive and practical. Turpentine, it is well known, has been long regarded as among our most valuable anthelmintics, but heretofore, it has been thought more particularly adapted to the lumbricoid form of parasites—the experience of the two cases reported in our present number, certainly appears to admit its claim as no less reliable in Tape Worm. The mode of its administration should be well considered and followed by any of our readers who may wish to apply the remedy in a similar case.

Dr. Bellinger's paper, on the Diagnosis of Early Pregnancy by Rectal Touch, presents many points of originality and practical value. It cannot be denied that our means of the certain diagnosis of early pregnancy are deficient and though Rectal Touch may not present an unquestionable criterion, still we are disposed to give great credit to any extension of our means of determining a matter, often, of so much importance. Dr. Bellinger deserves the thanks of the profession for this valuable contribution.

No less valuable than the two foregoing is the communication of Dr. Horace Neeson, on Dislocations of the Hip Joint. We forbear extended observation on his views, in this place, as we have already discussed their merits in our introductory remarks heading the paper.

We again earnestly call on our correspondents for contributions. No scientific work can be supported and kept valuable except by the joint labors of both its readers and editors. The South is teeming with knowledge and experience of the most valuable and practical kind. It requires but little industry and self-sacrifice to place all this before the profession and to render what is now but "the property of a few, attainable by all." We say, then, to our readers, still let the Southern Medi-
cral and Surgical Journal remain, as it has ever been, an object of interest to all sections, if not for the spirit and vigor of its editorial disquisitions, at least because it furnishes fully and fairly its own quota of experience to the general fund of American Medicine.

Hypodermic Injections of Atropine and Cutaneous Revulsions in Sciatica.—Hypodermic injections with narcotic fluids do not, as might have been expected, relieve pain in all cases of neuralgia. When the symptoms remain unaltered after such injections, various therapeutic resources are left; and it would appear—in sciatica, for instance—that linear cauterizations with sulphuric acid along the course of the nerve may prove very efficacious. This was lately proved by M. Legroux, physician to the Hotel Dieu of Paris, in two cases. Both patients were men, aged 35 years. Injections of sulphate of atropine, one grain to one hundred of water, did not remove the pain, though giving rise to symptoms of Belladonna poisoning. Sulphuric acid was now applied by means of a brush rapidly carried from the origin of the sciatic nerve to the ham, the skin being thus cauterized in a linear direction. The severe pain caused by the acid not did last long; and the neuralgia gradually diminished. In the two cases alluded to, several operations were necessary; but the complaint was completely subdued in a few days.—London Lancet.

Obstinate Neuralgia.—Electricity.—It is well known that if an intense current of electricity be applied in the course of a nerve, its sensory power is benumbed for a time, and the same result follows if the nerve is the seat of neuralgic pain. After a time the pain returns, but on repeating the electrification the recurrence each time at longer and longer intervals, until finally a cure is effected. Sciatica, lumbar, intercostal, crural, and trigeminal neuralgia may be thus treated successfully. Nineteen cases of sciatica, many of them old standing and obstinate cases have been cured by this plan of treatment.—M. Becquerel, p. 40.

Atropine—Strength of Solution used.—When it is wished to dilate the pupil for ophthalmoscopic investigation, the strength of the solution used should not be more than half a grain of the sulphate to an ounce of water. This will suffice for the purpose, and the unpleasant effects of a stronger solution will be avoided.—Mr. H. Walton, p. 218.

Vaginitis.—Tannin Ointment.—In cases of simple vaginitis, or superficial inflammation of the neck of the uterus, an excellent local application is an ointment composed of tannin and lard. This may be smeared over a piece of wadding and introduced through a speculum, a thread being attached to it, so that the patient can remove it herself. This does not supersede the use of constitutional remedies as well.—Dr. Foucher, p. 264.
**Tetanus.—Aconite.**—It is worth while to try the affect of aconite in tetanus, as from some cases related its employment seems to have been followed by some amelioration of the symptoms. In one case five minims of the tincture were given every two hours at first, then increased to eight minims. The improvements in the symptoms dated from the employment of the aconite. The patient was well sustained by beef-tea and brandy. This remedy must be administered very cautiously, however, as though it certainly is a powerful nerving sedative, it acts much more powerfully on the heart. Death from aconite usually occurs from syncope. It is cumulative in its action.—*Ed. Lancet*, p. 45.

**Profuse Menstruation—Quinine.**—The periodicity of the menstrual process is to be referred for its cause to the ganglionic system of nerves. There is considerable analogy between each individual menstrual flow and an attack of ague. Now, when the process occurs too frequently, every fortnight or three weeks, it may generally be controlled by quinine (unless owing to severe inflammation of the neck of the womb). The quinine may be given in doses of two or three grains every night or every other night, and if nervous symptoms predominate, it may be combined with sedatives, or if anaemia is present, with iron.—*Dr. F. J. Tilt*, p. 286.

**Pulmonary Hemorrhage.**—In the intercurrent haemoptysis of phthisis, the tincture of larch-bark, in doses of half-a-drachm to a drachm every second or third hour is a very effectual remedy, succeeding in some cases when the usual remedies (ippecacuanha, lead, tannin, and gallic acid) had failed. It is now the remedy principally used in these cases, in the wards of St. Vincent's Hospital.

**Flooding after Delivery.**—Inject about half a pint of very cold water (iced if it can be obtained) into the rectum; at the same time give cold brandy and water, with one drachm of Curtis's liquor secali cornuti in it.—*Mr. P. Hubbert*, p. 244.

Larch Bark is also recommended in cases of purpura, haematuria, and metorrhagia. The tincture may now be obtained of most respectable chemists.—*Dr. J. M. O'Ferrall*, p. 77.

"**Solution of Gold in the Body.**—By T. Wordsworth Poole, M. D.—Having known considerable anxiety caused by the swallowing of pieces of dentists' gold plates, I was led to make a few trials on animals with solid mercury and diluted sulphuric acid, given some time after the gold was swallowed. The gold was rendered brittle and partly dissolved in the mercury, and the animals seemed to suffer no bad consequences. I hope that by your permitting this suggestion to appear in the *Lancet* some one of more experience may undertake the matter, and form a determinate method of treatment."