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"Je prends le bien où je le trouve."

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ARTICLE I.

On the Treatment of the Tertiary Symptoms of Syphilis by Hydriodate of Potash, with Cases. By Paul F. Eve, M. D., Professor of Surgery in the Medical College of Georgia.

It is not my intention, in the present article, to enter upon the subject of the venereal disease further than, to exhibit the speedy and potent effects which the combination of Iodine and Potash has over its last or third order of symptoms.

It is known to the profession, that within a few years, an effort has been made, particularly by M. Ricord of the Venereal Hospital of Paris, to divide the constitutional symptoms of Syphilis into secondary and tertiary. The following classification of the phenomena of this disease, according to its pathology, appears now to be gaining favor with the best informed physicians:

The venereal disease employed as a generic term, embraces two distinct species—viz: Gonorrhœa and Syphilis. These do not depend upon the same virus. Gonorrhœa has probably prevailed from time immemorial, and is not accompanied with peculiar constitutional symptoms. Syphilis was first observed about the close of the 15th century, and if not aborted by treatment, almost invariably infects the system, and becomes a constitutional disease. Both, however, are contagious, and propagated in the same manner, (by the promiscuous intercourse of the sexes,) and both may exist simultaneously in the same person. One is generally confined to the mucous surfaces...
of the genital organs; the other, though local at first, soon extends to nearly all the tissues of the body.

The primary symptoms of syphilis, are chancres and buboes. The matter or pus produced in these is contagious, and will transmit the same disease by inoculation. This virus may be destroyed, by caustic, (for example,) if applied within five days from the appearance of a chancre, and then no general or constitutional effects are likely to occur.*

When a bubo is the first symptom discovered, it is supposed to be dependent upon a previously existing but concealed chancre; and it will communicate syphilis, if it be genuine. Buboes may, and often do arise sympathetical or symptomatical of other diseases; but then they contain no virus, and attempts at inoculation fail.

The secondary symptoms of syphilis appear on the mucous membrane and skin, as the ulcerated sore throat, and lenticular eruption upon the surface of the body—some add alopecia, or falling of the hair, and condylomata, or tubercles about the anus and genital organs. These result from the absorption of the syphilitic virus, and are the first series of constitutional infection. They generally appear about four or six weeks after the existence of the primary symptoms. The disease cannot be communicated by any secretion taken from the second class of symptoms; but though non-contagious, still it is hereditary, descending through parents to children.

The tertiary phenomena, or third class of symptoms of syphilis, exhibit themselves in the shape of nodes, deep-seated tubercles, warts on the genitals, chronic ulcerations of the throat, rhagades or eruptions in the hands and feet, ulcerations of the nose or about the face, horny excrescences, &c. Although the system is more profoundly affected, yet the disease in these forms is neither contagious nor transmissible by inheritance. These symptoms never occur without being preceded by the primary and secondary, and seldom appear before these have existed for some six or eight months, and sometimes not until years afterwards.

To recapitulate.—1st, the primary symptoms of syphilis, chancres and buboes are contagious; 2nd, the secondary, sore throat, blotches, &c., are hereditary, but non-contagious; 3rd, the tertiary, nodes, chronic ulcerations, &c., are neither contagious nor hereditary.

* The prophylatic soap of Dr. Pfeffer used with success in St. Petersburg, contains in 500 grains of the substance, 6 grs. of bichloride of mercury, 4 of tannin, and 45 of chloride of lime, incorporated into a soap with soda. In its application, some difficulty, of course, is experienced in the female.
Not only in a diagnostical point of view, is this classification of the phenomena of syphilis important, but we shall find it equally so in a therapeutical. If nature has been followed in the description of the symptoms, and the changes from a healthy to an abnormal condition defined in the order of their appearance, we are surely in the right path to correct this state. Phenomena differing so widely as do the primary and secondary symptoms of the disease under consideration, have always been admitted to require modifications in the modes of treatment, and so indeed must it necessarily be with the tertiary. The discrepancy in reference to the best plan of curing the constitutional symptoms of syphilis, may be explained by the want of discrimination in the general classification of all these phenomena under the head of secondary. It is only during the past few years that another division has been insisted upon, and a third order attempted to be established.

Nodes, exostoses, caries of the bones, chronic ulcerations of the mucous membrane and skin, tubercles, &c., have co-existed with other symptoms of syphilis, and have all, until recently, been subjected to the same treatment. So indiscriminately was mercury employed in this disease, that the question arose, whether these very phenomena were not the sole effects of the remedy itself. In his system of clinical medicine, published in 1843, Dr. Graves, of Dublin, remarks on this subject, "notwithstanding all that has been said and done, a good deal still remains to be accomplished, before the treatment of syphilis can be said to be placed on a solid and rational basis. * * * In treating cases of primary or secondary symptoms, which have existed for some time, and where the patient has been taking mercury, it is hard to unravel the perplexities which surround the case, and ascertain whether the mercury has been properly administered or not.

"Where a patient laboring under syphilis has been salivated without being improved, one of two things must be inferred—either that the mineral has had no effect on the disease, or that it had an injurious effect on the constitution. The great point to arrive at in the treatment of syphilis, is to make the mercury act on the disease, and not on the constitution. This I have often endeavored to impress on my class. I will venture to say, that I would engage to give a patient, laboring under primary symptoms, any quantity of mercury, without producing a favorable effect on the disease, or doing him any good. I would engage to salivate a man affected with sore throat,
and yet leave him as bad, or even worse than ever. I have witnessed this occurrence over and over again, and have laid it down to myself as a proposition—that the venereal may be treated with mercury, to the fullest extent, without being cured.”

Of the opposite plan of treating syphilis, i.e., the non-mercurial, it is known that a good deal was said and published, especially by some of the army surgeons of Europe, fifteen or twenty years ago. But the very favorable statistical reports then made, have not been sustained by subsequent observations and experience; it is even said, that Mr. Rose, formerly one of the most zealous advocates of the non-mercurial plan, has not only abandoned it, but adopted the mercurial course of treatment.

With regard to the propriety of insisting upon the classification of the symptoms of syphilis, advocated by this article, it may be remarked that John Hunter divided the parts affected by the secondary symptoms, into two orders, and these included the second and third class of M. Ricord. In the edition of his work on the Venereal, edited by Babington, (1839,) he says, the first symptoms of the disease, after absorption, appear either on the skin, throat, or mouth; and again, in the second stage of Lues Venerea, in the deeper-seated parts, as the periosteum, tendons, fasciae and ligaments. He also distinctly states the order in which these parts are affected—viz: 1st, the mucous membrane and skin, and 2nd, the internal or deep-seated organs. We may also observe, that Samuel Cooper, and others, often allude to, and speak of the secondary venereal ulcerations. Still, with scarcely an exception, their countrymen, even to the present day, admit but the two classes, the primary and secondary; we are therefore, compelled to request the reader to make the distinction, when we refer to writers in Great Britain on this subject. By the term secondary symptoms, they include all those which occur after chancres and buboes, while the French divide them into secondary and tertiary.

Of the recent contributions of chemistry, none seem to promise more in the practice of medicine than the preparations of iodine; and of these, one of the most valuable is certainly the hydriodate of potash. Its synonyms are potassii iodidum, potasse hydriodas, iodide of potassium, proto-ioduret de potassium, hydriodate of potassa or potash. Its medical properties and uses have not yet been fully ascertained. Even its dose is not satisfactorily defined; for while some give only a few grains, others have ventured to administer half
an ounce of the pure salt. It is generally considered to be diuretic, alterative, resolvent, and deobstruent.

The introduction of this article into the treatment of syphilis, may be learnt from the following extract of a report on the subject, made by M. Rattier’s on M. Ricord’s practice:—In our researches on the administration of the ioduret of potassium, we have been able to follow out the treatment of all the various forms of tertiary syphilis. Often the ioduret alone has been found sufficient for the cure; but whenever any complication has happened to be present, it has received an appropriate medication. By having recourse at one time to tonics and stimulants, at another time to antiphlogistics, M. Ricord combines the various resources of therapeutics, according to the circumstances of each case; and in some patients who, in consequence of successive infections, have exhibited the disease in all its stages—primary, secondary, and tertiary—a local treatment has been directed to the chancres, the use of mercury (proto-iodide) has caused the secondary symptoms to disappear, and the hydriodate of potash has been equally successful against the tertiary symptoms. Such is the basis of M. Ricord’s treatment. If those principles, now explained, be not attended to, the physician will be apt to commit many serious errors; of which we meet with numerous examples in the assertions of those writers who have attempted to disparage the utility of the ioduret of potassium, on the ground that they have observed certain secondary symptoms resist its administration. Had a few mercurial pills been exhibited at the same time, these symptoms would speedily have vanished. In conclusion, the proto-ioduret of potass- sium amply deserves, in the treatment of tertiary syphilitic symptoms, all the praise which mercury is entitled to in the treatment of the secondary symptoms—with this difference, that, very seldom, or never, has it given rise to those numerous and distressing accidents which are too well known to have been frequently induced by the injudicious administration of its rival. (La Lancette Française—Medico-Chirurg. Review.)

M. Ricord, in his practice, commences with 10 grs. a-day of the iodide of potash, in some convenient vehicle, as the decoction of hops, &c., and increases the dose every third or fifth day, until it amounts to 36 grs. during the twenty-four hours. He has administered as much as 3 ii. a day; but thus given, it is apt to produce the iodic intoxication, a certain nervous tremor of the muscles with confusion of the brain.
Cullerier's prescription is 1. Iodine, gr. 1; Potassæ Iodid., ii. ad iv.; Aquæ, ʒi. M. This is put into a pint or quart of decoction of sarsaparilla, and is to be given at intervals during the day. The dose of iodine may be increased to 2 grs., and that of the iodide of potass to 6 or 10 in the day.

The Reviewer, in the Medico-Chirurgical Journal, 1840, says that, in the mixed symptoms of cachexia, (resulting from syphilis,) the preparations of iodine act almost marvellously. In the rubial or ecchymatous ulcerations of the skin, in diseases of the bones that sometimes may result from syphilis, and often do result from mercury, the iodide of potassium is highly beneficial; yet he adds, it seems inconsistent and uncertain in its operations.

While we admit that preparations of mercury do oftener, more speedily, and with more certainty and permanency, cure confirmed secondary symptoms of syphilis than any other plan yet adopted, still, in the tertiary forms of this disease, its rival, iodide of potash, has decided preference. The late M. Biet, whose extensive opportunities at the St. Louis Hospital, in Paris, entitle his opinion on this subject to some respect and weight, stated "that mercury did not produce any marked effect over the syphilitic tubercula." Samuel Cooper, Prof. of Surgery in the London University College, says, "I doubt whether secondary symptoms are more frequent after the treatment of primary sores with iodide of potash and sarsaparilla, than after mercurial treatment." James Miller, Prof. of Surgery in the University of Edinburgh, in his Principles of Surgery, observes on Diseases of Bones, "but, as a general rule, mercury, in any form, is never to be given in periostitis, more especially so as to produce a constitutional effect, unless other and safer means have proved unavailing. For that mineral we well know to be as likely to cause as to cure." He gives the preference to the iodide of potassium. "Dr. Williams, of London, considers it (hydriodate of potassa) applicable to the treatment of various forms of secondary syphilis. He used it with success, in a majority of cases, in removing hard periostal nodes, and found it beneficial in the treatment of tubercular forms of venereal eruptions. It is also considered as one of the best alterative remedies in mercurio-syphilitic sore throat." Mr. S. Cooper not only doubts which is the best mode of treatment for primary sores—the mercurial or iodide of potass, with sarsaparilla—but he is a strenuous advocate for the use of the latter in the various secondary and tertiary venereal affections. He recommends its employment
in the eruptive form, in nodes, phagedenic ulcers, &c., and these belong to the tertiary division. He generally gives from 3 to 5 grs. of iodide of potassium in decoction of sarsaparilla thrice a day. In Liston's Elements of Surgery, edited by Prof. Gross, of Kentucky, the latter says in a note, "it is surprising that the author has made no mention, in connection with this subject, (constitutional symptoms of syphilis,) of the iodide of potassium, so justly lauded by Mons. Ricord and some other French surgeons. For the last two years, or more, I have been constantly in the habit of employing this article in tertiary syphilis, in mercurial diseases of the bones, and in chronic rheumatism, in which, I am convinced, it is as much of a specific as quinine is in intermittent and miasmatic neuralgia." Dr. G. gives the article in large doses, even half a drachm, after having commenced with 10 grs. three or four times a day. He adds, "patients who have labored under nodes and nocturnal pains for months, whose health has become greatly impaired, and who have not slept soundly perhaps for weeks together, have often perfectly recovered under this treatment in less than a fortnight." In the Bulletin of General Therapeutics, of last year, is an article from M. Ricord, on what he terms Syphilitic Chlorosis. He states that, in his examinations of the blood taken from patients laboring under syphilis, he has found a diminution in its globules; a condition which obtains in common chlorosis. This particular state of the blood grows worse as the syphilitic infection gives place to secondary or tertiary symptoms. It may continue in different degrees after they disappear. The first conclusion to be drawn from these considerations is, that syphilis being an anemic disease, or, at least, always complicated with anemia, the antiphlogistic method of treatment is dangerous. The second conclusion is, the necessity of a nutritious diet. "The treatment that I adopt," says M. R., "consists in the combination of ferruginous and mercurial preparations, if there exist no counter-indications. When the secondary symptoms pass to tertiary, the mercurials, combined with iodide of iron, or with iodide of potassium, suffice to reconstitute the blood."

In Braithwaite's Retrospect for July to January, 1845, No. 10, may be found an article by Dr. Skae, taken from the Northern Journal of Medicine, on Condyloma. This writer refers to the Lectures of the late Dr. Wallace, of Dublin, as published in the London Lancet, who gave the name of "exanthematic primary syphilis, to the group of symptoms consisting of moist elevated patches upon the
mucous membrane of the lips, cheeks, tonsils, &c., of a whitish color, as if touched with nitrate of silver, or coated with milk, mucous tubercles about the genital organs or anus, &c.; and which are associated with the eruption on the skin. Dr. Skae says, these are curable without the use of mercury. "My treatment consisted chiefly in the application of stimulants to the condylomata; the use of astringent injections and cold washing, for the cure of the vaginal and uterine discharges; and in cases of the latter kind, the internal administration of tinct. of cantharides. In several cases, when there existed cutaneous eruptions, the iodide of potassium was given. In no instance was any mercury administered, except in the case of the woman affected with iritis." For the treatment of these symptoms, which are now classed under the head of tertiary, in the September No. (1844) of the London and Edinburgh Monthly Journal of Medical Science, Dr. Rose Cormack writes, "besides corrosive sublimate, (which he recommends in repeated small doses, largely diluted,) there are several valuable therapeutic agents, which may be given internally in the treatment of condyloma. As the chief of these, I would mention hydriodate of potash. * * * I generally prescribe three grains of the hydriodate of potash to be taken in twenty-four hours, in four or six doses, each being dissolved in several ounces of water, with or without infusion of gentian." He also recommends in syphilitic skin diseases, after repeated small bleedings, the hydriodate of potash. He says it was first employed in secondary and tertiary syphilis, by Brera, in 1821; and his example has since been followed by very many, among whom deserve special notice, Ricord, Biett, Baumés, Wallace, Sperine, (of Turin,) Schultzemberger, (of Strasbourg,) and Guétine, (of Antwerp). In the hands of these physicians, he adds, it seems to have cured every form of secondary and tertiary venereal disease.

We give the following extract, as it bears so forcibly in favor of our position:

The report, which M. Gauthier has recently published respecting the curative power of this salt of Iodine in secondary and tertiary syphilitic affections, is on the whole highly favorable to its use. He has administered it in a vast number of cases, and has rarely noticed any injurious or even unpleasant effects fairly attributable to its operation. On a few occasions it appeared to cause a salivation; which, however, speedily ceased. Now and then, an innocuous exanthem made its appearance on the surface. In some persons it causes slight gastric irritation; but in most, the digestive functions
appear to be decidedly improved under its use. In no instance has
any wasting of the body seemed to be induced by it, as has occa-
sionally been observed with respect to Iodine. One of the most
constant effects of the Ioduret is to increase the flow of the urine.
It seems to pass very rapidly into this and the other secretions; its
presence is readily discoverable by its well-known appropriate tests.
M. Gauthier has often detected it in the saliva.

The following are the forms of the syphilitic disease in which he
has witnessed the most decided curative effects. Pains of the bones,
even when most severe, are often very rapidly and effectually subdued; nay, when caries exist, a salutary change is not unfrequently
obtained. Thus in Ozœna, complicated with disease of the palate,
or nasal bones, we seldom fail in greatly benefiting, if not in curing,
the disease. In various tubercular affections of the skin and mucous
membranes, the Ioduret will be found most useful. Deep ulcerations
of the throat and pharynx, rhagades or fissures about the anus and
nails, will not unfrequently heal up most satisfactorily, even when
mercury has been previously tried and failed. It is sometimes truly
marvellous to witness the decided improvement of the general health
in the course of a few days, under the use of the Ioduret when judi-
ciously administered. M. Gauthier considers that it is a most valu-
able remedy in many cases of mercurial cachexy: an ioduretted
gargle will often serve to check salivation from this cause.

He invariably begins its administration in small doses—from two
to four grains, or even less twice a day. The quantity should be
doubled every third or fourth day, until it reaches 15 or 20 grains.
This dose should be continued for some time; but, if it fails in pro-
ducing any decided effect upon the disease, it may be increased to
two scruples or even a drachm. In a few cases, he has given as
much as two drachms in the course of twenty-four hours.

A solution of the Ioduret in water, to which some tincture of
Iodine has been added, may be advantageously used as a gargle in
ulcerated sore-throat, and as a wash to ulcers on the surface, or on
the Schneiderian membrane.

The average period, during which the internal use of the Ioduret
should be continued, may be stated to be from six to eight weeks.
Much will depend on the gradual increase of the doses given. Many
cases will remain stationary, if the quantity of the salt administered
be not progressively—and this, too, rapidly—augmented.—Med.
Chir. Rev., from Observations pratiques sur le Traitément des Mal-
adies Syphilitiques par l'Iodine de Potassium, by M. L. Gauthier.

In the General Bulletin of Therapeutics, for January, 1845, will
be found an article on the efficacy of corrosive sublimate in the treat-
ment of the secondary and tertiary symptoms of syphilis, by M. A.
Devergie, Physician of St. Louis Hospital. In this is reported an
interesting case of an officer long affected by the disease, and where-
in the iodide of potassium alone, failed to produce a cure. This was finally affected by the combination of the mercurial with the iodide of potash and iron, quinine, &c. In general, M. Devergie's treatment for the secondary and tertiary symptoms of syphilis, is "a quart of sudorific ptisan, in which from 5 to 20 grs. of the ioduret of potash have been dissolved, and also to take every morning, fasting, a pill composed of guiac, opium, and a minute quantity of the corrosive sublimate. In the course of a week or so, a second pill is to be taken at night also. These medicines are to be persevered with for two, or even three months, without intermission. A tepid bath is to be taken once a week."

To that variety of the venereal disease, known as the most intractable and destructive—I mean the constitutional effects of syphilis in a scrofulous diathesis—the iodide of potash seems peculiarly appropriate. Indeed, should this fail to cure, mercury being out of the question, we may try iodide of iron or preparations of arsenic; but fortunately, the hydriodate is usually well adapted to the case.

In the use of the article, we remark a considerable difference in the dose as employed in England and France. While the English recommend it in doses of 3 to 5 grs., the French give 10 to 20 grs. a day. The preparation which I first used was obtained from Pelletier & Berthemot, of Paris. My mode of administration is to put 3i. of the salt into 8 ounces of water, and give a half tea-spoonful three times a day, increasing the dose to a full tea-spoon. This will make from 10 to 20 grs. in twenty-four hours. I have thus directed the hydriodate of potash, in a goodly number of cases in private practice, and in the majority have lost sight of their issue—the result not having been reported. It is well known, that but little that is satisfactory can be derived in the treatment of the venereal disease out of hospitals. Few patients, in private practice, will submit to the diagnostic test by inoculation, and fewer still will make regular reports to the physician or surgeon of their cases. Of those I have treated with the hydriodate of potash, the following three cases have been the most striking, and exemplifies the good effect of the medicine in persons of different age, sex and color:

Case 1. Philip, a black man, aged about 50, has had syphilis for many years. When purchased by his present owner, I was requested to give an opinion as to the state of his health. He was pronounced unsound, and to be then laboring under the tertiary effects of the
venereal disease. This was in the summer of 1843. In May, 1844, he was placed under my care. He was then in a very desperate condition. His master thought his death inevitable, and only expected some mitigation of his suffering. He could scarce articulate so as to be understood; and deglution was affected with great pain. Has had alopecia to some extent. The surface of his body in places, particularly on the forehead and breast, was covered with irregular tubercles, varying in size and shape. The frontal bone exhibited ulcerated nodosities, and the extremity of his nose was greatly enlarged. The whole of the soft palate had been removed by ulceration, and the throat presented one large irregular and offensive ulcer. Philip, it need scarce be said, had been subjected to a variety of treatment, for he was a favorite and valuable servant, being an excellent cook.

I immediately put him upon the hydriodate of potash in 10 grs. doses, in conjunction with sassafras tea, the warm bath and good light nourishing diet, such as he could conveniently swallow. The iodide was ordered to be increased to 12 or 15 grs. three times a day, if the previous doses were tolerated. In ten days the improvement was most gratifying. He took about iii 5 of this preparation during the treatment, and by kind attention and good nursing, perfectly recovered. He married the following winter, and may be now seen almost any day, and in all kinds of weather, driving a market-wagon in our streets. The defect of palate is scarcely detected by his speech.

Case II. This is a mulatto man, aged 40, and a brick layer by trade. He has had the venereal disease several times, the first attack near twenty years ago. He has been for several months under the care of another physician, and been thoroughly treated by the usual method for a chronic sore throat. In November, 1844, I commenced to give him the hydriodate of potash. It was with great difficulty he could swallow the dose of 5 grs. three times a day. In a day or two the soft palate dropped off, the immense ulcer then began to heal, and in less than a month he asked permission to go to work. The quantity of the iodide used in this case was greater than in the first reported, and it had to be continued much longer. He took over iv 5 of the hydriodate, and was under treatment two months. This patient too, had had alopecia and chronic ulcerations upon the skin. In both these cases the iodic intoxication was slightly felt, although the quantity of the preparation never reached 50 grs. in twenty-four hours.
Case III. For the notes of this case, I am indebted to my friend, Mr. Jeter Martin, who has been acting as resident physician to our city hospital during the past summer. This patient, although not cured by the hydriodate of potash, owing, as is believed, to her inability to retain it in sufficient quantity, was nevertheless so strikingly improved by it, and that too in a very short time, and witnessed by a whole class of students in attendance, as to be worthy of notice here.

S. C., aged 17, of luco-phlegmatic temperament, and of small stature, had the misfortune to be attacked in March, 1844, with syphilis. It commenced with chancre, and being in the country, she took no medicine for the disease. In August following, she says she was covered with small yellow blisters, and in six weeks thereafter each blister had become an ulcer, and these in their turn assumed the appearance of small irregular horns.

When she arrived at the hospital, so entirely was she covered with ulcerations, that she would allow no one to assist her in moving, for fear of increasing her pain and suffering. On the 29th September she entered under the service of Dr. Garvin. Her forehead presented some five or six excrescences, projecting from half to three-fourths of an inch beyond the skin, but attached to it, (tubercular syphilida,) her elbows and knees were covered with large ulcerations, she had chronic sore throat, &c., &c.

Dr. Garvin first put her upon the blue mass, and directed chloride of soda to the ulcers. This treatment was changed to corrosive sublimate and a wash of decoction of sage, tinct. of myrrh, borax and honey. This preparation of mercury affected the bowels and had to be discontinued, and the iodide of mercury was substituted for it; the ulcers were then dressed with calomel 13 and simple cerate 13. She also took some quinine. This was the treatment pursued up to December 1st, and under which she had somewhat improved.

So evident were her chlorotic symptoms, that upon entering this month on duty at the hospital, I first prescribed the iodide of iron in simple syrup three times a day in 3 grs. doses. December 3d, the hydriodate of potash was given in the same doses, as the iodide of iron is not retained upon the stomach. December 8th, the hydriodate is increased in quantity; and on the 15th, she takes 25 grs. per twenty-four hours. Up to the 15th January, 1845, this treatment was perseveringly attempted to be continued, but no effort could succeed in getting a larger quantity of this medicine into her system. Indeed, it had frequently to be interrupted on account of the irrita-
bility of her stomach. Still her improvement was such, that her ulcers almost entirely healed up, her horny excrescences ceased to be reproduced, her throat appeared healed, she gained much flesh, and left her bed to take regular daily exercise.

ARTICLE II.

Case of Fungus Hæmatodes. By Gilbert H. Wootten, M. D., of Florence, Ga.

The extreme infrequency of such cases in the United States, induces me to prepare this brief history of one that partly came under my management. The patient, the Rev. David Cox, aged about 40, of leuco-phlegmatic temperament, was attacked some time in the year 1840, by the disease in question. The tumor formed about midway between the trochanter major and the knee, on the external part of the thigh. In its formation it presented the usual characteristics of fungus hæmatodes, and was developed quite rapidly to the size of a cocoa nut. At this juncture Mr. Cox, acting under the advice of a gentleman of this county, (Stewart) who practices medicine, submitted to an operation. The wound healed kindly, but the tumor re-appeared very soon, at the place from which it was excised, and on the 1st of June, 1844, about six months subsequent to the operation, had attained to about its original size. Up to this time, I am indebted to the family for the details of the case. Dr. Strawn, my co-partner, and myself, were now consulted, and requested to take control of the case. The patient was importunate for a second operation, which we discouraged, and declined performing, for the following reasons: 1st, we regarded the disease as constitutional, and not local; 2nd, there were few, if any cases recorded, of success by an operation; 3rd, the previous operation had not only failed, but had evidently augmented the rapidity and violence of its formation; 4th, the system gave evidence of participation, by the intensely inflamed, and very much enlarged condition of the inguinal glands. Had we have seen the case previous to the condition of our "4th reason," we might have counselled as the only prospect of success—amputation of the thigh. Would it have been good practice?

The tumor in the groin (I mean the enlarged gland) continued to
Case of Fungus Hæmatodes. [December,

developed very rapidly and fearfully, and on the 1st of August, there-
after, had acquired the dimensions of a half-bushel measure—the or-
iginal one on the thigh having ceased to grow, remained the size pre-
viously indicated. The inguinal tumor now shot out fungus ex-
crescences, (till its surface was dotted all over,) whose mouth resem-
bled an inverted stocking, and over all its surface the meanderings of
large veins could be distinctly traced. It now bled frequently and
 copiously, owing, as I presume, to the perforation of its vessels by
an ulcerative action. The bleedings were controlled by tamponing
these orifices, and by compression. The odour it emitted was ex-
tremely offensive, rendering the sick chamber a place of absolute
suffering to the attendants and visitors. I should perhaps remark,
that in the progress of this tumor, and before its character was so
well defined, we were frequently importuned by the patient to punc-
ture it, he hoping and believing it to be only an abscess, contrary to
our assurances. We refused to operate, but gave our consent to its
being done, merely to gratify and convince him. We remarked,
however, that it yielded physical indications of distinct fluctuation.
He procured the services of a Botanical physician to open it. Blood
in small quantity was the only result of the puncture. After attain-
ing the dimensions and character before described, sphacelation en-
sued, and the entire tumor sloughed out, leaving a cavity or basin
that would have contained two or more gallons of fluid, with a sub-
tegumentary hollow or channel, communicating with the original
tumor on the thigh. Knowing that Sir Astley Cooper had reported
one case of recovery, by the occurrence of the same process, we en-
tertained some hopes that the sloughing would proceed and eradicate
the original tumor, and thus save our patient. But contrary to our
hopes it did not do so. The patient was now extremely emaciated,
aspect cadaverous, breathing scarcely perceptible, voice entirely inau-
dible, with almost constant sleeping. At this stage, after putting
him under prescriptions, the case, owing to incidental circumstances,
passed to the control of another physician, and was not seen again
by us, until about the middle of November, a period of two months.
When we again visited the patient, he had recovered his strength,
the cavity left by the sloughing of the tumor had filled up kindly,
but on the margin of the cicatrix, six or eight other tumors, about
the size of lemons, had formed. The patient died about the 15th of
December, with rigors. During the progress of the disease, we
frequently interrogated the various organs of the system, to discover,
if possible, whether they had taken on lesions. The most prominent evidences discovered were furnished by the lungs, the spinal column and the rectum. These we briefly mention. The expectoration was profuse, and resembled thick mucus, having a very unpleasant odour. No blood was discovered with it. Hemiplegic paralysis ensued, and there was tenderness upon pressing the vertebrae. This we made no effort to relieve, as it occurred only a few days prior to his demise. The rectum was the seat of excruciating pain, in voiding the faeces, or in the escape of flatus. This we supposed was owing to an inflammatory action, resulting from the contiguity of the tumor. It would seem useless to give in detail the system of medication adopted in the management of this case. Suffice it to say, that we directed opiates in sufficient quantities to lull the suffering; wine and ammonia to support the patient under the sloughing process; elixir vitriol to control the colliquative sweets; saline aperients to keep the bowels gently open; and the pyroligneous acid locally, to correct the fetor of the exhalations. We should perhaps mention the fact, that the patient was also visited occasionally by Dr. Hay, of this county.

ARTICLE III.

Case of Secondary Syphilis. Read before the Georgia Medical Society, December 14th, 1843—By JOHNSTON B. TUFTS, M. D., of Savannah, Ga.

The patient in this instance was a native of Ireland, aged 32 years; a man in good circumstances, but of very intemperate habits; general health not very good, owing, no doubt, to his liberal use of ardent spirits. This individual had contracted a venereal affection some months before he applied to me for advice. For this primary disease, he had been under the hands of two medical gentlemen of this city, who, according to his account, dismissed him as cured. The primary affection seems to have consisted of a large chancre on the glans penis, and a bubo in the right groin. These two, viz., the chancre and the bubo, he states were evidently cured; but upon making an examination of the seat of the former, I found quite an induration existing there: thus verifying M. Ricord's opinion, that induration
may remain after cicatrization, and being generally a sign of future symptoms, requires peculiar attention. Not very long after his supposed cure, he was attacked with a sore throat, as he imagined, which terminated in a large ulcer in the left side of the fauces, and likewise one on the velum pendulum palati, which were soon succeeded by the following symptoms, at the time (the 3d of November, 1842,) the case fell into my hands: The glands on the right side of the neck, to the number of four or five, were very much enlarged, painful, hard to the touch, and slightly red externally. The iris of the right eye was intensely inflamed; in fact, a pure syphilitic iritis. This also was quite painful, particularly on the application of a strong light. Some contraction of the pupil. The ulcer in the fauces discharged freely; so also did that of the uvula, three-fourths of which latter was destroyed. He also complained of osteo-copic pains generally, but more particularly in the lower extremities. These seemed to annoy him more at night than during the day; although, even then, at times. I had good reason to believe from his statements, that he had never suffered from anything like a rheumatic affection; no fever or other indisposition than as noted above. From the history of the case, as narrated by the patient, together with the present symptoms, it will be perceived that this was a case of secondary syphilis, resulting from an induration, in accordance with which, I ordered the following treatment:

B. Proto iodide Merc. . . . 3i.
G. Opii. . . . . . . . 5. 
Ext. Guaiac. . . . . . . 3i.
Ft. pill No. 36. . . . .

Of these pills, I directed one to be taken every day, two hours after supper. I was thus guarded in using the protoiodide in so small a dose, because I had no great experience in relation to its activity, and was desirous of becoming better acquainted with its strength, before pushing it actively. As a gargle for the throat, I ordered the following:

Corrosive Sublimate, . . . grs. xv.
Water, . . . . . . . . lb. 1. (mix.)

With this, the patient was directed to gargle the throat three times a day. He was also advised to bathe the eye in warm milk and water—to use the diet drink, in the proportion of three tumblers full during the day—to abstain from drinking and exposure—and to live upon a vegetable diet; in which latter particulars, he, like most of
devotees of Venus and Bacchus, heeded me but little; inasmuch as he got drunk several times during his illness—exposed himself to all sorts of weather—and fed largely on bacon.

Nov. 4. The same treatment was continued, except that the quantity of the proto-iodide was increased. I directed him to take one pill in the morning and one in the evening. I thus increased the quantity of the proto-iodide much sooner than I expected to do at first, on account of an increased pain in the eye and throat during the night. At this time, the patient was in a very desponding mood—thought that he did not get well fast enough—(rather early I think to complain on this score)—and stated to me, after I had ordered an increased dose of the pills, that he had taken four already this morning—on the principle that as they had no taste, they consequently had no strength. I requested him to sin no more in this respect, but to stick to the two per diem until further orders; to which plan, by holding the fear of salivation before his eyes, he adhered.

Nov. 5. Same treatment continued. I would remark here, that I have been touching the ulcers in the throat every morning with nitrate of silver.

Nov. 6. Same treatment continued.

Nov. 7. Same treatment continued, except an alteration of the gargle. The ulcers in the throat having assumed more of an irritable appearance, I ordered the following:

R. Corros. sublim. . . . grs. xv.
G. Opii . . . . o
Aq. pur. . . . . lb. 1. (mix.)
The throat to be gargled with this, as before.

Nov. 8. The same treatment continued.

Nov. 9. Same treatment continued, with this addition: I ordered him to rub in, night and morning, upon the malar process of the right side, a lump of ung. merc. about the size of a nutmeg. Ordered likewise a blister upon the right temple. This particular symptom (iritis) would have been treated actively before could leeches have been obtained, or the patient have been induced to submit to cupping. But the exhibition of the mercurial internally alone, had evidently produced a change for the better, before recourse was had to the topical application. I was also desirous of seeing how soon the internal exhibition of the remedy would act independent of assistance externally.

Nov. 10. Same treatment continued. Blister has drawn well.
A considerable improvement of the eye has taken place in this short time. Directed the blistered surface to be dressed with mercurial ointment. The ulcers in the throat have improved rapidly since using the gargle last ordered. There is not the least evidence of ptyalism.

Nov. 11. Same treatment continued.

Nov. 12 and 13. Did not see the patient, as he had felt so much better, that he took the liberty of leaving his house, and strolling about the streets, notwithstanding the inclemency of the weather.

Nov. 14. Patient has improved very much. Ulcers doing well, and the eye nearly clear. Says he took the last of his pills to-day. He has therefore taken the 36 pills in twelve days. Continues the use of the ung. merc. to the molar process, and as a dressing to the blistered surface. Directed the following:

\[
\begin{align*}
R. \text{ Proto iodide} & \quad \text{Merc.} \quad 3\text{ss.} \\
G. \text{ Opii} & \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \text{grs. ix.} \\
\text{Ext. Guaiac.} & \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 3\text{ss.} \\
\text{Ft. pill No. 36.} & \\
\end{align*}
\]

One pill to be taken every evening two hours after supper.

Nov. 15. Patient doing remarkably well. The eye is at this time perfectly free from inflammation. Ulcers in the throat healing rapidly. No mercurial effect upon the system perceptible, except the check upon the disease. He has discontinued the use of the ung. merc. as a dressing to the blistered surface, substituting ung. simplex, to which I assented, considering the state of the eye. The other remedies continued as before.

Nov. 16. By reason of other engagements, I did not see the patient to-day. On the 17th and 18th, he was absent from his house, and therefore I did not see him.

Nov. 19. He is now perfectly cured. There is no evidence whatever of the affection remaining. The ulcers in the throat have entirely healed; no tumefaction of the glands of the neck whatever; no induration of the former seat of the chancre; and he is entirely free from pain in all parts of his body. During the whole treatment he has not had the least soreness of gums, or any other symptom indicative of the specific action of mercury, other than the cure of the disease.

Remarks.—This cure presents at least one singular feature. The resistance to the specific action of the proto-iodide, which is generally considered as very active in producing ptyalism.
1845.] Case of Dry Mortification. 691

Note.—Since the above was reported, I have had a number of similar cases, which have terminated in the same happy manner, and in no single instance have I been under the necessity of producing ptyalism. Taking these cases into consideration, I am somewhat inclined to think that the remedy acts more beneficially when this latter is not produced.

Our experience corroborates that of Dr. T. We have not remarked that the proto-iodide of mercury is more apt to salivate than the other preparations of this mineral, but the reverse we believe is true.—Edts.

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ARTICLE IV.

Case of Dry Mortification, occurring immediately after Delivery—amputation of the Leg—recovery. By John G. Westmoreland, M. D., of Zebulon, Ga.

Mrs. ——, aged about thirty, in the eighth month of utero-gestation, suffered two or three weeks from great irritability of stomach, and during which time, very little nourishment was retained. Premature labor then came on, and she was delivered. Soon after this, she complained of pain and uneasiness in her second toe, with coolness of the foot, which she had felt several hours before delivery.

On examination, I found an unusual coolness of the right foot and leg; but thinking that nothing serious was to be apprehended, prescribed some warm application, and left her. I returned late the next day, and to my surprise found her suffering excruciating pain in her toes and the contiguous part of the foot. The toes were shrivelled, and the whole foot deathly cold. I immediately pronounced it a case of dry mortification, and which it has, unquestionably, proved to be.

The acknowledged proximate cause of this disease being an obliteration of the calibre in the principal arteries of the leg; or from disease, in some other way interfering with the circulation of blood through them, I have thought proper to mention the situation of my patient previous to the attack, that your readers may have the better opportunity of determining the predisposing cause in this case.

Immediately on discovering the lady’s true situation, I applied a blister to the foot, and wrapped the part, thickly, with carded wool,
to the extent of several inches above the ankle. In twenty-four hours after these applications, the toes presented a more natural appearance, the temperature of the foot generally, was raised, and the pain diminished; in fact, every thing seemed to flatter us with the hope that the part was reviving. In two days more, however, all the symptoms grew worse—the foot became swollen, and the arterial action, which for the first two or three days was moderate, now assumed a decidedly febrile character. The only position which afforded any relief for the excruciating pain, was with the shoulders elevated, and the foot hanging out of the bed. Warm applications increased the pain, and venesection, to say the best of it, did no good. In this state of extreme suffering. I made an application of cold water by affusion, which in an hour gave almost perfect ease; and from this time she could rest, in the recumbent position, with her foot on the bed, better than in any other way.

This treatment, with nauseating doses of ipecac, allayed the pain and fever, increased the temperature of the foot, and restored a cheerful countenance. But this apparent amendment was of short duration. In two or three days the pain, and other symptoms, indicating rapid progress of the disease, returned. The toes became of a dark color, the cuticle separated, and in a few days more most of the foot was sphacelated. Large and repeated doses of opium, with the cold affusions, were now brought into constant requisition, to moderate the excessive pain, which threatened her dissolution. About the twentieth day the line of demarkation began to form an inch or two above the ankle; and in five or six days, was complete. I amputated about the thirtieth day. The leg was taken off above the knee; and now (ten days since the operation) the stump is healing kindly, with every prospect of speedy recovery.

[Upon the reception of the above communication, we addressed a letter to its author, requesting a few additional particulars, to make the article more complete and satisfactory. We give below the additional facts.

We recently noticed a very similar case in a late Journal. with the difference, however, that our contributor and estimable pupil saved his patient, while the one mentioned in the foreign periodical died. The mortification in these cases may have originated either from inanition, the result of the irritable condition of the stomach, or more probably to some pressure upon the vessels or nerves of the pelvic region.—Edts.]
My patient had born two children—she felt the pain in her toe the day preceding the night she was delivered, perhaps six or eight hours previous to delivery. I have no idea that this pain induced labor, for it was inconsiderable at the time; but I think labor was brought on by excessive vomiting. Her temperament is more bilious than otherwise—there is no hereditary disposition to mortification. I judged of the temperature by my own feelings in touching. She used no particular article of diet, before nor after the attack. I never could feel the pulsation of any artery lower down than the femoral. About a week elapsed from the commencement of the pain, to the separation of the cuticle. The arteries divided in amputating had their caliber almost entirely destroyed; so much so that not a drop of blood escaped from them, consequently no ligatures were required. The arteries had the appearance of white cords, with capillary orifices the size of the point of a pin.

There is no disease in any other artery of the body that I can detect. The stump now (twenty-seventh day since the amputation) has nearly healed, and the patient is doing very well.

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PART II.—REVIEWS AND EXTRACTS.


I. Historical notices of the consistency of the Blood, and of the condition of the red corpuscles in inflammation.—Boerhaave* and his commentator Van Swieten maintained that a lentor or vicidity of the blood is connected with inflammatory disease. Langrish† describes the blood in acute fevers as being more than usually viscid and tenacious, and as containing an excess of red corpuscles. He held the incorrect opinion, common to many eminent men, either his contemporaries or immediate predecessors, as Boerhaave,‡ Keill,§ Jurin,||

† Pr. cit. Physic, pp. 22 and 74. Svo. Lond. 1733.
§ Essays on several parts of the Animal Economy, p. 95, et seq. 2d ed. Svo. Lond. 1717.
|| Phil. Trans. 1719, vol. 30, p. 1000.
On and to increased Huxam,|| and Marherr,‖ concluded that the viscidity of the blood is increased during inflammation; and this state of the blood was made the subject of several dissertations about the middle of the last century, as by Klein,** Goesling,† † Pohlius,+++ and Nicolai.§§§

On the contrary, Buechner |||| wrote a treatise on the thinned state of the blood. Quesnay††† believed that the floating of the humour which forms theuffy coat, and which he states is of the same nature as the lymph, so far from indicating a thickening, really shows that the fluidity of the blood is increased.

Quesnay also states, in anticipation of a very recent doctrine, that theuffy part is formed from the red corpuscles, destroyed and reduced into a glaire by the action of the arteries, and that this glaire abounds in acute diseases at the expense of the corpuscles, sometimes to such an extent that the red part is much diminished. Bordenave*** held somewhat similar views.

Dr. Richard Davies,+++ observing the quickened sinking of the red corpuscles in blood becoming buffy, inferred that there was a preternatural attenuation of the coagulable lymph. He called this spontaneously coagulable matter, after Borelli,+++ the gluten. We owe to Dr. Davies the earliest correct description, printed in our language, of this principle of the blood; which I mention with the hope of drawing him from the oblivion to which he has been so long and so unjustly consigned, and to notice the strange silence of the Hunters and their encomiasts about his researches.

It is now well known that the buffy coat is formed of fibrin left at the surface of the clot by the sinking of the red corpuscles. Like Davies, Mr. Hewson§§§ and Dr. Davy||||| attributed this sinking chiefly to an increased tenuity of the coagulable lymph, an inference which the two last distinguished physiologists drew from the fact discovered by Hewson, that the corpuscles fall more rapidly in the entire mass of the blood, during the formation of the buffy coat, than they will do in the serum alone. Similar views were adopted by

† Com. de Pleuritide, §§ xxviii. and xlvi. Svo. Francof. et Moenum, 1740.
|| Essay on Fevers, chap. 4, p. 36. Svo. Lond. 1769.
** De Masse Sang. Viscedine. 4to. Argentorati, 1737.
†† Diss. Inaug. de Spissitudine Sanguinis. 4to. Gottingae, 1747.
‡‡ De Spissitudine Sanguinis a neglecto motto. 4to. Lips. 1749.
§§ De Spissitudine Sanguinis. 4to. Hake, 1749.
|| De nимia Sang. Fluidit. 4to. Hake, 1749.
Thomas Houlston,* Dr. George Fordyce,† Dr. William Hunter,‡ Dr. James Makittrick,§ Dr. George Levison,∥ Dr. James Gregory,¶ Dr. Cullen,** Hugh Moises,|| James Wilson,‡‡ and others. But Mr. Hey§§ maintained that the blood is not thinned during inflammation; Mr. Grainger||| is of the same opinion, and Professor Henle and Mr. Wharton Jones§§‡ state that the coagulable lymph is really thickened.

The last two authors and Professor Wagner ascribe the formation of the buffy coat to an increased disposition of the red corpuscles to run together, as originally explained by Professor Hermann Nasse*** of Marbourg, and thus described by Mr. Jones: “The minute process leading to the separation of the liquor sanguinis from the red corpuscles, the visible condition for the formation of the buffy coat, consists in an exaltation both of the rapidity and closeness with which the red corpuscles aggregate into rolls, and these again into a sponge-work, thus squeezing out the liquor sanguinis from among the corpuscles, and allowing the greater specific gravity of the latter to come more fully into play, whereby the liquor sanguinis, which in such cases is in relatively greater quantity, collects at the top, and, coagulating, gives rise to the buffy coat.”

Dr. Davy+++ observed, that, in certain cases in which the inflammatory state is best marked, the separation of the corpuscles and coagulable lymph is most rapid. Dr. Stoker++++ has also shown that the buffy coat may occur in blood which coagulates more quickly than usual. In a thin film of such blood, Schroeder Van der Kolk, and Dr. Alison,§§§ observed that the corpuscles separate laterally, giving it a mottled appearance, as characteristic of the state of the blood as the buffy coat itself; a fact which seems to have been described by Mr. Hunter, as follows, in his Surgical Lectures, when speaking of the blood in inflammation: “The blood has an increased disposition to separate into its component parts, the red globules become less uniformly diffused, and their attraction to one another

† Elements of the Practice of Physic, Part 2, p. 28–30. 8vo. Lond. 1768.
§ No date, but some of Hewson’s experiments are noticed.
‖ Com. on the Prin. and Practice of Physic, p. 154. 8vo. Lond. 1772.
§§ An Essay on the Blood, p. 86. 8vo. Lond. 1776.
|| First Lines of the Practice of Physic, vol. i. § cxxii. 8vo. Edin. 1789.
++ Treatise on the Blood, p. 48. 8vo. Lond. 1794.
+++ Lectures on the Blood, p. 53. 8vo. Lond. 1819.
%%%% Elements of Gen. Anat. p. 44. 8vo. Lond. 1829.
%%%%% Report, §§ 1, 2, 40, 43, 49, in No. 54 of Brit. and For. Med. Rev., and §§ 9, 107 in No. 35 of same Review.
++++ Phil. Trans. 1822, p. 271.
::: Pathological Observations, pp. 37 and 44. 8vo. Dublin, 1823.
§§§ Outlines of Phys. and Path. p. 47. 8vo. Edin. 1833.
becomes stronger, so that the blood when out of the vessels soon becomes cloudy or muddy and dusky in its colour, and, when spread over any surface, it appears mottled, the red blood attracting itself and forming spots of red. This is so evident in many cases that it is hardly necessary to wait till the whole coagulates to form a judgment of it."* Dr. Charles J. B. Williams† thinks that the aggregation of the corpuscles may be a mechanical one, induced by a change in the relative dilution of the liquor sanguinis, or serum, within and without the blood corpuscle.

Since the publication of the accurate description by Dr. Hodgkin and Mr. Lister‡ the running together of the red corpuscles of the healthy blood of mammalia into piles has become well known.§ The effect of mucilage or white of egg in promoting their further aggregation was observed by Mr. Wharton Jones¶ and Professor Henle; and I have been informed by Mr. Jones that there are some observations on the subject by Nasse.‖ The effect of neutral salts in separating the corpuscles from each other was noticed by Eiller,** and since by Dr. Davy‖‖ and others.

II. Separation of the red corpuscles and liquor sanguinis in the blood of the horse.—When the venous blood of this animal is received into a small narrow vase, an upper buffy part regularly forms, quite equal in perpendicular measurement to the lower red part of the clot. This spontaneous separation was probably known to Harvey‡‡; it is mentioned by Dr. Allen Thomson.§§ and more particularly by Andral |||| Gavarret, and Delafond. My observations, unless otherwise expressed, were made on the blood of the horse.

III. Sinking of the corpuscles in the liquor sanguinis and in the serum.—It is certain that the corpuscles sink at least twice faster in the entire mass of the blood, during the formation of the buffy coat, than they will do in the serum alone, as is shown in the details of experiments 4-10.

IV. Spontaneous acceleration of the rate of sinking of the corpuscles in the liquor sanguinis and in the serum.—During the formation of the buffy coat, it is very remarkable that the corpuscles fall much faster after the first two or three minutes than before. In a mixture of serum and corpuscles, either fresh or after it has been kept some hours and occasionally agitated, there is also an acceleration, though to a less degree, in the rate with which the corpuscles subside.

† Principles of Medicine, p. 89. 8vo. Lond. 1843.
§ Dr. Davy has lately described the viscid or adhesive quality of the corpuscles. See Trans. Roy. Soc. Edin. 1843, vol. xvi. p. 54-55.
‖ Das Blut, pp. 223, 225, and 231. 8vo. Bonn, 1836.
** Hist. de l'Acad. des Sciences, année 1751, pp. 13, 14.
It is commonly greatest in the liquor sanguinis between the third and sixth minutes, and sometimes later; and later still in the serum.

V. The falling of the corpuscles rather retarded than hastened by a thinning of the liquor sanguinis — If the rapid falling of the corpuscles, during the formation of theuffy coat, be due to an attenuation of the liquor sanguinis, it follows, that, if we increase this quality without hastening coagulation or making the corpuscles lighter in relation to the containing fluid, they will sink still more quickly, and be suspended again when the mixed fluid is made thicker. I accordingly mixed dilute saline solutions and urine with the blood, by all of which its consistency and specific gravity were reduced, and its coagulation somewhat retarded. Yet in none of these mixtures was the falling of the corpuscles so rapid, nor theuffy coat so thick, as in some pure blood set apart for comparison; while in one mixture of urine and blood, which remained liquid for upwards of fifteen minutes, the corpuscles never sank enough to leave the slightest buffy surface.

It was remarkable, too, that when there was a falling of the corpuscles in these mixtures, the acceleration above noticed in the rate of sinking after a few minutes was prevented.

When the same quantity of salt was dissolved in mucilage and mixed with the blood, the corpuscles, so far from being suspended, always fell more rapidly than in blood thinned by saline matter in water, sometimes as quickly as in pure blood, occasionally quicker; and now and then with such velocity, that a clear floating portion of liquor sanguinis, two inches deep, appeared in five minutes.

In this case, the acceleration in the rate with which the corpuscles sunk, after the first two or three minutes, was still greater than in pure blood.

Some trials were next made on the falling of the corpuscles in serum made thinner and lighter by the weak saline solutions, and in serum made thicker and heavier by mucilage; whence it resulted, calculating from the time required for the appearance of a clear stratum of fluid at the top of the mixtures, that the corpuscles subsided more rapidly in the thicker than in the thinner fluid.

That the liquor sanguinis becomes viscid in changing from the liquid to the solid state, as originally described by Dr. Davy, is a fact easily shown. But, on the other hand, it has never been supposed that it becomes thinner before it coagulates, after its abstraction from the animal. Yet to this improbable conclusion we shall be led, if we admit that the sinking of the corpuscles in the liquor sanguinis is a correct measure of its consistency or tenacity.

VI. State of the red corpuscles in buffy blood.—As it is certain, ceteris paribus, that the falling of particles through a light and thin fluid must be quicker than through a heavier and thicker one, the state of the corpuscles in these different fluids cannot be equal.

And that such is really the case, may easily be seen with the naked

* Phil. Trans., 1822, p. 273.
eye. Thus, in thin layers of those viscid mixtures in which the corpuscles sunk most rapidly, they were so clustered as to appear like particles of coarse and dark red powder in an excess of limpid fluid; while the thinner mixtures, in which the corpuscles fell most slowly, were of an uniform and lighter red colour, from the separation and equable diffusion of the corpuscles throughout the fluid. With the aid of the microscope the corpuscles of human blood, which had no buffy coat, were seen frequently in piles; but these were only occasionally grouped into clusters, and by far the greater number of the corpuscles were either separate or very loosely connected together. In buffy human blood the corpuscles are more aggregated. But it is in the naturally buffy clot of the horse's blood that the aggregation of the corpuscles is most remarkable; they appear as if melted together, and are almost universally collected into clusters, the piles sticking to each other. These observations were made at various times after coagulation.

VII. Agents which prevent and increase the aggregation of the corpuscles.—When a saline solution was mixed with the clustered corpuscles, their connection was quickly dissolved, so that they were all separated and equably diffused throughout the liquid. Either urine or syrup had the same effect. On adding mucilage, the corpuscles again became aggregated, and they were again dispersed by another dose of saline matter. A small proportion of salt mixed with the mucilage promotes the clustering of the corpuscles more than the mucilage alone, as is shown in experiments 22–25. The salt alone had the effect of more or less reducing the size of the corpuscles, as if it dissolved a part of their surface. The serum of one animal often causes the corpuscles of another animal to become aggregated very quickly.

VIII. A probable cause of the efficacy of saline medicines in inflammations.—As only a very weak saline solution is required to prevent or destroy the aggregation of the corpuscles, and to correct the tendency in the blood to the formation of the buffy coat, may not this action of the salt be one cause of the well-known utility of saline medicines in inflammatory diseases?

IX. Cause of the rapid sinking of the corpuscles, and of its accelerated rate during the formation of the buffy coat.—The aggregation of the corpuscles was connected with their most rapid sinking, and their separation and diffusion with their most tardy sinking; while their rate of falling was hastened by a thickening and retarded by a thinning of the liquor sanguinis. The largest particles of a powdered substance will sink quicker in a fluid than the smallest particles. In some experiments with magnesia in a solution of Epsom salt, and with poppy seed in mucilage, there was no evident acceleration in the rate of sinking, similar to that of the red corpuscles through the liquor sanguinis. I know not that this acceleration can be explained otherwise than by the increasing aggregation of the corpuscles during their descent. Yet there was a like accelera-
tion, though to a less degree, in the falling of the corpuscles through the serum, in which they were clustered from the beginning of the experiment, or even many hours before. But the masses may coalesce still further during their descent; and it will be recollected that the accelerated sinking is quite prevented, or even reversed, when the corpuscles are kept apart by weak saline solutions.

X. Details of Experiments.—For the sake of precision, which appears the more necessary since Mr. Prater* has shown the opposite effects on the blood of different quantities of the same substance, I shall detail some of the principal experiments made in the course of the present inquiry. They will be found to illustrate many points foreign to the subject now considered, such as the effects of various substances on coagulation and on the contraction of the clot. The experiments were all conducted under the following circumstances, unless otherwise mentioned; and my best thanks are due to Mr. Siddall, the able veterinarian of the Blues, for his kind assistance. The blood used was drawn from the jugular veins of troop horses; and, in comparative trials, in order that every portion of it should be as nearly as possible alike, the blood was received from the animal into a pitcher, stirred for a few seconds with a stick, and then quickly poured into the different vases for observation. These were common circular glass bottles, with the tops cut off, and holding about six ounces when filled within about half an inch of the rim; thus filled, the column of fluid measured about four inches in length, and one and three-fourths in diameter. The agitation used to mix the different matters with the blood was also applied to the pure blood set apart for comparison. As the corpuscles in pure blood are soaked in the *liquor sanguinis*, they were well mingled with the artificial fluids. If dropped on or only just dipped in a dense saline solution, they may remain awhile at the top, just as a piece of fibrin will do, though it sinks at last, in a saturated solution either of Glauber salt, of nitre, or of muriate of soda. This is an important fact in relation to the use of such solutions in estimating the specific gravity of fibrin, as was done by that excellent observer, Dr. Benjamin Babington.* His estimate was probably too high, as the saline solution deprives the fibrin of some of its natural moisture. In a weak saline solution, the corpuscles will fall rapidly before they become disjoined and saturated, though very slowly afterwards. If they become specifically heavier or lighter by endosmosis or exosmosis, it may be supposed that their specific gravity would only be approximated, within certain limits, to that of the fluid in which they are placed; and that they would differ no more from the fluid in that respect than they did originally from the *liquor sanguinis*. When the corpuscles are stated to have sunk to any extent, it is merely meant to express that a clear

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supernatant stratum of fluid was left, corresponding to the given measure; and when it is noted that there was no sinking of the corpuscles, it is simply to affirm that enough of them remained at the top to preserve its opaque red colour.

XI. Sinking of the corpuscles in blood received from the animal, and not agitated afterwards.

I. In \(\frac{3}{4}\) minutes the corpuscles sunk \(\frac{1}{2}\) inch.
\[
\begin{align*}
5\frac{1}{2} & : 1 \\
7\frac{3}{4} & : 1\frac{1}{2} \\
8\frac{3}{4} & : 2 \text{ inches.} \\
9\frac{1}{2} & : 2\frac{1}{2}.
\end{align*}
\]

XII. Sinking of the corpuscles in the same blood, broken up in the serum twenty-four hours afterwards, and strained through linen.

II. In 6 minutes the corpuscles sunk \(\frac{3}{4}\) inch.
\[
\begin{align*}
8 & : \frac{1}{2} \\
11 & : 1\frac{1}{2} \\
16 & : 1 \\
25 & : 1\frac{3}{4} \\
34 & : 2 \text{ inches.}
\end{align*}
\]

3. In some blood from another horse, treated in the same way after keeping seven hours, the corpuscles fell, in eleven minutes, one inch, and in twenty-three minutes, two inches.

XIII. Comparative sinking of the corpuscles in the liquor sanguinis and in serum.

4. Blood divided into three portions. In the liquor sanguinis the corpuscles sunk,

In \(2\frac{1}{4}\) minutes, \(\frac{1}{8}\) inch.
\[
\begin{align*}
3\frac{1}{2} & : \frac{1}{4} \\
4\frac{1}{2} & : \frac{1}{8} \\
5 & : \frac{1}{2} \\
6 & : \frac{3}{4} \\
7 & : 1.
\end{align*}
\]

5. In a second portion, deprived of fibrin by whipping, the corpuscles sunk,

In 5 minutes, \(\frac{1}{8}\) inch.
\[
\begin{align*}
7 & : \frac{1}{4} \\
9 & : \frac{3}{4} \\
10 & : \frac{1}{2} \\
13 & : \frac{3}{4} \\
15 & : 1.
\end{align*}
\]

6. In the third portion, deprived of fibrin by agitation with nails in a bottle, excluding air as much as possible, the corpuscles fell at the same rate. The specific gravity of the serum at \(60^\circ\) was 1029; and it coagulated at a heat of \(158^\circ\).

7. In the liquor sanguinis of another horse the corpuscles subsided.

In \(2\frac{1}{4}\) minutes, \(\frac{1}{8}\) inch.
\[
\begin{align*}
3\frac{1}{4} & : \frac{1}{4} \\
4\frac{1}{4} & : \frac{3}{4} \\
\end{align*}
\]
In 4½
5
6
8
9
10½

\[ \frac{1}{2} \text{ inch}. \]
\[ \frac{3}{4} \]
\[ \frac{7}{8} \]
\[ \frac{1}{3} \]
\[ \frac{13}{4} \]
\[ 2 \text{ inches}. \]

At the end of fourteen minutes there was a film on the top; beneath quite liquid; coagulated in sixteen minutes. Final perpendicular measurement of the upper buffy part two and a-half, and of the lower red part, one and three-fourth inches.

8. In a second portion, immediately after removing the fibrin in a bottle, excluding air, the corpuscles subsided,

In 8 minutes,

\[ \frac{1}{2} \text{ inch}. \]
11
12½
13
14
15½
17½
20
21
24
27

\[ \frac{1}{4} \]
\[ \frac{3}{8} \]
\[ \frac{1}{3} \]
\[ \frac{7}{8} \]
\[ 1 \]
\[ 1 \frac{3}{5} \]
\[ 1 \]
\[ 1 \frac{1}{2} \]
\[ 1 \]
\[ 2 \text{ inches}. \]

9. After the lapse of twenty-four hours the superstratum of serum, in Exp. 8, measured two and seven-eighth inches, and the substratum of corpuscles one and three-fourth. The mixture was then shaken, when the corpuscles sunk as follows:

In 11 minutes,

\[ \frac{1}{3} \text{ inch}. \]
14
15½
16½
17½
19
20
21
22½
23½
25
27
31
36

\[ \frac{1}{3} \]
\[ \frac{3}{8} \]
\[ \frac{1}{3} \]
\[ \frac{7}{8} \]
\[ 1 \]
\[ 2 \frac{1}{4} \]
\[ 1 \]
\[ 1 \frac{3}{8} \]
\[ 1 \frac{1}{4} \]
\[ 1 \frac{3}{8} \]
\[ 1 \]
\[ 1 \frac{3}{8} \]
\[ 2 \text{ inches}. \]

10. In the same mixture, after agitation the next day, the corpuscles fell at the same rate. They subsided most slowly in the newest serum in Exp. 35 and 38.

XIV. Sinking of the corpuscles of one animal in the serum of another.

11. Corpuscles of human blood which took 13 minutes to sink \( \frac{1}{4} \text{ th of an inch in their own serum, sp. gr. 1028, sunk in horse's serum,} \)
of the same sp. gr., above twice as rapidly, and with a remarkable acceleration after they began to sink. The aggregation of the corpuscles was very plain to the naked eye quickly after they were put into the horse’s serum. See Exp. 37 and 41.

12. Corpuscles from horse’s blood sunk quicker in human serum, sp. gr. 1032, than in their own serum, sp. gr. 1028.

XV. Slow sinking of the corpuscles in weak saline solutions.

13. \( \frac{2}{3} \) ss. of mixed serum and corpuscles agitated with \( \frac{1}{4} \) iv. of solution of nitre, 10 grains to an ounce of water, sp. gr. 1020. The corpuscles took an hour to sink an inch.

14. A similar trial, substituting urine, sp. gr. 1024, for the solution of nitre. The corpuscles fell equally slow.

15. In the serum, sp. gr. 1028, for comparison with Exp. 13–15, the corpuscles sank half an inch in 15 minutes.

XVI. Formation of the Buffy coat prevented or lessened by making the blood thinner and lighter, and its coagulation retarded.—Sinking of the corpuscles slower after a few minutes, contrary to their rate of falling in pure blood.—N. B. Sp. gr. of the weakest saline solution 1011, five grains of common salt to an ounce of water; the weak saline solution, sp. gr. 1020, 10 grains to the ounce. Urine, sp. gr. 1023.

16. Equal parts of urine and blood. Liquid at the end of fifteen minutes; began to coagulate around the margin in seventeen minutes; a soft jelly in twenty-two minutes. There was no Buffy coat. See Exp. 19.

17. Pure blood, for comparison with Exp. 16. The corpuscles fell an inch in seven minutes, and it coagulated in twelve minutes.

18. Blood for this and the next three experiments from another horse. A portion of the unmixed blood coagulated in ten minutes, and the corpuscles sunk very nearly as noticed in Exp. 4.

19. Equal parts of urine and blood. In four minutes the corpuscles sunk one-fourth of an inch; and ultimately no more than three-eighths of an inch. Coagulation did not begin until after sixteen minutes. Differs from the like Exp. 16, in which there was no sinking of the corpuscles.

20. Equal parts of weakest saline solution and blood. In four minutes the corpuscles sunk one-eighth of an inch; in eight and a-half minutes one-fourth of an inch; and never more than three-fourths of an inch. Mixture liquid at the end of twenty-two minutes; viscid in twenty-five; jellied in twenty-eight.

21. Equal parts of weak saline solution and blood. In four minutes the corpuscles sunk one-eighth of an inch; and finally, no more than three-eighths. Coagulation two minutes sooner than with the weakest saline solution, Exp. 20.

XVII. Sinking of the corpuscles accelerated by adding mucilage and salt to the blood.

22. \( \frac{2}{3} \) ss. of mucilage, sp. gr. 1030, seven and a-half grains of muriate of soda, \( \frac{3}{3} \) ii. of blood. Sinking of the corpuscles very rapid, and the rate much accelerated after a minute or two, viz:
In 3 minutes, \( \frac{3}{8} \) inch.  
3\( \frac{1}{2} \)  : 1  
5  : 2 inches.  
7  : 2\( \frac{1}{2} \)  
9  : 2\( \frac{2}{3} \).  

Coagulated in eighteen minutes; buffy part throughout firm and contracted next day.

23. \( \frac{5}{8} \)iss. of the same mucilage, ten grains of muriate of soda, and \( \frac{5}{3} \)iii. of blood. The corpuscles sunk.

In 3 minutes, \( \frac{3}{8} \) inch.  
4  : 1  
5  : 1\( \frac{1}{2} \)  
9  : 1\( \frac{3}{4} \).  

Coagulated in thirteen and a-half minutes. Buffy part firm and contracted next day. Aggregation of the corpuscles, as in Exp. 22, quite plain to the naked eye.

24. \( \frac{5}{8} \)i. mucilage, sp. gr. 1055, and \( \frac{5}{4} \)iv. of blood. The corpuscles sunk,

In 4 minutes, \( \frac{1}{8} \) inch.  
7  : \( \frac{1}{8} \)  
9  : \( \frac{1}{6} \)  
10 : \( \frac{2}{5} \)  
13 : \( \frac{3}{8} \).  

Not coagulated in less than twenty minutes. Contraction of clot very slight next day. The corpuscles sank rather slower than in pure liquor singuinis, but much faster than in blood, mixed with dilute saline solution without mucilage.

25. \( \frac{5}{8} \)i. of the same mucilage, ten grains of muriate of soda, and \( \frac{5}{4} \)iv. of blood. The corpuscles sunk,

In 6 minutes, \( \frac{3}{8} \) inch.  
8  : \( \frac{1}{6} \)  
10 : \( \frac{2}{5} \)  
13 : \( \frac{3}{8} \).  

Coagulated two or three minutes quicker, and the clot contracted rather more than in Exp. 24.

26. \( \frac{5}{8} \)iss. weakest saline solution, and \( \frac{5}{3} \)iii. of blood. In three minutes the corpuscles sunk one-eighth of an inch; in five minutes one-fourth; in ten minutes one-half. A film on the top in twelve minutes; coagulated in fourteen.

27. \( \frac{5}{8} \)iss. weak saline solution, and \( \frac{5}{3} \)iii. of blood. In three and a half minutes the corpuscles sunk one-eighth of an inch; in six minutes one-fourth; and finally, only three-eighths of an inch. Viscid in ten minutes: a trembling clot in twelve.

28. A portion of blood used in the experiments from 22 inclusive, coagulated in ten minutes, and had an upper buffy part equal in perpendicular measurement to the lower red part.

In all the trials of urine and the saline solutions with blood, the contraction of the clot was either much diminished, or prevented;
though not so when mucilage was added with the salt. Coagulation was most retarded by the weakest saline solution.

XVIII. Sinking of the Corpuscles more rapid in serum made thicker and heavier, than in serum made thinner and lighter. The accelerated rate of sinking promoted by the thicker and prevented or diminished by the thinner fluid.—N. B. Saline solution, sp. gr. 1020, 10 grains of muriate of soda to an ounce of water. Urine sp. gr. 1028. Mucilage sp. gr. 1085. 3 iv. of gum arabic to a pint of water. Blood in Exp. 29-35 drawn twenty-four hours; fibrin separated from it in a bottle excluding air; sp. gr. of serum 1028.

29. Equal parts of saline solution and blood without fibrin. In forty minutes the corpuscles fell one-twelfth of an inch, in 150 minutes three-eighths of an inch.

30. The same, adding 3/8 of mucilage. Sinking of the corpuscles rapid, but the separation of them from the fluid at first imperfect. It was clearer in one minute half an inch from the top. In six minutes the corpuscles had fallen through the column of the fluid, the line of separation between it and the corpuscles being distinct one inch from the bottom. After shaking the mixture next day, they subsided in two minutes one-fourth of an inch, and then with the same velocity as the day before.

31. Equal parts of urine and blood without fibrin. In forty minutes the corpuscles fell one-twelfth of an inch; in 150 one-fourth of an inch.

32. The same, adding one ounce of mucilage. In fourteen minutes the corpuscles sunk one-fourth of an inch; in seventeen minutes half an inch; in twenty-three minutes one inch; in thirty-one minutes one and a-half inch; in forty-eight minutes one and seven-eighths of an inch.

33. 3/8 of saline solution and 3/8 of blood without fibrin. In eleven minutes the corpuscles sunk one-eighth of an inch; in fifteen minutes one-fourth of an inch.

34. 3/8 of mucilage and 3/8 of blood without fibrin. Sinking of the corpuscles quick, but the line between them and the supernatant fluid at first indistinct. In six minutes they subsided about one-eighth of an inch; in eleven minutes three-fourths of an inch; in fifteen minutes one and a half inch, with a distinct line between the corpuscles and the fluid.

35. Blood without fibrin for comparison with Exp. 29-35. The corpuscles sunk in six minutes one fourth of an inch; in eleven and half minutes half an inch; in fifteen minutes one and a half inch.

36. The same, only an hour after it was drawn. The corpuscles fell in twelve minutes a quarter of an inch; in fifteen minutes half an inch; in thirty minutes one and a half inch. Thus the sinking was the slowest in the newest serum, contrary to Exp. 8, 9, and 10.

37. Blood without a buffy coat, taken twenty-four hours before from the basilic vein of a man, aged forty, affected with pulmonary catarrh. Clot broken up in the serum and strained through tow.
The mixture thicker and darker than horse's blood, apparently from a greater proportion of corpuscles. They took sixty minutes to sink one-eighth of an inch. See Exp. 11 and 41. The three next experiments with parts of the same blood.

38. §i. of mucilage mixed with §iii. of the strained blood. The corpuscles sank in thirty-two minutes one-eighth of an inch; in forty minutes one-fourth.

39. §i. of saline solution and §iii. of the strained blood. In forty minutes the corpuscles subsided one-tenth of an inch.

40. Sp. gr. of the serum 1027. It coagulated at a heat of 159.

41. Blood with a thick buffy coat from a young man with pulmonary catarrh. Strained as in Exp. 37. Thicker and darker, apparently from a greater proportion of corpuscles than horse's blood. They sunk in thirty-nine minutes one-tenth of an inch; in fifty-six minutes one-eighth of an inch. See Exp. 11 and 37.

XIX. Effects of syrup made of equal parts of white sugar and water.

42. §iiss. syrup and §iii. of blood. No sinking of the corpuscles. A weak jelly in twelve and a half minutes. No contraction of clot or exudation of serum.

43. §iiss. syrup, ten grains of muriate of soda, and §iii. of blood. Same as the foregoing, except that coagulation was two minutes later.

44. Blood for comparison with Exp. 42 and 43. Coagulated in eleven minutes, with the usual deep buffy coat.

XX. Effects of increasing the proportion of serum and of water in the blood.

45. §iiss. serum added to §iv. of blood. The corpuscles sunk in two and a half minutes one-eighth of an inch; in three minutes one-fourth, and never subsided further. Coagulation took place in eight minutes.

46. §iiss. of serum to §iv. of blood. The corpuscles fell in 3 minutes ½ of an inch; in 5 minutes ¼ an inch, and sunk no further. Coagulation in 7 minutes.

47. Some blood, for comparison with Experiment 45 and 46, coagulated in 10 minutes, and the corpuscles sunk as deep as usual.

48. §i. of serum and §iv. of blood from another horse. The corpuscles sunk only ⅜ths of an inch. Coagulation took place in 4 minutes.

49. §ii. of serum and §iv. of blood. Coagulation and sinking of the corpuscles the same as in the foregoing.

50. Blood, for comparison with Experiment 48 and 49, coagulated freely in 6 minutes, when the corpuscles had fallen one inch.

51. §i. of serum and §iii. of blood from another horse. Corpuscles sunk ⅘th of an inch. Coagulated in 3½ minutes. Clot much contracted next day.

52. §1. distilled water and §iii. blood. No sinking of the corpuscles. Coagulated in 6 minutes. Clot contracted next day, but less so than the preceding.
53. Blood, for comparison with Exp. 51 and 52. Coagulated in three and a-half minutes. No buffy coat.

54. 3i. of serum and 3iii. of blood from another horse. Corpuscles sunk in four minutes three-eighths of an inch; in five minutes two-thirds of an inch; in six minutes one inch; in seven minutes one inch and a quarter, and never further. Coagulated in eight minutes.

55. 3ii. distilled water and 3iii. blood. Corpuscles sunk in seven minutes one-eighth of an inch, and finally no more than one-third of an inch. Began to coagulate in thirteen minutes, and a feebile jelly in fifteen.

56. Blood, for comparison with Exp. 54 and 55. Corpuscles sunk in four minutes one-eighth of an inch; in five minutes one-fourth of an inch; and finally one inch and three-fourths. Coagulation the same as in Exp. 55.

XXI. Effects of increasing the proportion of the corpuscles.

57. 3j. of corpuscles and serum, obtained by straining the broken-up clot and serum through linen, mixed with 3iv. of blood, part of that used in Exp. 48, 49 and 50. No sinking of the corpuscles. Coagulated rather firmly in three minutes.

58. The same, with an additional ounce of strained cruror, gave the same result, except that coagulation was half a minute later.

59. 3v. of whipped blood and 3iv. blood from another animal. No sinking of the corpuscles. Coagulated firmly in seven minutes.

60. The same with double the quantity of whipped blood, gave the same result.

61. 3j. of whipped blood and 3iv. of blood. The corpuscles subsided in three and a-half minutes one-eighth of an inch; in four and a-half minutes one-fourth of an inch; in six minutes three-eighths of an inch; and, finally, no farther. Coagulated in less than eight minutes. In this experiment the corpuscles sank more quickly, when added to blood just drawn, than they would do in the serum alone.

62. 3vi. of corpuscles, from which as much serum as possible had been decanted, and 3iv. of blood. No sinking of the corpuscles. Coagulated in six minutes.

63. A portion of the blood used in Exp. 59 to 63, set apart for comparison, coagulated in fourteen minutes, with a buffy part two inches deep.

Some of the conclusions from the preceding experiments may here be recapitulated.

1. There is a remarkable acceleration, after a few minutes, of the rate with which the red corpuscles sink in the liquor sanguinis; and in the serum alone, though to a less degree.

2. This acceleration may be increased by increasing the aggregation of the corpuscles; and prevented or reversed by preventing or destroying the aggregation of the corpuscles.

3. The sinking of the corpuscles may be slower in blood thinned by weak saline solutions than when mucilage is added with the salt.
4. The sinking of the corpuscles is slower in serum made thinner and lighter by weak saline solutions, than in serum made thicker and heavier by mucilage.

5. In the blood of the horse, the buffy coat forms regularly; and the red corpuscles unite, as if partly fused into each other, and collect into masses.

6. There may be no buffy coat, or but a comparatively thin one, on this blood, when it has been made thinner and its coagulation retarded.

7. The formation of the buffy coat is neither due to an attenuation of the liquor sanguinis, nor to a diminution of its specific weight, nor to slow coagulation; but to an increased aggregation and quickened sinking of the corpuscles.

8. These facts are favourable to the old doctrine of lentor, or viscosity of the blood and union of the corpuscles; and against the more recent doctrine of attenuation of the blood in inflammation.

9. The corpuscles of the horse sink much quicker in his serum than the corpuscles of man do in his.

10. Increasing the proportion of the corpuscles hastens coagulation and diminishes the formation of the buffy coat more than increasing the serum only.

11. Increasing the proportion of water simply, does not hasten the coagulation of the blood, as increasing the proportion of serum does.

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On Galvanism applied to the Treatment of Uterine Hemorrhage.

By Thomas Radford, M. D. (From Prov. Medical Journal.)

Uterine hemorrhage is usually divided into that which takes place in the early months, and that which takes place in the latter months of gestation. The latter class is again subdivided into what are called accidental hemorrhages, unavoidable hemorrhages, and the after hemorrhages. Accidental hemorrhages are those which arise from accidental causes; unavoidable hemorrhages are those which arise from a particular location of the placenta in the immediate neighborhood of the os uteri; and the after hemorrhages are those which take place after the delivery of the child, and they may occur either before or after the expulsion of the placenta. You will be also aware that there are a number of other uterine hemorrhages which are unconnected with gravidity; but it is my object in this lecture more particularly to dwell upon those discharges of blood which are connected with pregnancy in the latter months and with labour. It is not my intention, on the present occasion, to enter into a full consideration of the subject, but more particularly to confine my remarks to that condition which is the result of profuse and long-
continued bleeding, viz., exhaustion, a state highly interesting to the obstetrician, and which seems to me to require more than the recognized means for its management.

Now, we know that exhaustion may arise in all the varieties of hemorrhage; but we find that it is more especially produced by those impetuous and large discharges of blood which take place before, during, and after labour.

With regard to those cases of flooding, before and during labour, which have proceeded to a state of exhaustion, it has been the custom of many obstetrical writers to recommend the practice of delivery. Others have discountenanced delivery in this particular condition; and of course, where the principles of practice are unsettled in a case so important, it is very desirable that we should endeavour to discover some new method of treatment which shall place the question beyond dispute. Although such high authorities as Burns and Hamilton advocate delivery in these cases, it has always been my practice to recommend non-delivery; and if we were to analyze the cases that have been published in the reports of hospital and private practice, and those that have accidentally come to our knowledge, we should be startled at the immense loss of life arising from these extreme cases of hemorrhage, where delivery has been adopted.

Now, I regret to say, I believe that the great ruling influence upon the mind of practitioners, in determining them to deliver at all hazards in these cases, is the dread of popular opinion. It is usually stated that no woman ought to die undelivered; and where a woman does die undelivered, it produces a very considerable sensation, both in the neighborhood and in the mind of every party who may come to a knowledge of the circumstances. On this account a practitioner dreads the procrastination of delivery, lest death should occur before it can be accomplished, and his character consequently involved in censure. Now it appears to me, that when a practitioner is thus placed, he ought to possess sufficient moral courage to resist the pressure of popular opinion, and be guided by a higher principle in the discharge of his duty; and I am convinced that if the matter is fairly and dispassionately considered, it will be found that there is a great advantage in not delivering in these cases of exhaustion.

And first, with regard to the child, it is stated by the advocates for delivery, that there is the greater probability of its being saved by the immediate adoption of this operation, than by its delay. But if we take the pains to investigate the reports that have been published, as well as to examine into the results of the practice of private individuals, it will be found that the child is nearly always dead in these extreme cases. Therefore this consideration ought not to have much weight with us in deciding upon the principle of practice. And if we reflect upon the causes which give rise to hemorrhage, more especially in placenta praevia, we shall find sufficient reason for understanding why the child should be generally dead. In the accidental species of hemorrhage, if the cause has been such as not only to lead
to a separation of the placenta, but to something like a disruption or a wounded state of that organ, the death of the child is nearly inevitable; and in the unavoidable species, from the particular location of the placenta, if we recollect what must be the influence of labour upon the placenta itself, not only in producing detachment and a separation of its connection with the sides of the os uteri, but also the mechanical influence applied by the child's head coming upon it, we must see that in this case there is generally more or less of a disruption and breaking up of its structure; and consequently the child dies from bleeding from its own particular system.

If we go into inquiries as to the influence of the death of the child upon the hemorrhage, we must look upon it as being rather an advantage to the mother, because it takes off a certain demand upon the blood, or lessens what Hunter calls "the stimulus of necessity," and therefore makes such a change in the balance of her circulation, as would be a means of checking, rather than increasing, the discharge.

We will now proceed to consider the question as regards the life of the mother; and when we are contemplating a subject of this kind, a woman placed under extreme circumstances of inanition or exhaustion, we ought not to ask, "Ought a woman to be delivered?" but, "Can a woman be delivered safely?" That is the question we ought to endeavour to settle in our minds before we proceed to the operation. If we have a woman already in a state of exhaustion from large evacuations of blood, we must be certain that a plan of treatment which, in any way, produces an unfavorable change upon the nervous and circulatory systems, must add to the evils already existing. We have here sufficient prostration; and the mere emptying of the uterus will most inevitably increase it. Every surgeon is aware of the influence that is produced by the operation of tapping in cases of ascites in men strong in comparison of some of these poor women, reduced as they are by the loss of so large a quantity of blood. Syncope, nay, even death, is sometimes the result of the abstraction of the ascitic fluid. We know also in some cases, and especially where there is a particularly exalted state of the nervous system, or some particular idiosyncracy, that simple evacuation of the uterus, by the natural efforts, will produce death! This very change then has in itself a very unfavorable influence upon a woman thus prostrated. But, besides this, we must bear in mind that there must necessarily be a great demand upon their powers by the stimulus of forcible delivery.

There are a number of other circumstances which ought to be taken into account, as regards delivery. And one of the most important of these is the physical or structural impediment that may arise from a rigid os uteri. And when we come to the bedside of a patient, (I am sure every gentleman who has had much practical experience, will bear me out in this statement,) we shall find that some of those dogmas which are laid down in books are wholly untrue. I now refer particularly to that assertion of certain writers, who say,
that by the evacuation of blood, the soft parts become so weakened and dilatable, that delivery can always be accomplished. This I most positively deny. And therefore I say that there are conditions of this kind which will be an obstacle to delivery.

The os uteri will continue undilatable, although the woman may be in such a state of exhaustion as to be literally tottering on the brink of the grave! It is true that this state of matters does not generally exist, but it is too frequent to be overlooked in determining our line of practice.

Again, we should be aware that hemorrhages take place, and produce this state of exhaustion, before the woman has progressed to that period of pregnancy that would justify a practitioner in having recourse to forcible delivery; and this is a point not sufficiently dwelt upon by obstetrical writers. In proportion to the early occurrence of hemorrhage, so will be the obstacles to delivery, as regards the introduction of the hand into the uterus. And when we are considering the chances of delivery, and taking into account the dilatable state of the cervix and the os uteri, we should never forget the length of the former as regards the particular period of pregnancy. And not only is this to be taken into account, but there is another circumstance which must not be overlooked, viz., the degree of subsidence of the uterus into the pelvis; for according as the uterus remains high in the pelvis, so we may be certain that the difficulties of delivery will be proportionate.

In all uterine hemorrhages connected with pregnancy, there are certain attendant circumstances, viz., separation of the placenta, with or without disruption of its structure; exposure of the large orifices connected with the uterine sinuses, rupture of the decidual vessels and atony of the uterus, which is either primary or secondary. The natural means for suppressing the discharge are the formation of coagula, and the contraction of the uterus. As to the adhesion of the placenta, when once separated, or the cicatrization of this organ when disrupted, the practitioner can place no reliance on them in checking the flooding.

With respect to the coagulation of the blood, it may become influential in arresting slight discharges, but never ought to be depended upon in those profuse hemorrhages which we are now more particularly considering. The coagula which forms in the vagina, and which are stated to be so important in the suppression of the bleeding, may become indirectly an evil instead of an advantage, by determining the practitioner from making a proper investigation of the case, under the idea "that the disturbance of these coagula is death." In my opinion, the coagula which are more particularly to be depended upon, are those in the immediate neighborhood of the venous orifices that have been exposed, and I repeat that these are of no avail in the more serious cases; and therefore we must solely trust for the suppression of these large discharges of blood to that most important agent, contraction of the uterus.
The ordinary means of producing uterine contraction are so well known that I need merely refer to them before the present audience. We have the bandage, friction applied briskly over the uterus, grasping pressure, secale cornutum, the application of cold, and, in the after hemorrages, the introduction of the hand into the uterine cavity. But all these means may fail in producing this desirable change, and will fail and do fail in the extreme cases.

A fatal case having recently occurred in this town [Manchester], which produced a considerable sensation at the time, where delivery was adopted, contrary to the principles which I had always publicly inculcated in my lectures, I was led to investigate the arguments of those who advocate that practice, more closely than I had perhaps ever before done; and it struck me that we were deficient in a means on which we might always depend for inducing uterine contraction, and so placing the woman in such a state of safety that the operation of delivery might be deferred. Whilst my mind was so much occupied upon this subject, I was consulted by my friend Dr. Goodwin, in a case of protracted labour, where the long forceps were required. The lady recovered well, with the exception of not being able to pass her urine. We administered all the usual remedies for a fortnight or more, using the catheter twice, sometimes three times a day, but without the least amendment. Upon Dr. Goodwin's suggestion, we decided upon the application of galvanism, which was undertaken by him, and the result was most gratifying, for the first application proved permanently successful. The decided efficacy of this plan in restoring the energy of the bladder, immediately led me to conclude that it was the very agent that I have already stated was a desideratum to ensure uterine contraction in cases of severe flooding, attended with exhaustion. We have here a woman reduced by loss of blood, with an atonic state of the uterus, either primary or as the result of the discharge. Now, as the advocates of delivery (vide Burns and Hamilton) say that this proceeding gives the woman the only chance of living, because, so long as the uterus remains distended by its contents, and its parietes atonic, those large venous orifices which have been exposed by the separation of the placenta, are so situated, that the chances of further effusion of blood exist; it occurred to me that the application of galvanism would so effectually act upon the uterine tissue as to induce firm contraction of its fibres, and thereby at once lessen those large openings, and bring the walls of the uterus into firm apposition with the body of the child, so as to entirely close them. This great object having been attained, we might safely procrastinate the delivery, and adopt such means as would tend to raise the vital powers of our patient, such as the administration of opium, stimulants, and support; and the performance of the important operation of transfusion. With the uterus in this favorable condition, our restorative means, and particularly transfusion, would be far more likely to be attended with successful results than if the organ were distended and atonic; for in this case, the
blood which is introduced into the system, either directly by transfusion or indirectly by nourishment, produces no permanent benefit, because it is rapidly discharged again. Analogy further led me to believe that my conjectures would not prove unfounded, for galvanism is particularly impressive in its influence upon the muscles of recently-killed animals, and we know how strictly allied in action, if not in structure, the uterus is to muscle.

I mentioned my views to a number of medical friends, who generally much approved of them; and I was soon enabled practically to prove their correctness, by being called in consultation to a case of frightful hemorrhage during labor, attended with extreme exhaustion, and where the os uteri was so rigid that the advocates of delivery could not possibly have carried their views into practice, without lacerating the os and cervix uteri. By this case I ascertained that galvanism produces an effective and powerful contraction of the uterus; and not only so as regards its tonic contraction, but it has also the power of energetically exciting alternate contraction when applied at intervals. I can tell you, most seriously and most solemnly, that it produces these two important changes upon the uterus in such a degree as, in my previous reflections on the subject, I had no conception of. The alternate contraction excited by this agent is analogous to, and as powerful as, that which is observed in normal labour, and the tonic contraction is greater. I shall not relate cases in detail, because it would occupy too much time; but I may state that I applied galvanism in a case where the membranes were unruptured, and the uterus in a state of great inertia, and alternate contraction was immediately produced. Before this the membranes were very flaccid; but as soon as the galvanic circle was completed, they became extremely tense, and protruded low down into the vagina; and this state of tension did not subside when the alternate contraction ceased, as is observed in some degree in normal labor; for although the galvanic conductors were removed, so great a degree of tonic contraction of the uterus had been induced, that this membranous bag could not collapse.

I am thus satisfied, that by the application of this means, we can induce such a state of chronic contraction in the uterus, that in these extreme cases of exhaustion from hemorrhage, the woman may be placed in such a state of safety, that delivery may be postponed until a time arrives when it can be safely accomplished, and in the meantime we can have recourse to those measures which tend to raise the vital powers.

I think it probable that it may also produce one of the other natural means of suppressing hemorrhage which I have already referred to, viz., coagulation of the blood; but this I have not yet positively ascertained by experiment, although I am led to conclude that such is the fact, from some remarks made by Dr. Apjohn, in the article Galvanism, in the Cyclopaedia of Practical Medicine.

In my previous remarks, gentlemen, I must be understood to refer
to those cases of hemorrhage where the placenta is not placed over or near the os uteri; but I shall now proceed to speak of those cases in which uterine contraction has a tendency to increase the discharge, cases which are usually described as belonging to the class, unavoidable hemorrhage. In these cases, where the peculiar location of the placenta deprives us of the benefits that usually accrue from uterine contraction, and as it is the special influence of galvanism to produce this effect, it ought to be the object of the obstetrician so to modify his practice, as to place them within the range of this remedy. Before entering upon a description of the plan which I would recommend to be adopted in these cases, I shall first direct your attention to the practice of the older writers; and secondly, refer to the mode in which nature sometimes terminates them when left to herself. In looking over the authorities from 1612 to 1790, we find that they vary in their practice. Some recommend the removal of the placenta before the child; others advise the same course conditionally, that is, providing it is offering itself very largely or decidedly to the finger of the attendant; others again, say that where it cannot be pushed back, it should be brought away before the child. It must be understood that many of these writers had not a correct knowledge of the true anatomical condition of parts in cases of placenta pravia, and I do not think it necessary to enumerate their names, as it would be occupying too much of your valuable time. You will find that in some of these cases, where the placenta was brought away before the child, according to the statement of these writers, the latter was even born alive, and in most of them the hemorrhage was suppressed. And whilst on this subject, I may call your attention to a few cases of more recent occurrence, where this practice has been adopted. It happened to me in 1819, to have a case of placental presentation, where I detached the placenta, because it was hanging down so low in the vagina, that there was no chance of doing any thing else; the hemorrhage was immediately suppressed, and the child expelled by the natural efforts. I am also indebted to my friend Mr. Jesse, who is present, for the details of a case in which he detached the placenta, and in which the hemorrhage thereupon subsided. It was the practice of the late Mr. Kinder Wood, of this hospital, in many of these cases, to detach and bring away the placenta, and afterwards to leave them to the operation of nature, or to extract the child by the feet, as the case demanded. A case also occurred to Mr. Wilson, of this town, who kindly related the circumstances to me; the placenta had been rudely brought away by the attendant, and Mr. Wilson found the patient in a state of exhaustion, with the child still in utero. He extracted the child a considerable time after the removal of the placenta. It has occurred to me, in my hospital practice, to find that the placenta had been brought down in mistake by the midwives in these cases, and this without causing an increase of the flooding.

Smellie mentions cases in which the placenta was brought away,
and where the hemorrhage subsided. In Dr. Collins's Reports of the Dublin Lying-in Hospital, there is a case in which the placenta was brought away by the midwife the evening before the admission of the patient into the hospital, and the hemorrhage was thereby suppressed. Baudelouque relates a somewhat similar case. And now let us consider the method in which nature sometimes terminates labours where there exists placenta praevia; and for this purpose I have, without any great pains, collected 36 cases, illustrative of her powers in separating and expelling the placenta before the child.

Giffard mentions one case; Perfect, one case; Smellie, four cases; Chapman, one case; Ramsbotham, sen., six cases; Merriman, one case: Hamilton, two cases; Collins, one case; Barlow, one case; Dr. Robert Lee, two cases; Gower, one case; Millington, one case; Bailey, one case; Wood, three cases; Lowe, one case; Huut, one case; Wm. Lowe, three cases; Dorrington, two cases; and I have met with three cases of the same nature myself. Besides these, Mr. Jesse has related to me a case of placenta praevia, where the entire ovum was expelled; Mr. James Kenworthy, a similar case; and the late Dr. Rigby has published a case also. Now, the bulk of these cases, gentlemen, have been detailed without any specific practical object, and consequently are more valuable to my present purpose than if they had occurred to myself, and had been brought forward to serve my own particular views. You may refer to many of them yourselves; and you will find in nearly all of them that the hemorrhage was suppressed immediately after the placenta was thrown off.

These cases, then, and the practice already referred to, as adopted by the older writers, and several modern obstetricians, appear to me to furnish data of a most important character, whereupon a practice, adapted to cases of exhaustion from unavoidable hemorrhage, may be based, in order to bring them within the sphere of the application of galvanism. And before entering upon a description of my proposed plan of managing these cases, I beg to remind you that it is an established fact, that partial separation of the placenta, whether in simple or in complicated retention of that organ after labour, or in placenta praevia, is attended with far more profuse bleeding than total separation.

In the early part of the lecture, I stated that one means of adding to the exhaustion already existing, is the evacuation of the uterus, whether that evacuation be partial or entire; therefore I consider that in these cases of placental presentation, it would be a decidedly important point of practice to draw off the liquor amnii gradually, as the first step in the management of the case. For this purpose I have somewhat modified Mr. Holmes's instrument for perforating the membranes, making the canula much larger, and having an oval aperture placed on each side near its open extremity. The entire instrument consists of a canula and trocar, which latter always lies concealed within the canula, by means of a spiral spring, except when pushed out by pressure on its button-like extremity. This trocar can
be entirely withdrawn from the canula, so as to leave the latter free for the passage of fluid. Now I propose to pass this instrument through the placenta into the amniotic bag, and then remove the trocar, so that the liquor amnii may escape, a plan which I prefer to rupturing the membranes at the side of the placenta, because the water in the latter case would flow too rapidly, on account of the practitioner not being able to limit the size of the opening he might make, and also because by the plan now recommended, the integrity of the membranes being preserved, the placenta is thereby maintained in a better position for acting as a tampon against the open venous apertures when the head comes to press upon it.

In rupturing the membranes in the ordinary method, it is quite obvious that as the connection between the membranes and placenta is broken, the latter is liable to fall down more or less into the vagina. Having thus drawn off the liquor amnii, the next step will be to introduce the hand into the vagina, then to pass the fingers to the edge of the placenta, and carrying them on between it and the os uteri, to sweep the hand round its whole circumference, so as completely to detach the placental mass, care being taken to avoid rupturing the membranes. We have now brought the case into such a state as to be within the influence of galvanism; for although this practice of detaching the placenta may be a means of suppressing the bleeding, yet it will not restore the depressed powers of the woman; and on that account we still require an agent to induce such a degree of uterine contraction as will secure her from all chances of further hemorrhage, while we have recourse to such measures as will tend to support her strength.

In order, then, to insure uterine contraction, we must have recourse to galvanism, and the subsequent management of the case must be conducted on ordinary principles, such as supporting the woman by stimulants, nutritious articles of diet, and transfusion. The delivery should be deferred until the powers of the patient are so far rallied as to justify its being undertaken, however long the interval may be; and that mode adopted which makes the least demand upon her constitutional powers. It may happen that a repetition of the galvanic shocks may, after a certain period, induce such uterine action as will expel the whole of the contents of the organ; and if this should not happen, it appears to me that it would be the best practice, to apply the long forceps, having previously removed the placenta, that is if the head presents. If any other part of the child presents, the case must be managed on ordinary principles.

The novelty of these views may produce an impression unfavorable to their proper estimation, but I hope, gentlemen, you will recollect that it has been my object to bring them before the profession in order that their correctness may be tested. I wish to benefit poor suffering women in their hour of danger, and to be candid in my communications to my professional brethren. In my own mind I am satisfied as to the influence of galvanism, and its power of pro-
ducing uterine contraction. I am also convinced that it has no evil
influence on the life of the child in utero, and after its birth that it
is an important means of resuscitation in cases of asphyxia. Ob-
jections may be raised that we have not always the apparatus at
hand. The answer to this objection is the same as that which refers
to the application of all instrumental means. In my opinion, no
gentleman who possesses the principles of a correct obstetrician,
would carry his forceps, vectis, perforator, crotchet, or transfusion
apparatus along with him. These things are to be sent for in emer-
gencies only, and the same remark applies to the galvanic apparatus.

My remarks have hitherto been confined to the treatment of those
cases of hemorrhage that are attended with exhaustion before deliv-
ery, but there are other cases to which galvanism is equally applica-
bale. If we investigate the cases given by authors, we shall find that
there are many cases of accidental hemorrhage before delivery, where
artificial rupture of the membranes has not succeeded in arresting
the discharge, on which account several writers, Burns and Hamilton
amongst them, advocate delivery in preference to this operation.
Now, the artificial rupture of the membranes is recommended for
adoption without reference to the condition of the os uteri; and it
must be obvious, if this part is rigid and undilatable, and the flooding
should continue although the membranes have been ruptured, that it
would be highly hazardous to introduce the hand and to deliver by
force. In such a case galvanism would place the woman in a state
of security, by exciting the contraction of the uterus. I also consid-
er that this would be useful in some of the hemorrhages of the early
months of pregnancy.

With regard to the after hemorrhages, especially those attended
by exhaustion, I consider it particularly applicable where atony of the
uterus is the principal feature of the accident. In those cases which
occur previous to the expulsion of the placenta, it would be the duty
of the practitioner to assure himself that this mass was not morbidly
adherent to the sides of the uterus.

In hour-glass contraction, and other forms of irregular uterine ac-
tion after labour, I anticipate great benefit from its use. In these
cases there is a loss of balance between the contractile power of dif-
ferent parts of the uterine fibre, one part being in a state of atony,
whilst the other is in a state of firm contraction. Now, if the gal-
vanic current be directed in the longitudinal axis of the organ, it
strikes me that you might excite the longitudinal fibres to contrac-
tion, and thereby restore the balance.

There are several other topics not directly connected with the
subject of this evening’s lecture which I shall slightly notice, in re-
ference to galvanism. I am satisfied from positive trial of the reme-
dy, that it will be found a most important agent in tedious labour,
depending upon want of power in the uterus, and where no mecha-
nical obstacle exists. I would also suggest the probability of its prov-
ing valuable in originating uterine action de novo, in cases where it
may be considered necessary to induce premature labour. It seems to me also to be worthy of trial in certain cases of menorrhagia in the ungravid state, where, on vaginal examination, the uterus is found to be atonic, as evidenced by its large flaccid condition, and the paturous state of the os uteri.

Having made this digression, it is proper that I should remark, in reference to cases of hemorrhage, that I am not urging this plan of treatment upon the profession, with the view of superseding the ordinary means, but rather with the view of supplying a remedy in those extreme cases where these have failed. I do unhesitatingly say that the obstetrician has the power in most cases to control uterine hemorrhage, so as to prevent them ever reaching this extreme state of exhaustion. But, nevertheless, we do meet with this condition frequently in a large hospital practice, and also in private consultation practice. A number of cases have come to my knowledge within a very few months, where death have resulted from this excessive exhaustion. I therefore say that we ought to have some more certain means than delivery to depend upon in these cases; for, if this expedient be so important a means of saving life, how is it that it so often fails?

With regard to the mode of applying galvanism in these cases, I have used an electro-magnetic apparatus, contrived by Messrs. Abraham and Dancer, of this town, for medical and other purposes. It consists of a battery in a small jar, and a helix with conductors. For the sake of convenience, the latter are connected with the helix by means of long wires covered with an isolating material. The strength of the shock is regulated by a small contrivance situated on the stand of the helix, by means of which it can be either diminished or increased. One of the conductors, which is applied externally, has a hollow wooden handle, through which passes the wire before alluded to, in order to join a brass stem terminating at its extremity in a ball. The other conductor, which is contrived by myself, consists of a strong brass stem, seven inches long, curved to suit the vagina, and covered with a non-conducting material, having a small screw at its distal extremity for attaching it to a silver ball; at its other extremity it is received within an ebony handle, which is hollow, and through which passes a strong brass wire, looped at the end, and connected with the long wires before alluded to. This wire is kept disconnected from the brass stem by means of a spiral spring concealed within the ebony handle. The loop is covered with silk, and is intended for the thumb of the operator, when he is bringing the wire into connexion with the stem.

When the remedy is applied, the brass ball of the vaginal conductor is to be passed up to the os uteri, and moved about at intervals, on to various parts of this organ. At the same time the other conductor must be applied to the abdominal parietes over the fundus uteri. Shocks may be also passed transversely through the uterus by simultaneously applying the conductor on each side of the belly.
The application should be used at intervals, so as to approximate in its effects as nearly as possible to the natural pains. It may be continued until it meets the exigencies of the case.

An Account of the Epidemic Erysipelas; with Cases. By R. G. Wharton, M. D., of Grand Gulf, Mississippi. (From the New Orleans Medical and Surgical Journal.)

During the months of April and May, 1844, and the first quarter of the present year, the town of Grand Gulf suffered very much from an epidemic, which has been described very properly by Drs. Hall and Dexter in the January No. (1844,) of the American Journal of Medical Sciences, as an erysipelatous fever; the same disease has, since that time, prevailed very extensively in isolated localities throughout most parts of the United States, and even now, is sweeping with unabated violence over many parts of this State. It has assumed in no place a more malignant form than it did in this town; and I am, consequently, enabled to give a description from observation of a form of disease, which whether we regard its frightful appearance, or, in many cases, its intractableness to all remedial means, is unsurpassed by cholera. The name of black tongue, accorded to it in the newspapers, was well calculated to inspire terror at its approach, and though unappropriate and vague, that very vagueness rendered it more fearful.

It attacks in so many different forms, and assumes such a variety of appearances, that it is impossible to give any description which will apply to all cases. The first cases assumed the form of acute laryngitis of the most obstinate kind, and several proved fatal in spite of the most active depletion by the lancet, frequent emetics of tartar emetic, warm baths, and blisters to the throat. At the time, I did not suspect this inflammation to be of the erysipelatous kind, but in a short time I became convinced that it was. These cases occurred in March, 1844. Early in April, several were suddenly seized with violent fever, swelling and slight redness of the parotid glands, headache, drowsiness almost approaching to stupor, severe pain in the ear and pains in the limbs. In the course of 36 to 48 hours, the swelling and inflammation extended from the parotid to the larynx, producing all the symptoms of acute laryngitis, such as great difficulty and pain in deglutition, which was performed with a convulsive effort, and with a gurgling sound; small quick pulse, tenderness on pressure of the larynx, anxious countenance, &c.

After these symptoms had continued for two or three days, or had been somewhat relieved, a slight swelling and great tenderness and redness might be seen in some part of the face, generally about the
ear or in the ear—sometimes about the nose; the throat symptoms, though much slighter, still harrassed the patient; there was a constant hawking up of a tough mucus, and a difficulty of deglutition different from that first experienced, and now depending apparently on a paralysis of the muscles of the throat. The uvula and velum were of a dark purple, and very much swollen; also the tonsils in many cases; the pulse rose very much in frequency as the swelling of the face progressed; and the drowsiness or stupor also kept pace with it. The swelling extended rapidly, and involved, in most cases, the whole of the face, ears, forehead, and, in a few cases, the whole scalp, sometimes extending down the breast or back. In these cases there was total blindness for five or six days from the swollen state of the face and eyelids; and the patient generally lay either drowsy, with a muttering delirium, or stupid; feet and hands cool or cold; head hot; with great pulsation of the carotids. The pulse is now very weak and rapid, and it is with the utmost difficulty, that the patient takes any medicine or water. In favorable cases, the swelling gradually subsides, first on that side of the face on which it commenced; a copious secretion of purulent matter forms under the cuticle: the eyes open; fever gradually abates; and in the course of eleven to fifteen days the patient is convalescent. It may prove fatal in the early stage, (if not actively and promptly treated,) from suffocation. Laryngeal symptoms in the swelling even may subside, and matter may be freely secreted, yet there is an absolute impossibility of swallowing, from the paralysis of the muscles of deglutition; nervous symptoms supervene—tremors; inability of urinating, and the patient dies about the tenth day, sometimes as late as the fifteenth.

This was the form the first cases assumed; but soon after others occurred, in which the first symptoms were precisely similar to those above detailed; there was violent fever; pain and swelling of the parotids. Sometimes, however, these glands were unaffected, the disease attacking the muscles and tendons on the side of the neck, causing the most excruciating pain, swelling and tenderness on pressure; there was soreness of the throat, pain and difficulty of deglutition, the fauces were of a dark or livid color, the tonsils were enlarged, and patches of ulceration might be observed, or a tough mucus, which looked like ulcers. In these cases there were severe pains felt in different parts of the body, generally on top of one or both shoulders, shooting up the sides of the neck; sometimes there was violent pain in the feet and legs. Numbness of limbs was a very general symptom. Though these cases constituted a much milder form of the disease than the first, the pains were often excruciating, the fever very high, with a pulse always frequent, sometimes strong and full.

Sometimes, without any external inflammation, the disease attacked the lungs, producing the most malignant form of pneumonia; sometimes the stomach and bowels, producing the most intractible form of gastritis or enteritis. We consider these to be cases of ery-
sipelatous inflammation, because they appeared at the same time, in the same families, some members of which were attacked in this manner, others with the other forms of the disease; and because these are symptoms common to nearly every form of it. I had one patient who was attacked in the usual manner, with chill and high fever, violent pain in the side of the neck, with soreness, pain, and difficulty of deglutition, pains in the limbs. He was relieved in the course of four or five days; when, from imprudent exposure to the sun, he relapsed, and the disease attacked the lungs, stomach and bowels; producing pneumonia with gastro-enteritis, which nothing could relieve. In the relapse there was severe pain in the neck, and sore throat. Again, in other cases, after suffering for two or three days in a slight degree with fever, pain in the neck, and sore throat, the patient was attacked in the stomach with nausea and vomiting, and other symptoms of gastritis which was, as far as I have seen and heard, always fatal. When the viscera, lungs, stomach, or bowels were the seat of the disease, I have never yet seen a case recover. It generally attacked these organs when the patient was in general bad health, was addicted to habits of intemperance, or dyspeptic; always attacking the weakest organ. In these visceral cases there was a degree of malignancy which I have never before witnessed in any disease. In the course of a very few hours the countenance is entirely changed and collapsed; the pulse not very weak and not very frequent; the prostration of strength astonishing. You may bleed—which, however, must be cautiously done; cup, bathe and blister; and though you reduce the patient by these means as much as you dare, he still complains that the pain is only partially relieved, and the disease proceeds with more or less rapidity to a fatal termination, while the physician can scarcely even palliate symptoms.

I had a number of slight cases characterized by chill, fever, pains and numbness in the arms and legs, pain and soreness in the side of the neck, slight soreness of the throat. These were generally relieved in the course of four or five days; the patient, however, was left in a very weak and languid condition for several weeks.

The tongue, in most cases, where the stomach was not particularly affected, was not much changed from its natural state; sometimes it was dry and glazed, and in a few cases it was covered from the beginning, with a heavy coat of dark fur.

I saw several cases where the violence of the disease was concentrated in the muscles of the neck, causing the most exquisite tenderness and swelling, which often, in the course of two or three hours, was as large as a hen’s egg; this swelling and tenderness would remain stationary for several days, and then disappear, or disperse, by extending in the form of erysipelas of the skin around the neck.

In all forms of the disease there was a remarkable tendency to relapse. Often, when the patient was apparently out of danger, the slightest imprudence was sufficient to produce a relapse of the most formidable kind.
The question whether or not it be contagious, was much agitated on its first appearance here; sufficient proof, however, has since that time accumulated to convince the most sceptical that under certain circumstances it is contagious. It may be taken by inoculation; several cases of this kind have occurred in this county. One of them was that of a physician, who lost his life in consequence. When proper cleanliness and ventilation are neglected, it is very apt to be communicated to the nurses and attendants. This is not peculiar, however, to this disease, but is common to it with many others not usually considered very contagious. By observing the precautions of cleanliness and free ventilation, every member of one family, the head of which had a most violent attack, escaped entirely; whilst in another family, where these wholesome safeguards were neglected, the disease attacked every member, several of them more than once. I have thought that those cases where the throat was deeply affected were most contagious; probably from the fact that the breath of the patient is then more highly charged with the morbid miasm.

**Prognosis.** Those cases where the viscera are attacked, are, so far as I have seen or heard, been always fatal, and especially if our remedies produce only a partial relief. While the pulse is weak and compressible the prognosis is unfavorable. Next in the order of malignancy are those in which there is deep seated disease, swelling and ulceration of the throat, while the face is swollen at the same time. In these cases, if the mind remains clear; if our remedies, especially emetics, are borne well, and if the pulse, though small and rapid, does not give way; and if the nerves are not much affected; though most dreadful, we may entertain a reasonable hope of recovery. The intemperate, and those delicate constitutions whose viscera are unsound, and those of advanced age, are those most likely to succumb under an attack.

**Treatment.** From the description which has been given of the various forms which this disease assumes, it will at once be readily understood that considerable modification is required in the remedies in consequence of this variety; and that, like all other disease, it must be treated according to the indications in each particular case. When the erysipelas attacked the face and head; and when the throat was at the same time affected, as was the case when the disease first appeared; if the pulse was full and strong, as it was in nearly every instance, free and early depletion with the lancet was indispensable. I had to bleed most of those who suffered under this form of the disease twice, with most happy effect. A few cases occurred in this form in old and debilitated, or intemperate subjects who could not bear the lancet. The next remedy, and a most important one it is, is the free exhibition of antimonial emetics; the laryngeal symptoms here were most urgent, and nothing has such a controlling power over them as tartar emetic. Besides relieving the patient of the symptoms of suffocation, which were most distressing
and alarming, the frequent exhibition of emetics had a most happy effect in keeping down the arterial excitement, which ran high; it equalized the circulation, and removed the stupor caused by so great a determination of blood to the head. This emetic, or nauseating course, I had to pursue in some instances for three, four, or even five days.

The throat required some especial remedies; and when the velum and uvula were swollen, as it was in many cases very much from the commencement; free and deep incisions were necessary to relieve the patient of the difficulty of breathing and deglutition; and after this had been done, or without it, when the parts were not much swollen, but very sore and ulcerated, a strong solution of argent. nitrat. (3i. to 3i. water.) as recommended by Tissot in chronic laryngitis, was applied to the throat by means of a mop or sponge fastened to the end of a whalebone, being careful to make the patient take a little salt and water in case any of the solution might be swallowed. I saw several cases where the uvula and velum were so enormously swollen as almost to impede the entrance of air into the larynx. By free and deep incisions a large quantity of purulent matter was discharged, to the great relief of the patient.

Many of these cases were most distressing to witness; the patient lay drowsy or perfectly stupid, snoring, his face enormously swollen, and of a dark purple color, almost black, so that it would be impossible for his friends to recognize him; eyes closed, a constant sense of suffocation, extreme difficulty (sometimests, for seven or eight hours, an actual impossibility) of swallowing, and it was necessary to raise him to a sitting posture every time he attempted to swallow. This motion almost exhausted him. The pulse is weak and rapid, and altogether the case appears desperate. After remaining in this apparently hopeless condition from 24 to 48 hours, the throat appears a little better; the patient can, by great exertion, take a little water; and now a state of collapse or great debility occurs; and by the cautious exhibition of carb. ammon. and quinine, the pulse becomes firmer, more steady, the swelling of the face rapidly subsides, and with the improvement in swallowing there is a return of appetite.

The convalescence is most tedious; desquamation of the cuticle takes place; large collections of pus form under the cuticle, as well as in the deep seated cellular substance, requiring deep incisions to the bone to discharge it. For a long time the patients looked badly; the skin was red and claret colored, like that of a patient recovering from the small-pox.

In those forms of the disease where the internal organs were attacked, though the indications were plain, unfortunately medicine afforded only a temporary relief. The pulse in these cases was weak and soft; and though the severe pain seemed to require venesection, great caution was necessary in its use, on account of the prostration of the general system. I bled, however, a majority of the patients attacked with this form of the disease, and some of them two or
three times, and yet I could attribute only a very temporary amelioration of symptoms to it.

Cupping was resorted to, and carried as far as could be borne; and this, too, afforded only a partial relief.

Hot mustard baths was the remedy on which I placed the greatest reliance, both on the general principle of a strong revulsion, and especially because it appeared to be the only remedy which afforded more than a very slight mitigation of the patients' sufferings. I usually ordered it from three to six times in the 24 hours, and continued it each time, as long as the patient could bear it.

Large blisters were applied over the seat of the pain, and in most cases it was difficult to get them to draw; like all the other remedies, however, they afforded little, or only a very partial and temporary relief.

Calomel and opium, in large doses, were used in addition to the revulsive means; and this, too, instead of doing good in many cases, evidently aggravated the symptoms, inducing irritation in the bowels, and great distress; and thus, in spite of every rational resource, we were destined to see our patients, in the midst of the most horrid tortures, snatched away by the relentless hand of the scourger.

In some of these cases, however, towards the close of the disease the patients sunk into a state of quiet delirium, unconscious of every thing; and with little suffering, breathed their last; the sensibilities having been previously exhausted by the violence of the pains. In one case that I saw, the force of the disease was concentrated on the feet and legs, producing the most excruciating pains, as severe as an attack of the gout, extending up the body; with great restlessness, fever, full and strong pulse. In this case I bled freely; and at the suggestion of my friend, Dr. Wilson, of Port Gibson, (who saw many of these cases with me, and whose practical suggestions in all cases of disease are characterized by a discriminating fact rarely met with,) had the patient's feet and legs immersed in a hot lime bath, made by dissolving one gallon of lime in four gallons of hot water. This had a most happy effect in relieving the pains, and, together with other means, which were indicated, soon restored the patient to health. There were a number of cases comparatively mild where the violence of the disease was spent on the face and head, producing fever and pain of the face, which was so much swollen that the person could not be recognised, nor see at all for several days. The patients were very drowsy—constantly in a state of muttering delirium; the feet and legs disposed to be very cold, with great heat of head. In these cases the throat was unaffected; consequently there was no difficulty of deglutition; the pulse, though frequent, being sufficiently firm; there was, besides, no malignancy. A very simple course of treatment was sufficient for these. Mild saline purgatives, the constant application of cold cloths to the head, and hot mustard baths to the feet and legs, wherever there was much delirium or stupor; these were the means which being persevered in for six to ten days,
would always bring the case to a favorable issue. A mild anodyne at night was sometimes required in the latter stages of these cases. 

There were a number of other cases in which the patients complained of severe pains in the sides of the neck, shooting down the arms; soreness of throat, with considerable difficulty of deglutition; fever, severe headache, numbness of the limbs, and a great depression of spirits, attributable in part to the alarm occasioned by the prevalence of the epidemic. The stomach was generally irritable; the tongue red; pulse weak, and rather frequent. All these cases were successfully treated by hot mustard baths, and copious draughts of a strong hot infusion of eupatorium perfoliatum, which produced a copious perspiration, which was kept up for two or three days, to the great relief of the patient.

I have said nothing as yet about the local treatment for the erysipelas when it attacks the surface, being well convinced from large experience that no local applications have any great effect in the worst cases, and in the milder cases they are not much required. I have, however, in nearly every case endeavored to arrest the progress of inflammation by surrounding it with blisters, or cauterising the skin around with argent. nit. In many cases the disease was arrested by the lines drawn around it; but in the bad cases where such effects were most desired, they did no good—the inflammation extending as rapidly as if they had not been applied. I have covered the face with mercurial ointment, and have applied nearly every kind of lotion, and from the result of this experience have as much faith in cold water as in any other one remedy. Still it is well to try a variety of them, as there are some patients who receive more benefit from certain lotions than others. For this purpose we may use solutions of sal. ammon., plumb. acet., a mixture of equal parts of alcohol and ether, &c.

Case 1st.—April 6th, 1844, called to see Mr. T. A. Applegate, who was the first one attacked with the erysipelas of the surface. He was taken down the day previous with high fever, swelling of the parotid glands, inability to protrude the tongue. He was very restless—severe headache—tender on pressure over præcordia—drowsy, and rather stupid. Bled to 3 xvi, cupped over the head, and ordered warm bath. 9. P. M.—Bath produced perspiration, but the fever continued high. 7th. Rather better this morning; still considerable fever; gave mass. hyd. grs. xii. At 7 P. M. not much better; complains of general fullness about the head; ordered blister to nape of neck. Was called up at one o'clock, A. M.—found him laboring under acute laryngitis, the inflammation having extended from the parotids, which were still very much swollen and inflamed. There was considerable difficulty of deglutition, which was performed with a convulsive effort, and with a gurgling noise; there was also tenderness on pressure of the top of the larynx. Used frictions of Granville's liniment to the throat, without benefit. At 4 A. M. he was much worse; gave emetic of tartar and ipecac, which af-
Epidemic Erysipelas, with Cases.

forded considerable though temporary relief. 8th, at 6 A. M., in a very bad condition; countenance frowning; extreme pain in swallowing; pulse quick and tense; frequent watery discharges from the bowels. Bleed to 3/4; ordered laudanum enema, and applied emollient poultices of onions, tansy and rue, as hot as they could be borne, changing them every fifteen minutes. The poultices had a most happy effect in relieving the urgency of the laryngeal symptoms; much better than blisters to the throat, which I now never use in such cases. At 12 M. still improving, can swallow without that convulsive effort so characteristic of laryngitis. At 3 P. M. pulse 100, soft; free perspiration—gave 10 grains Dover's powder at bedtime. 9th. Slept well—pulse 90, soft; feels much better, still there is considerable pain in swallowing; has much thirst. Ordered 1/2 grain tartar. antim. every two hours, and the hot poultices to be continued to the throat. Visit at 9 P. M. He had vomited two or three times during the day; spits frequently a tough mucus which is secreted in large quantities; pulse 100, quiet; had two operations; ordered 6 grains Dover's powder; discontinued the poultices. 10th. Passed a tolerable night. At 3 P. M., he was rather drowsy and stupid; pulse 110. Ordered the solution of tartar every two hours; this reduced the pulse to 104 by 9 P. M. and produced free secretion from the throat, which appears to be almost entirely relieved. There is still, however, a great determination to the head with considerable discharge from the nostrils. He complains of tenderness and swelling of the left side of the face, in front of the ears. 11th. Face still swelling on the left side. Ordered the tartar water during the day; at night gave hyd. chlorid. mit. grs. vi.; pulv. jalap gr. iv. to relieve the bowels. 12th. The face very much swollen this morning; pulse 110; medicine acted well on the bowels, with some relief; scarified the velum and uvula, which were very much swollen, and impeded the passage of air. I now became aware of the necessity of arresting, if possible, the extension of the erysipelas, and for this purpose surrounded the inflamed parts with strips of emplast. episp., about 1 1/2 inches broad, and covered the face with unguent hydrat. At 7 o'clock, A. M., no better; pulse 116; gave hyd. chlorid. mit. grs. viij. 13th. Medicine taken last night operated once; pulse 100; blisters drew well; face still more swollen; quiet, disposed to sleep. 3 P. M., pulse 120; still drowsy, intelligent when aroused; great difficulty of swallowing from apparent immobility or paralysis of the muscles of mouth and throat. Ordered carb. amm. of which he took two doses without any good effects. 14th. Passed a tolerable night; pulse during the last night varied from 120 to 112, changing every half hour; it is now 112. Ordered 2 grains quinine every three hours; this had a fine effect; under its use the pulse became firmer and more steady. 15th. Much better; pulse 108; continued quinine; the swelling is now abating; swallowing much better. Ordered light broths, with a little wine whey. 16th. Improving rapidly; pulse 88; continued qui-
nine every two hours. 17th. Pulse 82; quinine, broths, wine
whey; at bedtime ordered a dose of laudanum to quiet the bowels.
He was now rapidly recovering, and in the course of four or five
days was able to sit up. Large quantities of purulent matter formed
on the cheek bone and between the upper eyelids, which had to be
opened with a lancet.

Case 2d.—The following case has some peculiarities, worthy of
notice. It is the only one that I saw where the tongue was so much
affected. June 5th, at eleven, A. M., called to see W. Gott, a boy
aged sixteen, who had returned from school about two hours before,
complaining very much of his tongue, which he said felt very sore,
and was swelling rapidly. Found him with a frequent pulse, rather
hot skin, complaining of his tongue as well as a pain on each side of
neck, the surface of which looked a little red, and was painfully sen-
sitive to the slightest touch. The tip of the tongue for an inch was
very much swollen, and there were several white specks on it. Or-
dered warm mustard baths, blisters to the painful surface of the neck,
red pepper tea as a drink, and as a gargle or mouth wash. At four
P. M. he was much worse, his tongue enormously swollen, so that his
jaws could not be closed, and he could not speak; great difficulty of
swallowing, mind stupid, does not complain of pain in the tongue.
Pulse 120, and very small; great heat of skin. Ordered mustard
bath again—in two hours bled to 3½, cupped on back of neck and
behind the ears, to relieve the determination to the head. I request-
ed Dr. Wilson, of Port Gibson, to meet me; we applied a strong
solution of argent. nit. to the fauces, which appeared ulcerated and
dark colored, and scarified deeply under the tongue. At midnight
ordered another bath, and gave strong infusion of serpentaria and
chamomile flowers. 6th.—Somewhat better this morning; head
clearer; pulse 120, and rather small; continued the infusion. Swell-
ing of the tongue subsided, so that he could articulate. Throat
better; repeated the caustic, and gave a cathartic last night of sulph.
magnes. which operated well. There was not much change during
the day—at midnight was sent for in haste, and found him suffering
from intense pain of the throat, so that every breath caused him to
cry out; pulse 120, weak and quick, skin moderately hot—mind not
clear. Ordered him to be put in a mustard bath for twenty or thirty
minutes, and a large blister to be applied to the abdomen. 7th.—
Somewhat easier, though not relieved of the pain. Countenance
bad—sleeps with eyes half open—rather delirious; pulse 130, weak
and irritable. Continue the chamomile and serpentaria with eupa-
torium. Towards evening became much worse; the pain left the
stomach and bowels, and attacked the throat, so that every inspira-
tion caused him to cry out as if he had been stabbed. The pain was
deep seated, and changed its seat constantly—first on the right, then
on the left side; pulse 140, weak and quick; countenance more
cadaverous. Again used the hot bath, as it was the only remedy
which seemed to afford even a temporary respite to his agony. The
skin having relaxed, added 3 grains quinine to the other medicines. 
8th.—Pulse intermitting; delirious all night; skin cool and relaxed; 
talks coherently when roused; pain still severe, though much light-
er; pulse 140 to 150; gave the quinine in large doses, but as it did 
no good, and he was sinking fast, discontinued every thing. He 
expired about day, on the morning of the 9th. This boy was appa-
rently of a good constitution. His family had suffered very much 
from the erysipelas for six or seven weeks, and his was the last case 
that occurred during the last year. The attack appears to have 
been brought on by his bathing in a muddy pond of water during 
the heat of the day.

Case 3d.—April 26th, 1844. Visited Mr. Calahan, who was 
suffering with acute pains in the feet and legs, arms, stomach and 
bowels. Pulse 85; stomach tender on pressure; tongue clear and 
rather red; no headache. As he had taken some cathartic pills over 
night which operated harshly, ordered nothing but a hot bath. 
At 7, P. M., the bath had not relieved the pains, which were very 
severe in the abdomen. Cupped very extensively. 27th. Passed 
a very restless night; the pains are very severe in the hollow of 
both feet, and in both big toes, one spot being particularly painful. 
The pain extends from this up the legs and thighs; pulse 80, and 
rather full; skin hot; very restless. Bled to 5 a xiv; put him into a 
hot bath. 11, A. M. The bath relieved him for one or two hours; 
as the pain in the abdomen is severe, cupped again, and gave the 
following: B. mass. hyd. grs. vi., extract comii. grs. iii. M.; or-
dered the bath again at 1, P. M. At 2½, P. M., more quiet, and 
easier than he had been; dozes occasionally; pulse 80, and softer. 
Says the pains are much slighter, though still severe. Ordered the 
same dose at 4, P. M. At 6, P. M., complains very much of the 
pain in his feet and legs, which is very excruciating; has a most 
distressing nausea and vomiting. Requested Dr. Wilson to see him. 
We had his feet and legs immersed in a hot lime bath several times 
during the night, and applied a large blister to the abdomen. The 
bath relieved the pain very much; the nausea was partly relieved by 
the blister. 28th. Slept very little, skin hot; pulse 85; complains 
still of nausea. Gave sulph. morph. gr. i, and as soon as the stom-
ach is composed, ordered hot infusion of eupatorium perfoliatum and 
a general warm bath. These means relieved him very much. At 
8, P. M., complained of inability of urinating—relieved by sp. æth. 
nit. and emollient fomentations over the bladder. 29th. Slept rather 
badly, feverish, some pain in the abdomen. Another bath, with the 
infusion of eupatorium. This again relieved him, and in a day or 
two he was convalescent. This case differed very much from the 
ordinary forms of the disease; still I class it with them as it occurred 
at the same time, and in a family where several others were then suf-
fering with the more common forms of the disease. I have seldom 
seen a patient suffer more than did this one from the pain in the feet 
and legs, and I feel confident that without prompt treatment he 
would have sunk under it.
BIBLIOGRAPHICAL NOTICES.

A new edition of "Ramsbotham's Process of Parturition."—Messrs. Lea & Blanchard have recently re-published the last London edition of this invaluable work, carefully revised and considerably enlarged. Ramsbotham's Process of Parturition, has been so long and favorably known to the profession in the United States, that it needs no commendation. It certainly stands at the head of the long list of excellent obstetric works published within the last few years in Great Britain, Ireland and continental Europe. So far as respects the science and practice of midwifery, both in description and demonstration, it is comprehensive and complete, leaving little if any farther to be desired in this department. We consider this book indispensable to the library of every physician engaged in the practice of midwifery.

The present edition contains six additional figures, and fifty-nine pages of interesting and useful matter, worth alone the price of the whole work.

J. A. E.

A new edition of Professor Meigs' Translation of Velpeau's Midwifery; with notes and additions, by William Harris, M. D. Published by Messrs. Lindsay & Blackiston, Philadelphia.—If the reputation of this work, were not already sufficiently established in the United States, the names of Velpeau and Meigs would be ample recommendation; but we can with propriety and truth say, that it is rendered much more perfect and valuable by Dr. Harris' interesting and useful notes and additions.

J. A. E.

PART III.—MONTHLY PERISCOPE.

The chemical phenomena of Digestion.—MM Bernard de Villefranche and Barreswill, whose researches on digestion we some time since published in the Lancet, have addressed another communication to the French Academy, in which they observe, "We formerly stated that the gastric juice contains two active principles, 1° free lactic acid, 2° an organic matter, which is precipitated and destroyed by a heat of 85°, or 90° cent. It is the presence of this organic matter which gives the gastric juice its digestive power, since it loses
this power, when the said matter is destroyed by an elevated temperature.

One of the remarkable properties of this organic matter is, that its digestive powers vary, according as it is associated with a fluid having an acid or an alkaline reaction. Thus, in the gastric juice, which is acid, it readily dissolves (as is well known) azotized substances, fibrin, gluten, albumen, &c., whilst it is altogether without action on starch.

The object of the present paper is to show, that if we destroy this acid reaction of gastric juice, and render it alkaline by the addition of carbonate of soda, its active organic matter, being now in presence of an alkaline fluid, changes its physiological action, and becomes able rapidly to modify starch, whilst it loses its power of digesting meat and azotized substances. As the latter is exactly the character of saliva and the pancreatic fluid, it was interesting to know whether a change in the chemical reaction of these two fluids would produce in them the same change of properties as in the gastric juice. Our experience has demonstrated that it does so. If we render the pancreatic fluid, or the saliva, (which are both naturally alkaline,) acid, we invert their ordinary action, and give them the power of dissolving meat and azotized substances, whilst they lose their influence upon starch.

The numerous and varied experiments related in this memoir fully support these assertions, and prove that in the gastric juice, the pancreatic fluid, and the saliva, exists an organic principle, an active agent of digestion, which is common to all of them, and that it is the nature of the chemical reaction associated with it, which alone determines their power of digesting the different alimentary principles.

In an alkaline fluid, all three have the power of transforming starch, and do not digest meat, whilst in an acid fluid they dissolve meat, but do not act upon starch. Thus, it appears easy to transform these fluids into each other, and to make an artificial gastric juice from the pancreatic fluid, and vice versa. The action of saliva, however, is less energetic, whether on meat or starch, than the pancreatic juice.—*Comptes Rendus*. *Lancet*.

**Antagonism of Cachexic.**—In the Foreign Department will be found a brief analysis of an essay lately published by M. Trousseau, (the well known pathologist, and professor of therapeutics in the Faculty of Paris,) to which we wish to draw attention. The views contained in this essay are ingenious, and deserve to be seriously considered; although they are much too speculative to be adopted in the present state of medical knowledge.

M. Trousseau first points out, in an extremely lucid and forcible manner, a fact in general pathology which is generally admitted, although often lost sight of, viz., that anemia, as indicated by the changes that take place in the composition of the blood, is the pre-
dominant symptom of very varied morbid states, each of which requires different treatment. So far every one will agree with the Parisian professor. This, however, cannot be the case when he attempts to establish a kind of antagonism between these varied cachectic states,—when he asserts, for instance, that the cachexia of chlorosis preserves from that of tuberculization, and that by restoring, through the agency of ferruginous preparations, to its normal condition, the blood of a weak, or chlorotic person, in whom there is the slightest predisposition to phthisis, we expose him to immediate manifestation of the latter disease. M. Trousseau, it is true, asserts that this opinion is the result of lengthened experience; but we have a right to question his interpretation of the facts he has seen, when we find it running counter to the experience of the great majority of physicians. That chlorosis does not so often lead to phthisis as might be expected, when we consider that it is a disease of debility, we must admit. The chlorotic cachexia is evidently different from the tubercular cachexia, or we should not see so many young females remain during several years in an anæmic condition, and yet ultimately rally, under proper treatment, without tuberculization taking place. But there is a great difference between admitting that such is the case, and looking upon the chlorotic cachexia, along with M. Trousseau, as absolutely guaranteeing persons against scrofula and phthisis. It is difficult to believe that a disease which breaks up the health, depraves the fluids and the solids of the body, and gradually depresses its vitality, should preserve from another disease, the manifestation of which is generally considered to be induced precisely by those causes that tend to reduce the powers of life. It is equally difficult to believe that a therapeutic agent which is calculated to restore the diseased blood of a chlorotic patient to its normal state, should expose that individual, as M. Trousseau says it does, to the attacks of phthisis, precisely because it vitalizes and animalizes the animal fluids.

M. Trousseau has, we believe, fallen into the very error with which he reproaches M. Rayer, when the latter recommends iron in albuminuria, on account of the anæmic state of the blood. He has allowed himself to be led away by a theory. That theory is, the antagonism of cachexia, which may exist even to the extent supposed by M. Trousseau, but the existence of which has certainly yet to be proved.

The learned professor brings forward, in support of this view, the reputed antagonism of intermittent fever and phthisis. Our readers will remember that we have, at various periods within the last few years, laid before them accounts of the labours of different continental practitioners who assert that there is an evident antagonism between the cachexia of intermittent fever and that of phthisis, and that in marshy districts, where all the population is more or less under the influence of the miasmatic cachexia, scrofula and phthisis are nearly unknown.
The recent researches of French pathologists have rendered it very probable that such really is the case, but they cannot be said to have proved it. M. Trousseau's views respecting the antagonism of chlorosis and phthisis were, most likely, suggested to him by the discussions which have taken place on that subject. He has endeavored to generalize a principle of pathology, which he has accepted as proved, although, in reality, it is yet sub lîte. Such an attempt at generalization cannot but be looked upon with interest, especially when made by a man of M. Trousseau's scientific authority, but it ought not to be adopted without due reflection and proof.

Although we are thus inclined to receive with doubt and suspicion the theory of "the antagonism of cachexia," yet we must confess that its very simplicity renders it attractive, and that it is one of the questions of general pathology which is most deserving of elucidation. Indeed, principally with the view of drawing the attention of British pathologists to the consideration of this asserted pathological law, do we now so pointedly allude to it, wishing to stimulate our readers to inquiry, and taking the present opportunity of mentioning that we shall be happy to give publicity to any researches which may be made in this direction. The marshy districts of Lincolnshire, and of other parts of England in which intermittent fever reigns supreme, must afford as good opportunities of observing the antagonism of miasmatic cachexia and phthisis, as those of France. On the other hand, our large manufacturing towns, in which both chlorosis and phthisis are so extremely prevalent, must present excellent opportunities for observing their connexion one with the other.

The influence of preparations of iron over tuberculization is a question which also deserves to be seriously investigated. The opinion of M. Trousseau is certainly opposed to the opinions and experience of many practitioners, who have been in the habit of administering iron in the incipient stages of tuberculization, with, we think, marked benefit. In works on pathology, experiments are mentioned in which rabbits and other animals fed on moist unwholesome food mixed with iron, and kept in damp, dark localities, did not become tuberculous; whilst others, fed and kept in the same way, but without iron, rapidly fell victims to tuberculization. These experiments might be easily repeated, especially by practitioners living in the country.—London Lancet.

Some hints on the most efficient modes of administering Medicines. By a practitioner of half a century.—Many of the most important discoveries and improvements in medical science are rendered comparatively useless, in consequence of being unskilfully applied to actual practice. In no department of knowledge is this defect more conspicuous than in therapeutics. Man (and I believe the same remark applies to all created beings) is born with a kind of instinctive antipathy to physic. which antipathy he retains from the cradle to the grave. Look at the ingenious spoons that have been invented to
force physic down the throats of infants! Observe the mantle-pieces of sick chambers, and count how many phials are either un corked, or only half emptied! How great a proportion of mankind hate the very name of physic! If the stomach is apt to turn at the thought of medicine, when we are in health, how much less capable is it to bear nauseous drugs in the various forms of disease, nine-tenths of which affect the stomach sympathetically with squeamishness, nausea, and aversion to food as well as physic? The evil consequences of nauseous forms of medicine being used in sickness, are great beyond all calculation or belief. One result is, that medicine is not taken in sufficient quantity, sufficiently often, or for a proper length of time.

What practitioner will fail to recognize the following picture of almost daily occurrence? A medical man is in anxious attendance on a patient—say a lady after confinement, and threatened with some grave malady, peritonitis, for instance—he prescribes what he conceives to be active and efficient remedies for the night, and gives strict injunctions to the nurse. In the morning, when he calls, he meets the nurse on the stairs. Have you given your mistress the medicines punctually? Most punctually, sir. Well, what has been the effect? "Brought everything up again sir." What, all? "Every drop, sir—and I thought she would have brought her very heart up with it." After such intelligence, the feelings of the doctor, on entering the chamber, are not particularly enviable. Now all this is more frequently owing to the form than the substance of the medicine exhibited.

In chronic diseases, where the remedial process is necessarily chronic also, we are daily baffled by the repugnance, nay, the resistance of the patient to a protracted course of physic. Yet it might very generally be so contrived, that the patient would desire rather than loathe his medicines.

I am aware that in some acute diseases, the state of nausea itself is desirable and salutary. But it is not the mere nausea or sickness which lessens the velocity of the circulation, opens the secretory vessels, and checks inflammation. These remedial processes depend much upon the quantity of medicine, say antimony, which the patient can bear in order to induce them. Thus double or triple the quantity of tartrate of antimony will be borne, before sickness is induced, if given in an effervescent draught, as compared with the same medicine given in plain water. And the remedial effects will be in proportion. This is a truth that should ever be held in mind, and the principle was well understood by Rasori, Thomasini, and others. The contra-stimulant effects of antimony are tripping during the nausea and sickness at the beginning. It is when the tolerance is acquired that the inflammation or high fever is controlled.

But there is a large class of diseases in which the stomach is morbidly irritable, and where nauseating medicines are positively injurious. Putting aside the multitudinous forms of dyspepsia, we have
affections of the uterus, the kidney, the liver, the pancreas, &c., where the stomach is prone to disordered function, and where it is of the greatest consequence to exhibit medicines in forms that will tranquil-
ize rather than nauseate the stomach. Diseases and disorders of the
kidney are now acknowledged to be much more frequent than they
were formerly suspected to be—and these are very generally attend-
ed with gastric irritability. In these it is of great importance not
to ruffle the stomach by medicines. In affections of the brain, now
so exceedingly common in consequence of the advanced stage of
civilization, and the operation of various perturbing moral causes, the
stomach is often the organ most conspicuously deranged—and we are
not seldom foiled in the exhibition and perseverance of proper reme-
dies, from the sympathetic disorder of stomach.

Nine-tenths of the cures that are said to be performed by homoeo-
pathy, result from the spare diet and the nullity, as it were, of the
medicine employed. Of all the medicines that are prescribed by the
physician, the class of salines are the most generally beneficial, as
opening the secretory organs, as the skin, the liver, the kidneys, &c.,
besides improving the state of the blood, and restraining febrile ac-
tion in the constitution. These, when exhibited in an effervescing
state, are far more palatable, as well as more efficacious, than when
given in a plain form.

Tonics, on which the routine practitioner so much relies, and
which he exhibits with no sparing hand, are more frequently injuri-
ous than beneficial. They give a feeling of tone for a time; but they
lock up the secretions, increase too much the appetite, and lay the
foundation for future states of plethora, congestion, or indigestion.

Now saline effervescents may be made the vehicle for many of the
most powerful tonics, and indeed the most potent medicines which
we possess. The citrate of iron, colchicum, antimony, arsenic, qui-
nine, iodine, &c., &c., may all be exhibited in a form that increases
their remedial efficacy, and lessens their tendency to nauseate the
stomach.—Bulletin of Medical Science.

Ox-gall in Constipation.—Dr. R. H. Allnat, in a paper in the
Lancet. (June 7th, 1845,) relates several cases, illustrative of the
good effects of insipissated ox-gall in the cure of habitual constipation.
In a subsequent No. of the same Journal, (July 12th,) he recom-
mends that the ox-gall should be prepared in a water-bath, the gall
being frequently stirred, to produce a perfectly homogeneous ex-
tract. The addition of a small quantity of magnesia will, he says, expedite
the process. He gives it in doses of five grains made into pills,
three times daily. He administers it also in some cases, in the form
of enema.—American Journal.

Treatment of Infantile Gastric Fever. By Golding Bird, A. M.,
M. D.—The origin of gastric fever occurring among children is
usually to be ascribed either to unhealthy ingesta or depraved secre-
Sulphate of Quinine.—Vaccination. [December,


tions. The pulv. sodae comp.* of Guy’s Pharmacopoeia, in doses of three to eight grains at night, and a full dose of the pulv. rhei salin.† every morning for a week or so, will in most cases be found very successful treatment. To the latter compound, so well known to the profession for its almost specific power in these affections, Dr. For- dyce accorded this elaborate praise—"Had I been more ambitious of dying a rich man, than of living a useful member of society, the powers of our anti-hectic powder in curing, as if by miracle, the hectic fever and the swelled bellies of children in this town would have remained a secret while I lived."—Guy’s Hospital Reports.—Braithwaite’s Retrospect.

Sulphate of Quinine not absorbed when applied Endermically. By M. Martin-Solon. (Bulletin de Thérapentique, Dec. 1844.)—Many medicines, when applied to the skin either whole or deprived of its cuticle, act energetically on the economy, and may be detected in the secretions, thus showing they have been absorbed. Sulphate of quinine, when given internally in the dose of one grain, may easily be detected in the urine by means of the ordinary tests, as iodide of potassium, &c. Martin-Solon, however, has made many experiments on twenty individuals affected with various maladies, relative to this medicine being absorbed when applied to the skin, and in no case has he succeeded in detecting the slightest traces of the medicine in the urine. The sulphate of quinine was applied by friction to the sound skin, and to that denuded of cuticle, in baths and by means of ointments. The effect was null in all.

Report relative to Vaccination.—The French Academy of Medicine offered a prize of 10,000 francs for the best report upon the following questions, viz:

1st. Is the preservative power of the vaccine permanent, or is it merely temporary? In the latter case, the time during which vaccination will protect from small-pox, is to be determined by precise observation, and well authenticated facts.

2d. Does the cow-pox afford a more certain or permanent preservative effect, than the vaccine which has been employed in a number of successive vaccinations, more or less considerable? Does the intensity of the local phenomena of vaccination, bear any relation to its preservative effects?

3d. In case the preservative property of the vaccine becomes enfeebled by time, must it be renewed, and by what means?

4th. Is it necessary to vaccinate the same person several times,

* Sodae Carbonatis exsiccatæ 5v. Hydrargyri Chloridi 5i. Pulv. Cretæ compositi 5x. m.
† Rhei radicis pulv. 5i. Potassæ Sulphatis 3ij. m.
and if so, after the lapse of how many years, should a new vaccination be made?

The questions were proposed by the Academy for 1842, but in view of the great number (35) of works which were sent to the concours, a decision upon their respective merits was postponed until 1843—Even up to that time the whole of the articles had not been examined, and a further postponement of the report of the commission was decreed.

In April 1845, this commission, consisting of M. M. Magendie, Breschet, Duméril, Roux, and Serres, made a report, which from its length we cannot give entire, we will therefore only extract their conclusions.

1st. The preservative power of the vaccine is permanent in the greater number of vaccinated subjects, and temporary in a small number. Even among the latter, it affords an almost entire protection up to adolescence.

2d. Variola rarely attacks vaccinated persons before the age of ten or twelve years—It is from this period up to the thirty-fifth year that they are principally exposed to its attacks.

3d. Besides its preservative property, the vaccine effects a modification of the organization, which renders variola more mild, and abridges its duration.

4th. The cow-pox gives to the local phenomena of vaccination a marked intensity, and its effects are more certain than when old vaccine matter has been employed—But after some years of transmission through the human subject, this local intensity disappears.

5th. The preservative property of the vaccine does not appear to be dependent upon the intensity of the local symptoms; nevertheless to preserve its properties, it is prudent to renew the vaccine as often as practicable.

6th. Among the means proposed for its renewal, the only one in which confidence can be reposed, consists in procuring the matter from its original source.

7th. Re-vaccination is the only mode by which we can distinguish those vaccinated subjects who are fully protected from variola, from those who are only partially so.

8th. The proof afforded by re-vaccination, does not furnish certain evidence, that the vaccinated persons in whom it succeeds, would have contracted variola; but it merely offers a probability that such would be the case, as it is only among such subjects, that the disease is developed.
9th. In ordinary times re-vaccination should be practised about the fourteenth year; during an epidemic, it is prudent to renew it at an earlier age.—*Jour. des Connaissances Méd. and Chir.*

**MEDICAL INTELLIGENCE.**

*Medical College of Georgia.*—The annual course of Lectures in this Institution, began on Monday the 10th November. The Introductory Lecture was delivered by Prof. Ford, to a large audience of students and citizens. The class now in attendance, both in numbers and general intelligence, is not surpassed by any which has preceded it.

**METEOROLOGICAL OBSERVATIONS, for October, 1845, at Augusta, Ga.**
Latitude 33° 27' north—Longitude 4° 32' west Wash. Altitude above tide 152 feet.

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18 Fair days. Quantity of Rain, 7 inches.