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ON THE DIARRHŒA OF INFANTS.

By G. R. GRASETT, M. D., Toronto.

(Proceedings of the Toronto Medico-Chirurgical Society.)

It is unnecessary that I should offer any definition of the term "*Diarrhœa*," a disease which I suppose to be coeval with the history of our first parents; nor do I propose to dwell at any length on its numerous varieties, which are distinctly described in all the standard authorities in medicine of the present day. The feculent, the bilious, the mucous, the serous, the chylous, and other species of Diarrhœa, are respectively attributed to different agencies, and each of them seems to demand a different mode of treatment. I shall confine myself, on the present occasion, to that *general* form arising principally from the irritation produced by dentition, and into which one or other of the varieties I have just mentioned is found most commonly to enter. For the sake of perspicuity I shall notice it:—

1st. In its history, general and pathological.

2nd. In the treatment which, so far as my observation has extended, it is desirable to pursue.

The amount of deaths, from this and from other diseases, occurring at the period of dentition, is greater than I feel warranted in stating in precise terms. Dr. Arbuthnot estimated it to be one in every ten, and other authors one in every six. Whether these computations have been founded on correct data or otherwise, I do not venture to say, but admitting that they have exceeded the reality, we cannot close our eyes to the truth, which stands out in bold relief, that the mortality, at this critical period, is exceedingly great.

I am disposed to consider this malady as being possessed of a two-fold nature, although in giving expression to this opinion I may be exposed, perhaps, in some degree, to the charge of admitting a paradox. But if I should say it is *Idiopathic*, it would involve a conclusion manifestly erroneous,—if it is pronounced *Symptomatic*, it would not comprehend all the circumstances converging to its production. I deem it, therefore, to be constituted of *both*, and believe it to arise *idiopathically* from the action of a hot sun on the hepatic system, and *symptomatically* from the irritation of dentition. I am supported in this opinion by the fact, that *infants under the age of six months are much less subject to Diarrhœa*, notwithstanding the influence adverted to, and that when it *does* occur, it assumes, in most instances, a form which is very readily under the control of treatment. Again, in the absence of this influence, the act of teething, considered simply in itself, is not so frequently productive of the disease under consideration, a proof of which is exhibited in the *cessation of the symptoms on the approach of cold weather, although the process of dentition continues to go forward with undimished activity.* These circumstances have led me to the obvious and irresistible conclusion, that a primary cause, as well as one arising from sympathy, *generally* concurs to establish (at least in our Canadian climate) the obstinate Diarrhœa with which this feeble class of patients have so often to contend.

It must have been observed that, under ordinary circumstances, it makes its approach with insidious steps: the dejections are rather more frequent than they ought to be, but as they present a natural appearance, it excites but little attention, and it is permitted, perhaps, to coninue for some days, and gradually to increase before medical aid is solicited. Even now that aid would not be sought were it not for the more prominent co-existing circumstances of irritability of the stomach, and constant restfulness of temper. The absence of pain on pressure, of pyrexia, and of morbid redness of the tongue, give satisfactory evidence, that in this stage of the disease it cannot be regarded as of a truly inflammatory character. There is merely a degree of irritability in the mucous membrane, occasioned by an increased secretion of bile, evidenced by the bright green evacuations. But this irritability, from the continued operation of the same causes, in process of time, produces alteration in the pathological condition of the lining membrane, and some degree of inflammatory action ensues.

It is very difficult, in the *early* stages of Diarrhœa, to ascertain the precise nature of the morbid appearances. I must own that I have never had the opportunity of being present at such an examination, and I believe that the opportunities must be rare. Dr. Crampton observes, that "the membrane, in recent cases, has been observed more or less red and congested, or extremely pale and anæmic; the redness being disposed in patches or in continuous stripes, leaving the intervening portions very

pale." With due deference to so high an authority, I may affirm, that in almost numberless instances, I have witnessed these very appearances in the alimentary tube, when it was deemed, by more competent judges than myself, to be perfectly healthy. I am willing, however, to allow, that an acrid secretion of bile, *continuing* to flow over a tender membrane, exhibiting the disposition to put on inflammatory action, may lead to more well-marked changes in its normal structure; and when these take place, the evacuations alter their character, being serous with slimy or ropy matter, occasionally containing coagulable lymph, tinged with blood, and generally speaking of a highly fœtid description.

The mesenteric glands now become, in many instances, inflamed, enlarged, and indurated, from the absorption of the acrid alimentary matter, very analogous to that which occurs in inguinal bubo. Fever takes place, with thirst, restlessness, and interrupted sleep. Rapid emaciation follows, and the scene is frequently closed with repeated convulsive attacks.

We may probably agree in thinking, that in the middle and latter stages, the term Diarrhœa is no longer applicable to this disease, for all the different features of dysentery are essentially assumed, and the appearances observed on dissection are precisely those presented in cases of dysentery. If it be inquired what these appearances are, a more satisfactory reply can be given than that which refers to an earlier period of the disease; although it must be admitted that they differ in most cases, sometimes being limited to the intestines themselves, and at others, involving, *with these*, the omentum, the mesentery, and its glandular appendages. I believe I am correct in stating that the chief traces of disease are to be found in the intestines themselves, which are sometimes agglutinated together—at other times contracted in their calibre, and not unfrequently intus-susceptions are met with. The mucous coat is much thickened, inflamed, and even ulcerated; the ulcers varying in shape and size, and occupying sometimes the large and sometimes the small intestines. It is also occasionally œdematous, and flakes of coagulable lymph are found adherent here and there to inflamed or congested portions of its surface. Whatever may be the nature of other concomitant structural changes, it is evident, as I before observed, that the primary and chief seat of the disease is found in one part or other of the mucous membrane of the intestines, and this fact must be deemed satisfactory, in the position it holds, with regard to a definite plan of treatment.

I have but one more circumstance to notice as occurring in connection with this disease, and of which no mention is made by any of those authors with whose writings I have so far become familiar. I refer to the influence which the very great disproportion of the cerebral mass to the rest of the body in infants must exercise in giving origin to gastro-intestinal affections.

I now come to speak, in the second place, of the treatment which this formidable affection seems to require. If I am correct in my views as to its causes, and its pathological history, the indications to be fulfilled will be sufficiently apparent. I need not point out the separate treatment which a mucous, a bilious, or a chylous tendency in its early stage would clearly indicate, but I would briefly dwell upon that course which, in its established form, it appears advisable to pursue. In those instances, where a change of climate is practicable, such a change cannot but be regarded as promising much that is valuable in this disease. In addition to the irritation of teething, the continued heat of the summer in the western portion of this Province operates in a degree that can scarcely be too highly appreciated, in the production, in the first place, and in the subsequent augmentation of the Diarrhœa of infants. Where, then, there is no combination of obstacles to a removal, the climate of Quebec offers a decided advantage, simply because its temperature is modified by those frequently recurring easterly breezes which are sent up the St. Lawrence as through a huge funnel; and from my observation during a long residence in that city, I can bear, without fear of controversy, this favorable testimony to its character. The climate of Kamouraska, situated farther down, and having a near proximity to the sea coast, would, perhaps, hold out still higher advantages to the infant invalid, although, on this point, I do not speak from personal knowledge. But of this I am quite persuaded, that the cases of recovery would exhibit a much larger proportion, could my professional brethren be induced to urge an exchange of the now favorite locality of Niagara for the more distant points to which I have just adverted.

In many instances the inflammation or morbid action of the mucous membrane extends, or perhaps is transferred to the serous coat, giving rise at one time to ascites, and at another to general anasarca. The plan of treatment which I have found of most service is best shown in the detail of an interesting case of this nature which occurred to me during the past summer.

Mrs. B——'s infant had suffered for many weeks from Diarrhœa. The parents stated that they had lost a child a year or two previously under precisely the same circumstances, and so persuaded were they that all means would now prove unavailing—that they *fully expressed this belief* on confiding the infant to my charge.

Several teeth were forcing their way through the

gums—the evacuations were very numerous in the course of the twenty-four hours—there was ascites, and the lower extremities were œdematous. Daily fever, a frequent cough, emaciation, and loss of sleep, comprised the remaining formidable symptoms. An emetic was first exhibited, the gums repeatedly scarified, and the following directions strictly carried out:—A salt water bath for a few minutes each night, employing during the time continued friction over the abdomen,—repeated frictions, with dry mustard to the legs and feet by means of a piece of new flannel, through the day, with bandages round the whole of the abdomen and inferior extremities, and a powder exhibited every four hours, composed of two grains of the hydrargyrum cum cretâ, $\frac{1}{4}$th of a grain of ipecacuan, and the same quantity of the pulv. scillæ. These means were steadily persevered with, and in less than a fortnight I had the gratification of observing a material improvement. The anasarca had entirely disappeared—the diarrhœa much diminished, and the strength proportionably increased; and no lengthened period elapsed before the health of the infant was perfectly re-established.

But it will be said that this system is applicable to a *proportion* only of the numerous cases which fall under our daily observation during the summer and autumnal seasons. I yield to the force of this observation; but having contested with *one* class of cases with at least a measure of success, I am sanguine enough to hope that we may, with equal confidence, prepare to meet the advance of another. Where, then, the disease in its wasting form has long maintained a struggle with the enfeebled constitution, and the consequences of a debilitated and relaxed state of the mucous membrane continue, I beg earnestly, yet with much deference, to suggest *another plan*, which, although adopted in Europe within the last few years, has not, I have reason to believe, experienced a fair trial in this country. A notice in a foreign journal first suggested the idea to me; and in a case which I attended, in conjunction with our distinguished President, sufficient effect was produced to encourage a repetition in instances of a similar nature. I refer to that remedy so invaluable in its application to a catalogue of *other* affections, the crystallized nitrate of silver. I do not stay to speak of its strongly astringent properties, nor is it necessary that I should expend words in discussing its eminently tonic powers; but I would, in most emphatic terms, urge my confreres to afford it admission on their list of remedial agents in the diarrhœa of infants, and with candour to test its value for themselves. Its employment, both by the mouth and through the instrumentality of the lavement apparatus, is equally beneficial and safe, and its usefulness can scarcely be questioned, whether the disease exists as yet in the simple form of irritation, in established inflammation, or in actual ulceration of the villous lining of the alimentary canal. Presented thus as a topical application to a congested or inflamed surface, it must obliterate more or less the injected vessels, as it would obliterate those which are observed on *any external* surface; and, combined with opiates, it cannot fail to prove highly serviceable in altering the character of the ulcerated tissue, and disposing it, (if *anything* will dispose it,) to assume a healthy action.

CASE OF RE-UNION OF THE HUMERUS AFTER FIVE MONTHS FRACTURE.

By William Marsden, M.D., Nicolet.

Feby. 20, 1844.—Was called to Hannah Colbert, ætatis 33, wife of Patrick Keif; a strong and muscular woman, who had been injured by the fall of a very large hemlock tree. She had been brought to bed of her seventh child on the 6th of the month, only a fortnight previous to the accident, and was nursing at the time. Found simple comminuted fracture of the humerus, and simple fracture of the femur and three costæ of the left side, with considerable *ecchymosis* of these latter parts. The tree, in its descent, first struck the humerus, the arm being elevated; and finally rested upon the thigh, pinning her to the ground. A portion of the tree about 12 inches in diameter had to be chopped off before she could be removed. I had her immediately removed to a comfortable lodging in the village, and, with the assistance of my students, the fractures carefully set, &c. Mrs. Chandler, the kind hostess of the manor house, ever foremost in the cause of charity, caused the infant, by my directions, to be taken from the mother and placed at nurse. The superior fracture of the humerus was immediately below the insertion of the deltoid muscle, and the inferior one about three inches above the bend of the elbow. The fractures of the thigh and ribs progressed admirably and naturally. The constitutional derangement was comparatively slight—the milk producing no inconvenience. On the 12th of March the woman, in whose charge she was placed, apprized me that my patient was in the habit of untying the bandages and scratching the shoulder. I therefore gave strict orders not to repeat the practice, and represented to her the danger and folly of it; and secured the bandages so as to make a sufficient degree of longitudinal pressure. On the 24th March, examined the humerus, and found the *inferior* fracture *re-united*, but in the superior one no attempt at re-union whatever. On raising the arm the upper portion of bone rose up almost at right angles with the lower one. On inquiry I learned (after much quibbling and pre-

varication,) that she had again removed the bandages, "only two or three times, just to see how it was getting on." The fear of displacing the lower fracture prevented my doing more than re-apply the splints and bandages, until Friday the 3rd April, when I rubbed the fractured ends of the bones freely together, making longitudinal pressure, and allowed it to remain in that state until the latter end of April, when, finding re-union had not taken place, I wrote the history of the case to a medical gentleman in Quebec, Dr. James Douglas, of whose surgical skill and knowledge I entertain a high opinion. I subjoin a portion of his letter (although it was not written with a view to publication) as being interesting not only from its bearing upon my case, but in itself also.

Soon after its receipt I had resolved to operate as suggested, and had obtained the consent of the patient and her friends. On the 20th of May Dr. Bruneau, of Montreal, having been called in consultation by the friends of a patient of mine, I availed myself of his visit, to shew him the case. He suggested rubbing the fractured ends of the bones again, applying starched bandages and making longitudinal pressure, as the only means of preventing the removal of the splints. Various circumstances, having no bearing on the case, prevented my doing anything more until Saturday the 15th of June, when I resolved, as a *dernier resort*, to give Dr. B.'s suggestion a fair trial before operating. I accordingly applied pasteboard with starched bandages, having first rubbed the ends of the bone freely together (in fact until the patient complained of pain and soreness) and made *strong* longitudinal pressure. So slight, however, was my hope of success, that I had written to my friends, Dr. Von Iffland, of Yamaska, and Dr. Gilmour, of Three Rivers, a few days after, announcing my intention of operating on the 22nd of July, and asking their assistance at the time, if disengaged. Ten or twelve days elapsed after the last application when she stated, that "the arm was very itchy, and that if she could have removed the bandages *without my knowledge* she surely would have done so, to give it a good scratching." She also said "she was sure the bone was knitting, as she often felt shooting pains in the bones, &c., to all which I gave no heed, except to urge her not to disturb it, as being her only chance of avoiding an operation, which, indeed, I thought inevitable. On Saturday the 20th July, being two days previous to the day on which I proposed to operate, I proceeded to remove the bandages and splint, or pasteboard, and you will more readily imagine, than I express, my surprise, and the poor woman's delight, on finding that *re-union was perfect and complete*, if we except a very slight curvature depending either on the degree of longitudinal pressure applied, which was considerable; or on the action of the muscles, or both, as she admitted having attempted to raise the arm *sometimes*.

EXTRACT OF LETTER.

Quebec, May 3, 1844.

"It is odd that the humerus is the bone in which, when broken, non-union is most frequently observed. I think the want of union does not depend alone on constitutional causes; if it did, union would not have taken place in the ribs or thigh of your patient. I had a case last year of fractured ribs and humerus in a strong and powerful man of good habits and middle age (35). The ribs united in due course of time, but there was no attempt at union of the humerus. Pressure was made longitudinally, and the ends of the bones were forced together, but without avail. I tried to produce the necessary action by rubbing the fractured ends together, but equally without avail. Five or six months after the receipt of the injury, I cut down to, and removed the ends of the bones, which succeeded perfectly. The arm is now as strong as ever, and the individual earns a livelihood as a labourer. In Mrs. ——'s case, pressure, and rubbing, and setons inserted between the fractured ends, were used, but without success, and I believe they are generally unsuccessful. From the appearance of the ends of the bone in last year's case, I am satisfied that nothing but the removal would have done good. The operation offers the best chance, and is the least painful; when cut down to, the ends of the bone may be removed by a strong pair of bone forceps."

Signed, "J. DOUGLAS."

My own opinion now coincides with that of Dr. Douglas—that non-union did not depend on constitutional causes in my case; nor did it depend on parturition. Non-union is sometimes attributed to the continued use of cold applications, &c., but I am convinced that in my case it depended solely on the stubborn and repeated displacement of the ends of the bone by the patient herself.

EXTRA UTERINE PREGNANCY.

REMOVAL OF THE CHILD BY THE CÆSAREAN OPERATION.

By M. M'CULLOCH, M. D., Lecturer on Midwifery, M'Gill College, Montreal.

Madame Reaume, aged 21, a native of St. Eustache, in this District, had, on a former occasion, a living child at the full term, and when she first consulted me, in May, 1828, was again pregnant, and had passed about fifteen months from the last catamenial period and about ten months from the time of quickening, without having experienced any symptom of parturition, although the abdomenal enlargement and other symptoms left no doubt of the existence of pregnancy. During the first nine months of that period, she frequently experienced severe pains in the right iliac region; but after the completion of the usual term of utero-gestation the motion of the child was no longer felt, and she thought her sufferings, in consequence, became much less severe. About the same time the milk began to flow from her breasts, and a lochial discharge appeared, and continued several days. Notwithstanding this remarkable change the abdomen did

not decrease, and the fluctuation only of an immense quantity of fluid could be detected.

She remained nearly in the same condition until the following month of November, when I endeavoured, by tapping the abdomen, to alleviate her sufferings, and about thirty-six pints of liquid, of the color and consistence of pale ink, were drawn off. The child could now, for the first time, be distinctly felt, under the integuments, and the position of its body and limbs easily traced. She experienced no inconvenience or bad consequences from the operation, although she had very imprudently ventured to walk a few hundred yards to the village Church on the following day. Diuretics, and occasionally a purgative, were for some time administered, and I had the satisfaction to find that she afterwards remained free from the slightest symptom of dropsy. She, nevertheless, continued to suffer daily from fever and debility until the month of June following, when putrid matter, mixed with quantities of hair from the child's head, began to ooze from her navel. The skin was inflamed a few inches round an opening that would admit the point of the finger, and nature was, in this way, evidently making a most interesting effort to expel the child, and save the life of the mother; but she had become so feeble and emaciated as scarcely to leave a chance of her surviving a few days, and I thought I was, under the circumstances, warranted in proposing the Cæsarean operation as her only hope. At the same time, her alarm was much increased by observing two worms escaping from the navel, and she, without hesitation, agreed to submit to whatever I thought would afford her a chance of recovery. Being then six miles distant from the nearest professional friend, I did not, under the circumstances, consider myself warranted in waiting for assistance, I therefore had her at once placed on a table, and made an incision in the linea alba extending five or six inches downwards from the navel, and in the third year of her pregnancy, removed a putrid child of the ordinary size at birth. She did not lose an ounce of blood, and bore the operation with great courage. No vestige of a placenta remained, and the child was found in a sac that had formed adhesions all round to the walls of the abdomen, and appeared to be the fallopian tube enormously distended and thickened. It contained, besides the child, a quantity of very offensive matter. Nearly all the bones of the toes and fingers were found detached, and some of them adhering to the sides of the cavity were carefully removed; a small tent was then placed at the bottom of the incision to favor the escape of matter, and its edges were kept in contact with adhesive plaster, supported with a bandage. She afterwards continued to improve daily, although the thermometer, at the time of the operation and for several days after, was upwards of 90° in the shade. Her progress, notwithstanding, from a state of extreme prostration to perfect health was so rapid, that she was able, without inconvenience, to be taken six miles to Church a month after the operation.

She has since enjoyed excellent health, and, without regret, remains childless.

Montreal, October 1, 1845.

EXPERIMENTS ON A FEW OF THE MINERAL WATERS OF CANADA.

By A. Hall, M.D., Lecturer on Chemistry, M'Gill College.

MINERAL SPRING AT VARENNES.

On the southern shore of the St. Lawrence, about 15 miles from this city, easily reached by a steamer which plies regularly between the two places, the above village lies most picturesquely situated. About a mile to the north of the village, and about 600 or 800 yards from the shore, which is here barren and stony, and exhibits numerous boulders, the springs bubble forth, of which two have been recognised; one of them, not yet examined, is said to be highly charged with light carburetted hydrogen gas. The water which I obtained comes from the Saline Spring, and was sent to me for examination in carefully sealed bottles, in the Autumn of 1842, but was not submitted to investigation until the Spring of 1843, in consequence of severe occupation during the winter months, which precluded every thing of the kind. I can hardly doubt but that its gaseous constituents must, to a certain extent, have escaped, but that they had not done so to any great amount, is, I think, sufficiently demonstrated by the fact, that no precipitation of carbonate had taken place in the bottles, which would certainly have occurred, had the carbonic acid, which confers solubility on the carbonate of lime, of which this water contains a great deal, been materially diminished in the quantity held in solution.

I. *Qualitative Analysis.*

1. The specific gravity of the water was found to be 1.0091.

2. No effect was produced on blue litmus paper.

3. Red litmus paper was turned blue, and turmeric paper brown, thus indicating the presence of an alkaline or earthy carbonate.

4. Barytic water produced a copious white precipitate, soluble in nitric acid,—indicative of carbonic acid.

5. By boiling, a precipitate ensued soluble with effervescence in hydro-chloric acid,—indicative of the presence of an earthy carbonate.

6. After boiling and filtration, the addition of oxalate of ammonia induced a further precipitate, giving

a clue to the presence of lime, in combination with a stronger acid than the carbonic.

7. After boiling and filtration, lime water throws down a precipitate, soluble in hydro-chlorate of ammonia; and phosphate of soda, and carbonate of ammonia, with boiling, induces likewise a white precipitate—magnesia.

8. Nitrate of silver throws down a heavy curdy precipitate, indicating chlorine.

9. Starch, sulphuric acid, and chlorine water, added to the cooled liquid after boiling, in the usual manner, was attended, after a short time, with the production of a purple streak at the line of junction of the liquid and supernatant chlorine water, thus affording evidence of the presence of iodine.

10. Cautious evaporation to dryness was attended with a distinct crystallization, the crystals assuming the cubic form, bearing every resemblance to common salt.

11. Carbazotic acid, added to a concentrated solution, was not attended with the formation of any precipitate, thus proving the absence of potassa.

12. To determine whether any magnesia existed in the precipitate obtained by simply boiling the water, the following experiments were adopted :—Eight ounces were boiled, and the precipitate carefully collected on a filter, and washed. It was now dissolved in hydro-chloric acid. To one portion was added oxalate of ammonia, to precipitate the whole of the lime, and it was now re-filtered. To the filtered solution a sufficiency of ammonia was added, to neutralize any free hydro-chloric acid, and caustic potassa was then added, and the whole boiled, but no precipitate appeared. To another portion, phosphate of soda, and carbonate of ammonia were added, after the precipitation of the whole of the lime by oxalate of ammonia. This also was submitted to ebullition, but no precipitate took place,—thus indicating by these two experiments an absence of magnesia, and permitting us to infer that the precipitate obtained by boiling the liquid was simply carbonate of lime.

The inference is thus deduced, that the water holds in solution the following substances :—

Carbonate of Lime,	Chlorine,
Carbonic Acid,	Iodine,
Lime,	Sodium.
Magnesia.	

II. *Quantitative Analysis.*

1. An eight ounce phial was obtained, accurately balanced, and into it was poured 1,000 grains of the water. Having been placed in a sand bath, it was allowed cautiously to evaporate to dryness, and the phial was kept exposed to the same temperature as that at which the evaporation was conducted, for at least an hour, until in fact it was sensibly dry. On being weighed a second time, it was found to have increased in weight by 9.40 grains, which is therefore the weight of dried solid material in 1,000 grains of the water.

2. 1,000 grains were boiled, and the carbonate of lime, which precipitated, was collected on a weighed filter, and dried. It weighed 0.300 grs., and consisted of 0.168 lime, and 0.132 carbonic acid.

3. 1,000 grains were precipitated by barytic water. The precipitate was carbonate of barytes and carbonate of lime; it was collected on a filter, washed, and dried: and was found to weigh 4.15 grs., of which the proportion of the carbonic acid to the lime was 0.132, and to the barytes, 0.859, yielding in toto 0.991 grs. of carbonic acid.

4. After boiling, 4,000 grains were precipitated by oxalate of ammonia. The precipitate collected on a weighed filter, washed and dried, weighed 2.65 grains, furnishing for every 1,000 grains of the water, the proportion of 0.662 grains of oxalate of lime, equivalent to 0.061 calcium.

5. 3,000 grains were freed from lime by oxalate of ammonia, and treated with phosphoric acid and carbonate of ammonia, and boiled. The ammonia-phosphate obtained, weighed, after careful drying and exposure to a gentle heat, 5.14 grs. or 0.685 of magnesium, for the 3,000 grains of water experimented on, or 0.228 magnesium per 1,000 grs., giving 0.371 magnesia.

6. 4,000 grains were precipitated by nitrate of silver. It was chloride and iodide of silver, and weighed conjointly, after a cautious fusion, 88.12 grains. It was now placed in a tube, and after having been heated, a current of chlorine gas was steadily passed over it. On being weighed a second time, it was found to have lost 0.08 grs., equivalent to 0.027 of iodine, per 1,000 grains of the water. The residue yielded a proportion of 5.439 grains of chlorine, to every 1,000 grains of the water.

7. 1,000 grains were freed from lime and magnesia, and cautiously evaporated to dryness; the saline residue weighed 7.79 grains, furnishing us a proportion of 3.091 of sodium.

The above investigation furnishes, as the proportion of the solid and gaseous constituents of 1,000 grains of the water, the following summary :—

	Grains.
Carbonic Acid combined,	0.132
Calcium, in combination probably with Chlorine,	0.061
Lime,	0.168
Chlorine,	5.439
Magnesia,	0.371
Sodium,	3.091
Iodine,	0.027
	9.289
Carbonic Acid in gaseous state,	0.859

These were probably combined in the following manner :—

			Grains.
Chloride of Sodium,	Chlorine, ...	4.639	7.790
	Sodium, ...	3.091	
Chloride of Magnesium,	Chlorine, ...	0.635	0.863
	Magnesium, ...	0.228	
Chloride of Calcium,	Chlorine, ...	0.105	0.166
	Calcium, ...	0.061	
Carbonate of Lime,	Carbonic Acid,	0.132	0.300
	Lime, ...	0.168	
Iodide of Sodium, ...			0.031
			9.150

Free Carbonic Acid in 1,000 grains of the water 0.180 cubic inch.

The contents in an imperial gallon of 277.274 cubic inches, will be as follows :—

	Grains.
Chloride of Sodium, ...	545.30
Chloride of Magnesium, ...	60.41
Chloride of Calcium, ...	11.62
Carbonate of Lime, ...	21.00
Iodide of Sodium, ...	2.17
	640.50

Free Carbonic Acid, 12.60 cubic inches.

The Gas Spring will receive a careful analysis at the hands of Mr. de Rottermund, the chemical assistant to the Provincial Geological Survey, who is at the present moment deeply engaged in researches in this department of science.

GEORGIAN SPRING.

Early in the Summer of 1841, I received from Capt. Kains, the proprietor, a quantity of mineral water from a spring to which he had given the above appellation. These Springs are situated in the neighbourhood of Lake George, a lake of unimportant size, though of beautiful scenery, in the township of Plantagenet, on the south side of the Ottawa River, about fifteen miles from L'Orignal, and two miles from Grenville. They are to be met with on the southern margin of the lake, which is connected with the Ottawa by a small stream, called George's River, affording a communication by steamboat. The rock in the immediate neighbourhood of the Springs is *said* to be composed of freestone; slate, containing pyrites, abounds. Limestone makes its appearance about one mile and a half from the Springs, where it forms a high ridge. Not the slightest trace of iron has been detected in the water by myself or Mr. de Rottermund, who strongly suspected its presence, from the appearances which the spring presented on its confines, owing to the oxidation of the iron tube through which the water is made to flow. A detail of the experiments instituted on this spring water by myself was published in the "Transactions of the Literary and Historical Society of Quebec," in 1842. Iodine and silica were both observed in it, but in very minute quantities. The water required to be evaporated to 1-15th its volume, before satisfactory traces of the former could be determined. Various experiments established its specific gravity to be 1.007.

The contents of an imperial gallon were found to be as follows :—

	Grains.
Chloride of Sodium, ...	504.007
Chloride of Magnesium, ...	129.361
Chloride of Calcium, ...	18.830
Sulphate of Lime, ...	35.700
Bi-carbonate of Lime, ...	15.120
Iodide of Sodium, Silica, traces of each.	
	703.018

In several respects this spring water presents some resemblance to the Airthrey Mineral Spring, near Stirling, in Scotland.

(To be Continued.)

Observations made at the Magnetical and Meteorological Observatory at Toronto, in Canada. Printed by order of Her Majesty's Government, under the superintendence of Lieut.-Colonel Edward Sabine, of the Royal Artillery. Vol. I.—1840, 1841, 1842. London: Longman & Co., 1845.

This work, comprising a large quarto volume of nearly 500 pages, mostly composed of intricate tables of figures, and accompanied by numerous plates of comparative observations, has, as its title indicates, been recently published by order of Her Majesty's Government, for circulation among the scientific bodies and institutions of the civilized world.

This very valuable and elaborate contribution to the magnetic and meteorological information now possessed by our *savans*, owes its origin to the commendable zeal and energy which the British Government has so repeatedly manifested in the advancement of science in all its branches, and the anxiety it has always displayed in making known to the world, the results of all the investigations which it has undertaken with that view.

A correct knowledge of the elementary facts of terrestrial magnetism, so as to supply a foundation on which the advancement of that science might be correctly based on inductive principles, has long been extensively felt. The geographical determination of the direction and intensity of the magnetic forces at different points of the world, had been regarded with attention, and engaged the especial research of Humboldt and other eminent continental philosophers, when engaged in voyages or travels; and in Britain, since the peace, such pursuits have occupied the attention of officers of both branches of the service. The British Government, through its recent maritime expeditions, and numerous magnetic surveys in various parts of the earth, has also largely increased the means of arriving at some of the necessary conclusions. But these isolated and unconnected observations, however valuable, afford but a part of the determinations required to found a magnetic theory; other means of

a more permanent and comparative character are necessary, before a system founded on general laws can be framed. For the purpose of obtaining the absolute value of the magnetic elements, fixed magnetic Observatories, under the control of attentive observers, become indispensable, and through them the nature of all magnetic disturbances, and the causes of those perturbations of the magnetic elements which occasionally occur, may, by means of simultaneous and systematic observations, both as to time and as to instruments, be possibly discovered. On the continent of Europe, establishments for the accomplishment of these objects have been formed; but in Britain individual zeal alone was engaged in the inquiry, until 1836, when the attention of her philosophers was more specifically drawn to the subject, by a letter from Baron Humboldt to the late Duke of Sussex—an appeal which was met with every respect and consideration.

In 1837, the University of Dublin, at the instance of Dr. Lloyd, established an Observatory for all researches connected with terrestrial magnetism and meteorology; the same year the Government allotted a site for a similar establishment at Greenwich, to be placed under the control of the Astronomer Royal, and shortly afterwards a third was established at Kelso, in Scotland, at the private expense of Sir Thomas M. Brisbane, Bart.

The British Association for the Advancement of Science commenced in 1834 a magnetic survey of the British Islands, which was completed on its own responsibility in the two following years. The result was published in its annual report of 1838, and the work was followed up in other countries at the expense of their respective governments. In 1838, on consideration of a report made of the progress of the researches regarding the geographical distribution of the magnetic forces on the surface of the globe, the British Association called upon the Government to aid the prosecution of the inquiry in more remote parts of the earth, and, in consequence, a naval expedition was equipped in 1839, for a magnetic survey of the higher latitudes of the southern hemisphere. The Association, at the same time, recommended that similar magnetic, and also meteorological researches, should be accomplished by fixed Observatories at certain stations of prominent magnetic interest within the limits of the Colonies,—Canada and Van Dieman's Land, as approximate to the points of the greatest intensity of the magnetic forces in their respective hemispheres—St. Helena, as approximate to the point of least intensity on the globe, and the Cape of Good Hope, as a station where the secular changes of the magnetic elements were peculiarly interesting, were named; and it was suggested that the Observatories should be placed under the superintendence of the Board of Ordnance, and its military corps. This recommendation, having been strengthened by the support of the Royal Society, was acceded to by the Government; and under the direction of a Committee of the Royal Society, the necessary instruments were prepared, and a code of instructions relating to their use and objects drawn up, published, and subsequently modified. The Antarctic expedition was entrusted with the charge of the Observatory at Van Dieman's Land during its first two years' operations, and the other three were each placed under the management of a lieutenant of artillery, with whom was united three (afterwards four) non-commissioned officers, and two gunners, to all of whom increased allowances were made. The sum of £100 for each Observatory was allotted for incidental expenses, making the total charge for each about £392 per annum.

The officers appointed to the charge of the Observatories were ordered to Dublin, to receive instructions in the manipulation of the instruments in the Observatory there, which were similar to those ordered for the Colonies; and in autumn, 1839, they quitted England for their respective destinations. The officer appointed to Canada was Lieutenant C. J. B. Riddell, who, being obliged to return to England in February, 1841, in consequence of ill-health, was temporarily succeeded by Lieutenant Younghusband, who acted until the arrival of Lieutenant Lefroy in September, 1842. The latter officer proceeded in April, 1843, on a magnetic survey within the Hudson's Bay territories, and was succeeded, *de novo*, by Lieutenant Younghusband, who continued in charge to nearly the end of 1844.

The observations made at the Colonial Observatories having, according to instructions, been forwarded in monthly reports to the Ordnance, were, at the request of the Royal Society, ordered by the Treasury to be reduced and published, under the superintendence of Lieut.-Colonel Sabine, assisted by Lieutenant Riddell, and four military clerks, who were non-commissioned officers of the Royal Artillery.

The results which have already been laid before the public, consequent on these arrangements, have been the publication—Firstly, of the magnetic observations made by the Antarctic expedition on its passage to Kerguelen Island, and during the first and second years of its operations at sea, within the Antarctic circle, and printed at the expense of the Royal Society, in the Philosophical Transactions respectively for 1842, '43, and '44; 2dly, Of observations made in 1840 and '41, at the Observatories, and by the expedition, on days of unusual magnetic disturbance, for comparison with each other, and with similar observations made simultaneously in different parts of the globe, printed by the Government in 1843;

and 3dly, A very useful work by Lieutenant Riddell, containing magnetic instructions for the use of portable magnetic instruments, and for fixed magnetic Observatories, printed by the Government in 1844.

Lieutenant Riddell, on his arrival in Canada, examined different localities which were suggested to him as convenient sites for his Observatory. The preference was finally given to Toronto, where he was offered two-and-a-half acres of ground belonging to King's College, on the sole condition that the buildings erected should be appropriated only for an Observatory, and revert to the College when discontinued. This offer was accepted, and the new buildings occupied in September, 1840. In the mean time a temporary Observatory was formed in a small unoccupied barrack in the city. The new Observatory is situated in lat. 43°, 49″ 35‴, and long. 79°, 21″ 30‴, on a rising ground, about half a mile north of the city, 300 yards west of the University, and 107¾ feet above the surface of Lake Ontario, or 341¾ feet above the sea. The buildings consist—1st, Of an Observatory, having two apartments, one for the instruments, 50 feet by 20,—the other, an office or computing room, 18 feet by 12, with a vestibule or hall, 12 by 6—the transit theodolite occupying a small circular room, connected by a covered passage with the instrument room, and placed at a sufficient distance from it to obtain a view of the lower culmination of some of the circumpolar stars; 2d, A detached building, with a room 18 feet by 12, partly sunk under ground, with a view to uniform temperature, for experimental determinations and observations of absolute intensity. It is situated about 80 feet from the Observatory, so that the instruments placed in it, may neither affect, nor be affected, by the magnets in the Observatory; 3d, An anemometer house, constructed so as to support the vane and pressure plate of Oster's anemometer, at a height exceeding 30 feet above the roof of the Observatory, and above the neighbouring trees; 4th, A small shed for the inclination circle—and 5th, Barracks for the officers and detachment. The whole of the ground granted by the College is enclosed by a picketing. The buildings 1 to 4 are at the eastern end, within an inner inclosure; the barracks for the officer and party are at the western end. The Observatory is built of 12-inch logs, rough cast on the outside, and plastered on the inside, the laths being attached to battens projecting two inches from the logs, so as to leave a stratum of air between the logs and plaster. The doors and windows are double, and the outer door has the further protection of a closed porch. The small room, or office, is provided with an open fire-place, adapted for a wood fire; the instrument room has neither stove nor fire-place. No iron whatever was used in the structure, the nails being of copper, and the locks and other fastenings of brass. The instruments are supported by massive stone pillars, each formed of a single stone, about six or seven feet long, imbedded in masonry to the depth of three feet.

The foregoing details we have condensed from Lieut.-Colonel Sabine's introduction to the work, which comprises the observations made in 1840, '41, and '42, by the Lieutenants in charge, whose assiduity, efficiency, and talents, are highly commended by the gallant and scientific editor. Nor is it the less gratifying to find that the good conduct, intelligence, and zeal of the men, and the thoroughly efficient and trustworthy manner in which they performed their duties, are spoken of in terms honorable to the distinguished corps to which they belong.

Lieut.-Colonel Sabine has contributed (with the assistance of Lieutenant Riddell), about 100 pages of preliminary observations, under the head of "Adjustments, Abstracts, and Comments." To give even an outline of the immense mass of tabular information here submitted to the scientific reader, is far beyond our limited space, without serious encroachment upon the other departments of our Journal We would, if it were within our power, submit a few extracts, or the substance of such comments, where they immediately seem to call for particular attention, but we must keep within the bounds we have prescribed for ourselves.

We notice from the observations made on the subject of magnetic declination, that the following practical inferences are derived for the instruction of persons who may have occasion to employ the compass in surveying, and other similar purposes in Canada:—1st. That large deviations from the mean monthly direction of the needle, at the same hours, are least likely to occur from noon to 4 P.M. 2d. That at all other hours of the day, the liability to the occurrence of deflections exceeding five to six minutes from the mean direction at the same hours, is about three times as great as at the hours of two and four P.M.; at six P.M., the liability, as it may be estimated from the two hourly observations, is about one observation in twenty-eight, and at eight and ten P.M., rather greater. 3d. That the disturbances are usually deflections of the north ends of the needle *to the west* in the forenoon, and *to the east* from six P.M., to midnight, inclusive.

One of the principal objects to be attained from the establishment of the fixed Observatories, was the elucidation of the laws of the irregular fluctuations of the magnetic elements, and the determination of their local or universal character. To effect this, all the magnetometers were to be observed on certain days simultaneously at certain short intervals, and for twenty-four hours together. Twelve days, entitled Term days, were named in each year, one in each month, for this kind of observation; the intervals between the observations being five minutes for the declinometer, and ten for the magnetometers. Other national magnetic Observatories were

invited to co-operate in these simultaneous observations; and this invitation was, among others, quickly responded to by the directors of the Observatories at Boston and Philadelphia. The observations of these latter bodies, as far as they have been made, have been communicated to Lieut.-Colonel Sabine, and the whole have been projected upon a similar scale for comparative reference with those made at Toronto. The remarkable harmony in the curves of the three American Observatories on every one of the Term days, attests the reality of the phenomena, of which each affords an independent representation. The perturbations which took place in Toronto in the magnetic direction, and in the intensity of the magnetic force, are obviously common to a large portion of the North American continent. To effect a comparison of similar simultaneous observations made in Europe, the plates containing the American curves, embody also the results obtained from the observations made on the Term days, at Prague or Breslau, and which embody the magnetic perturbations common throughout the largest portion of the European continent. The correspondence so strikingly manifested in the fluctuations of the declination and horizontal force in America, and which has its counterpart in Europe, is not found to prevail in the same degree between the curves of the two Continents, when exhibited in comparison. Nevertheless, instances are not unfrequent of individual perturbations common to both Continents, having their culminating points at the same observation instant. There are sometimes disturbances in the same direction in both Continents, and sometimes in opposite directions. On the other hand, there are perturbations, and occasionally of considerable magnitude, on the one Continent, of which no trace is visible in the observations of the other.

Having thus premised these general observations on the work before us, we purpose, in our next, to present to our readers some of the tabular results, which have been deduced from the extended observations made and conducted in so creditable a manner to the parties invested with the charge.

PRACTICE OF MEDICINE AND PATHOLOGY.

ON THE DIAGNOSIS OF ANEURISMS OF THE AORTA.

By M. Gendrin, Physician to La Pitié, Paris.

The present memoir comprises the diagnosis of aneurism of each of the three anatomical divisions of the aorta.—Aneurism of the *ascending* portion, when it becomes evident externally, appears in the form of an hemispherical circumscribed swelling, which pulsates isochronously with the heart. The skin is not altered in colour till the latter periods of the disease. The patient generally complains of pain in the tumour, which is increased during the systole of the heart, and which becomes oftentimes much increased by motion, and during the digestive process. The tumour is more or less painful to the touch, and pulsates strongly.

If the aneurism be so small as not to have arrived at the walls of the chest, it may be recognized still by its impulse and by a dull sound on percussion, which indicates that the corresponding portion of lung is pushed on one side. Auscultation also reveals a double "*bruit de choc*," and a dry friction sound; a to-and-fro sound, in fact, is sometimes interposed between the systolic and diastolic bruits. If the site of the aneurism, and the heart be simultaneously examined, it is easily perceived that the sound given out by the aneurism is different both in seat and quality from that of the heart. The diastolic sound of the aneurism does not coincide with the second sound of the heart, but precedes it.

When the aneurism of the origin and ascending portion of the artery consists in simple dilatation of the arterial tunics, it gives rise to certain peculiar signs. Auscultation at the right border of the sternum, and over the cartilages of the second and third ribs on the *right* side, reveals the existence of only one bruit, combined with an impulse, which is synchronous with, and in some cases difficult to distinguish from the systole of the ventricles.

The aneurismal bruit, however, is heard almost as distinctly behind as before—while the heart's action is nearly inaudible in the back; moreover, the bruit depending on the heart is heard on the left side, between the scapula and spine—the aneurismal bruit on the right. This difference in the sounds in the posterior aspect of the thorax is sufficiently diagnostic.

There is in some cases but little pain in simple dilatation of the ascending aorta; and in general it gives rise to no more than a sensation of uneasiness and fulness under the sternum. In this respect it differs widely from aneurism depending upon erosion of the arterial tunics.

If the ascending aorta becomes the seat of considerable dilatation, or be enlarged by aneurism from rupture of its coats, the trachea is usually pushed slightly to the left side. A difference in the pulse in the two wrists is generally considered to be a diagnostic sign of aneurism of the aorta; this sign, however, is equally perceptible in simple arteries, and therefore has no value as a diagnostic. Dyspnœa is one of the signs of aneurism; but when the tumour is situated in the ascending portion, it is not constant, but occurs only upon exertion or mental disturbance. If, however, the aneurism be sufficiently large to compress the principal divisions of the bronchi, the difficulty of breathing is continuous, and becomes suffocative when muscular exertion is made; and in such cases the compression is indicated by the existence of a sibilous râle. When the walls of the bronchi become inflamed in consequence of the pressure, expectoration of tenacious mucus is superadded, and should warn us of the near approach of one of the terminations of the disease, by rupture into the respiratory passages.

In some cases the compression is not limited to the bronchi, but is exercised also upon the origin of the pulmonary arteries, particularly those on the right side; the dyspnœa is then greatly aggravated, and the patient usually is attacked with hœmoptysis. Lividity of the countenance is likewise present in these cases, on account of the deficient arterialization of the blood.

The dyspnœa in cases of aneurism of the origin of the aorta, is often the result of a coincident affection of the heart or pericardium. Valvular disease and endocarditis form a serious complication, as they induce in general a greater or less amount of a ventricular hypertrophy. The proficient in auscultation will not confound the symptoms of these complications with those of the original lesion; but still the diagnosis often becomes sufficiently difficult to require attentive investigation.

It is a common opinion that the asthmatic paroxysm frequently depends upon disease of the heart and large vessels; it is not difficult, however, to distinguish real asthma from the dyspnœa of cardiac disease. The former

is truly paroxysmal, and oftentimes periodic, the intervals being in some cases of great duration. There is, moreover, constantly present a cough, with expectoration and sibilant râles. In general, emphysema may be recognised by the physical signs proper to that lesion. The diagnosis is further elucidated by the absence of the special signs of aneurism or morbus cordis.

Again, angina pectoris is frequently referred to simple or aneurismal inflammation of the origin of the aorta. This also is an error. The symptoms of the two affections are distinct; for instance, the substernal constriction, and the neuralgic pain extending down the left arm, which are the essential symptoms of angina, are not necessarily present in aneurism. Sudden death also is common in the former but not in the latter. [This will doubtless appear a bold assertion, but it is nevertheless the author's exact expression.]

Aneurism of the *arch* of the aorta is generally situated in the interval comprised between the origin of the arteria innominata and the left carotid and subclavian. The projection of the tumour shows itself in the space included between the internal third of the second right rib, and the corresponding portion on the left side. It is also sometimes perceived in the hollow between the insertion of the sterno-mastoid muscles. When the aneurismal tumour of this part of the artery becomes apparent to the eye, it gives rise to symptoms identical with those lately mentioned. The aspect of the tumour is the same, and the pain has the same character, with the exception that it is perceived at the summit of the sternum, and between the shoulders. If the tumour does not project externally, its diagnosis is a matter of considerable difficulty, especially when the posterior portion of the arch is the part affected. The dulness on percussion in deep-seated aneurisms of the arch is somewhat obscure, and is therefore of little service as a diagnostic sign. The auscultatory phenomena are similar to those exhibited in aneurism of the ascending aorta, but are perceived in a different situation. In front they are heard at the summit of the sternum, and under the junction of the clavicle and first rib with that bone; behind, they are most evident on a level with the second rib, and close to the spinal column.

The deviation of the trachea is more decisive in aneurisms of the arch than in those of the ascending portion, but the apex of the heart is not displaced, as is occasionally the case in the latter. The pulse is deceptive as a diagnostic symptom taken *per se*, but is a valuable accessory sign, and is one by which we may judge of the exact site of the disease. If, as is commonly the case, the innominata is implicated in the aneurismal tumour, the pulse is feeble in the right wrist. When on the other hand, the left pulse is the feebler of the two, we may conceive that the disease is located at the left extreme of the arch.

The dyspnœa in aneurism of the arch, is subject to the same conditions as when the ascending aorta is the seat of the disease. It does not differ from the dyspnœa, which occurs in the latter case, unless the trachea be compressed. In that case, inspiration is remarkably difficult, and is accompanied by a whistling sound. In some cases the voice is enfeebled, or even entirely extinguished.

Of all forms of aortic aneurism, those affecting the *descending* part of the vessel are the most difficult to recognize. It is difficult to distinguish the impulse and the bruit, when perceived in front from those of the heart itself, but we may sometimes arrive at a diagnosis by compressing the abdominal aorta. This causes the second sound to cease, if it originates in the artery, but has no influence upon the cardiac bruits. If, however, to the double "*bruit de choc*," perceived in the front of the chest, is added a sibilant râle, and if the second sound slightly precedes the diastole of the heart, the existence of an aneurism may be considered certain.

Tho signs of aneurism of the descending aorta are perceived more plainly in the back than in the front of the chest. They are, as perceived in this situation, the double "bruit de choc," together with a rough or sibilant friction sound. If these signs are very evident, no doubt need be entertained of the existence of aneurism, especially if they are conjoined to a tearing, gnawing pain along the spinal column, which is aggravated by motion of the upper extremities.—*Ranking's Abstract of the Medical Sciences.*

ON THE CHANGES IN THE URINE EFFECTED BY DISEASE, AND THE TESTS TO DISTINGUISH THEM.

By E. J. Shearman, M.D., Member of the Royal College of Physicians of London, &c.

(*Read at the Sheffield Medical Society, March* 20, 1845.)

(*Continued from page* 138.)

3. We will now endeavour *to point out the easiest modes of detecting the contents of diseased urine*, under the following divisions—viz., 1. Crystalline contents; 2. Colouring matters; 3. Organic deposits.

The only necessary apparatus for these experiments are, a urinometer, test tubes, watch glasses, spirit lamp, and a good achromatic microscope. The re-agents are well known to the profession.

CRYSTALLINE CONTENTS.

Urea.—When this is in excess, the urine is of a high specific gravity, and generally of a reddish colour. By adding an equal quantity of nitric acid in a watch glass, it crystallizes at the bottom very soon as nitrate of urea; when the urea is in excess, it soon becomes solid. By combining with two atoms of water, urea is converted into carbonate of ammonia; and this accounts for urine becoming alkaline and pungent soon after it has cooled. A little excess of mucus aids this process.

Uric acid or *Lithic acid* is the substance of which the greatest number of urinary calculi is composed. The urine is high-coloured; specific gravity generally above 1.020, and contains an excess of urea. Uric acid, acting on the phosphate of soda and ammonia, (or microcosmic salt,) existing in urine, is decomposed; urate of ammonia is formed, and phosphoric acid set free, which is the cause of the acid re-action of urine. So that uric acid is usually found in the form of urate of ammonia. To detect it—warm the urine containing urate of ammonia in a watch glass, and the uric acid becomes deposited at the bottom of the glass, and, when viewed by the microscope, is seen crystallized in red rhombic prisms. It is familiarly known by the names of yellow and red sand. Heat does not dissolve it. Pure uric acid is only soluble in 10,000 parts of water at 60 deg., and is insoluble in alcohol. Liquor potassæ dissolves it, forming urate of potass. Hydrochloric and acetic acids have no action. It is dissolved by nitric acid; and by evaporation, a pink colour (becoming a rich purple on being held over the vapour of ammonia) is produced. This is purpurate of ammonia. Exposed to heat in a platinum spoon, it burns, evolving an odour of bitter almonds, and leaving phosphate of soda and lime behind.

Hippuric acid.—This is rich in carbon, and found plentifully in the horse and cow. Evaporate the urine to a syrup, add excess of hydrochloric acid; uric acid and hippuric acid will then be separated, and fall to the bottom; pour off the supernatant fluid, and wash in cold water; boil the residue in alcohol, in which hippuric acid is soluble, and uric acid is not, from which it gradually crystallizes in delicate coloured needles, very visible under the microscope. It is soluble in four hundred parts of water at 60 deg.

Urate of ammonia.—This is the *lateritious sediment*, soluble in 480 parts of water at 60 deg. The colour of this urine is from pale to crimson; specific gravity from 1.012 to 1.025;

it often contains floating masses. The deposits are from fawn colour up to purple; they never appear until the urine has cooled, and disappear by heat. Liquor ammoniæ and liquor potassæ dissolve them. The floating masses disappear by heat, contrary to albumen. When it becomes turbid from a drop of nitric acid, the microscope will show crystals of uric acid. A drop of urine containing urate of ammonia, examined on glass by the microscope, shows an amorphous powder, composed of myriads of minute globules; but add a drop of hydrochloric acid, the muddiness disappears, and crystals of uric acid will be seen, the ammonia having deserted the urate to combine with the acid. The colour of urate of ammonia is always owing to its union with purpurine. It is quite white when pure.

In examining numerous large deposits of urate of ammonia under the microscope, I have always found, on the addition of weak nitric acid, an appearance of globules so like pus, but more coloured, that I cannot avoid mentioning it particularly, for I have never seen it named by any author; and it is so constant in its appearance, that I am led to conclude it depends on some chemical combination of the animal matter of the urea with the nitrogen of the nitric acid.

Urate of soda.—Very rare, except in gouty diathesis, and fever treated by carbonate of soda. Heat does not dissolve the deposit so quickly as it does urate of ammonia.

Uric oxide, xanthic oxide.—Very rare, supposed to have some connexion with the yellow colouring matter of the urine, (hæmaphaein.) It resembles uric acid if noticed inattentively. Colour is salmon or cinnamon tint, not so red as uric acid. The deposit caused by uric oxide is a grey powder to the naked eye, but under the microscope resembles small particles of yellow wax. It is insoluble in solution of carbonate of potass, whereas uric acid is soluble. Ignited in a tube, it does not yield urea, and uric acid does.

Cystine.—This is very rare, and contains 26 parts in 100 of sulphur. This urine looks like diabetic urine, but it is of a very low specific gravity. It smells of sweet briar when fresh, but soon putrefies, and evolves sulphuretted hydrogen. It is usually found in scrofulous habits. Cystine forms a deposit like the pale variety of urate of ammonia; but, unlike that deposit, it is unaffected by heat, and it very slowly dissolves on the addition of nitric or hydrochloric acids. It is soluble in the mineral, and insoluble in the vegetable acids. Soluble in ammonia, the fixed alkalies and their carbonates, but insoluble in carbonate of ammonia. By heating on platinum foil, it burns with a disagreeable odour. An evaporated solution of cystine in ammonia under the microscope, crystallizes in six-sided laminæ very distinct. It requires caution to distinguish this from chloride of sodium in urine, which naturally crystallizes in cubes, but when combined with urea assumes an octahedral shape. The ammoniacal solution stains a white-glass bottle black, from the combination of the sulphur of the cystine with the lead of the glass.

Oxalate of Lime.—This salt was considered very rare in the urine, but Dr. Golding Bird has proved, in his lectures in the *Medical Gazette*, that it is even more common than the earthy phosphates. The urine is acid, has a naturally healthy appearance, the specific gravity from 1.015 to 1.025, generally with some epithelial scales, and always with a large quantity of urea, uric acid, or urates. To discover the oxalate of lime, set aside the chylous urine for many hours in a glass vessel; decant the upper eight-tenths of it; pour a little of the bottom into a watch-glass, warm it, and the oxalate will fall to the bottom; remove the top part of the fluid with a pipette, and under the microscope we find the beautiful transparent octahedral crystals of oxalate of lime; collect and ignite the crystals on platinum foil, oxalic acid is decomposed, and carbonate of lime left, which dissolves in dilute nitric acid, with effervescence. These crystals are unaltered by boiling in acetic acid, or solution of potass. They dissolve without effervescence in nitric acid.

Ammonia, or phosphate of soda, or microscomic salt.—This is usually decomposed by uric acid in the bladder: urate of ammonia is formed, the phosphoric acid being set at liberty, which becomes the source of the natural acidity of the urine. The very small proportion of soda combines with uric acid, forming urate of soda.

Ammonia-phosphate of magnesia, or *triple phosphate*, and the *phosphate of lime*, are nearly insoluble in water, unless it contains a very small proportion of any acid, or hydrochlorate of ammonia; consequently, in healthy urine these earthy phosphates are held in solution by the phosphoric acid. This urine is generally pale, wheylike, plentiful, and of low specific gravity, 1.005 to 1.015. When the urine is alkaline from disease, these salts deposit, and are always white, unless coloured with *blood*. They are soluble in weak hydrochloric acid, and insoluble in ammonia and liquor potassæ. Heat agglomerates the deposit into masses, but produces no other change. By adding a small quantity of ammonia to urine containing any earthy salts, deposits of triple phosphates take place, which, under the microscope, are seen either in minute white triangular prisms, stellæ or acicular prisms, or foliaceous crystals, and are very easily detected. These disappear on adding a drop of any acid. When the urine is alkaline these deposits are abundant.

Phosphate of lime is never found in crystals. It is a very opaque sediment, and a drop examined by the microscope between plates of glass, appears white by reflected, and yellow or brown by transmitted light.

To distinguish the deposits of the triple phosphates from pus and blood, nothing but their appearance under the microscope can be depended upon. From mucus, add hydrochloric acid, which will dissolve the phosphates, but *not* the mucus. From albumen add nitric acid, which dissolves the phosphates, but deposits the albumen.

Carbonate of lime is sometimes met with as a deposit in alkaline urine. It is formed from the decomposition of phosphate of lime by the carbonate of ammonia. To discover it, wash the deposit well with water, which dissolves the carbonate of ammonia, and add any dilute acid, which will dissolve the carbonate of lime with effervescence. Examined by the microscope, they appear beautiful small transparent spheres, like globules of glass, and strongly refract light.

Silicic acid has very rarely been found as a deposit in urine, but it is often used by impostors, which it is necessary to be aware of.

COLOURING MATTERS.

Purpurine.—This is a substance of great consequence to become acquainted with, as its presence always indicates serious functional or organic mischief in some of the organs connected with the portal circulation. It has been considered as the same substance as purpurate of ammonia, or the murexid of Liebig; but Dr. G. Bird has clearly proved it to be a substance *sui generis*. Purpurine is quite soluble in alcohol; purpurate of ammonia is insoluble. It always combines with urate of ammonia, causing that deposit to vary in tint from a mere flesh colour to the deepest carmine, and is often mistaken for blood. To distinguish it, dissolve the purpurine in alcohol, examine the rest under the microscope, and the absence of blood-discs will prove it. Of course, the appearance under the microscope is that of amorphous red urate of ammonia. If a small quantity is suspected, add hydrochloric acid to the warmed urine, and a colour, varying from lilac to purple, will immediately be produced, if purpurine be present. By evaporating urine containing it to a syrup, and digesting it in alcohol, we obtain a purple tincture, which colour is heightened by acids and diminished by alkalies. The specific gravity of urine containing this substance varies from 1.015 to 1.030; it is not altered in colour by boiling; nitric acid added to it often produces a copious deposit of uric acid, often mistaken for albumen.

Cyanurine gives a blue colour to urine; it deposits as a blue powder, which may be separated by filtering; freed from mucus, urates, and phosphates, by washing with water, and digested with hot sulphuric acid, from which it must be carefully precipitated by magnesia; or it may be obtained by boiling the blue deposit in alcohol, and evaporating it to dryness. It is insoluble in water; moderately soluble in boiling alcohol; soluble in diluted acids, which become brown or red. The solution, in sulphuric acid, leaves, by evaporation, a carmine-red extract, soluble in water. It is precipitated, unchanged, from an acid solution by ammonia, lime-water, and magnesia. It forms a red colour by dissolving in a hot solution of alkaline carbonates, and a brown one in pure alkalies. Distinguished from indigo by not sublimating when heated in a tube, and from percyanide of iron by not yielding sesquioxide of iron, when treated with carbonate of potass; very rare.

Indigo gives a dark-blue colour, which deposits by repose in urine, and may be collected on a filter. It dissolves in strong sulphuric acid, forming a purple solution. Nitric acid converts it into nitro-picric acid; carefully heated in a tube, it sublimes in purplish red crystals. The best test is, to heat the deposit in a tube, with a little grape-sugar, in a mixture of equal parts of alcohol and liquor potassæ; the blue colour disappears and it becomes yellow. By agitation and exposure to the air it becomes red, and at last green—from the reproduction of blue indigo. This also is rarely met with.

Percyanide of iron, or Prussian blue, now and then occurs when iron has been taken some time as a medicine, by combining with cyanogen—the result of the re-arrangement of the atoms of urea. It consists of a blue powder, insoluble in water and alcohol. Digested with liquor potassæ its colour is destroyed, sesquioxide of iron being liberated, and a yellow solution of ferrocyanide of potassium being formed. This solution is precipitated blue by sesqui-salts of iron, and brown by sulphate of copper.

Melanourine and melanic acid are rarely found in urine; their chemical composition is not yet sufficiently known.

Hæmaphacin is the yellow colouring matter of the urine, which gives to urate of ammonia its yellow colour.

Cholesterine is a substance very rich in carbon, is supposed partly to give the colouring principle to the bile, and is often detected in urine in the form of bile.

ORGANIC DEPOSITS.

In addition to the former substances found in urine, the elements of blood, albumen, hæmotosine, and blood-discs, pus, mucus, organic globules, epithelium, milk, fat, sugar, bile, spermatozoa, and vibriones, are often discovered. Very few remarks on each of these substances may suffice.

Blood.—Urine containing blood coagulates into blackish masses, like currant jelly, and often comes from the urethra in pieces like leeches. The urine containing the liquor sanguinis coagulates spontaneously, and looks like blanc-mange, owing to the fibrin in it. To detect blood, boil and filter the urine; brown coagula of hæmatosine and albumen will remain on the filter. Add liquor potassæ, and if blood be present, a greenish solution will pass through, from which white coagula of protein may be precipitated by hydrochloric acid.

Urine containing blood becomes darker in colour by boiling, but not so if the colour is owing to purpurine. Uric acid is not affected by heat, and is distinguished by the microscopic character of the deposit; bile, by its characteristic tests; hæmatoxylon, by the dark precipitate produced by sulphate of iron, and absence of coagulation by heat.

The blood-corpuscles, particles, discs, or globules, are shown most distinctly by the microscope, as little rings; but, by minute examination, are really double concave discs, of a uniform size, and yellow colour.

Albuminous urine is clear, straw-coloured; sometimes a dingy red, from blood, and then it contains less albumen. Its specific gravity ranges from 1.008 to 1.012. It may be detected by heat, nitric acid, bichloride of mercury, ferrocyanuret of potassium with acetic acid, and caustic potass.

1. Put the urine into a test tube, hold it over a spirit-lamp, and, if the urine is acid, and contains albumen, it will become opaque without boiling; and the more albumen it contains, the more solid will the urine become as the heat is increased. If the precipitate is owing to the earthy phosphates, it disappears by adding any acid. Sometimes heat, long continued to ebullition, will produce a deposit from urate of ammonia, but this only occurs from the long continuance of the ebullition. If the urine is alkaline, heat will not deposit albumen, but nitric acid will.

2. By adding *strong nitric acid* to albuminous urine in a test tube, an immediate coagulation of albumen occurs; but this happens sometimes in patients under the influence of copaiba, cubebs, and other resinous drugs; and is distinguished from albumen by not being deposited by heat.

3. A saturated solution of *bichloride of mercury* precipitates albumen a dense white.

4. *Ferro-cyanuret of potassium* gives a flocculent precipitate (white) with albuminous urine, to which a few drops of acetic acid has been added.

5. A solution of *caustic potass* produces a white precipitate of gelatine.

Pus.—This urine is generally acid or neutral, and slow to become putrid; by repose, pus falls to the bottom, like cream, of a greenish colour, not hanging in ropes like mucus, and mixing with the urine on agitation, acetic acid having no effect on it. On mixing the deposited pus with an equal quantity of liquor potassæ, a dense, semi-opaque, gelatinous mass is formed, which can scarcely be got out of the tube. Albumen can always be detected in the urine containing pus. Agitated with æther, fat is dissolved; which, on evaporation, is found in globules. Alkaline urine requires great care in detecting pus. Phosphatic deposits sometimes resemble pus very closely; but by microscopic examination the pus particles are distinctly seen floating in liquor puris, which is coagulated by heat and nitric acid; they are white, round, roughly granulated outside, and much more opaque than blood corpuscles. By adding a drop of acetic acid to them while under the microscope, the interior of the particles becomes visible, and is found filled with several transparent nuclei. The earthy phosphates give their usual crystalline appearance.

Mucus.—Urine depositing mucus is generally alkaline; it soon putrefies; becoming almost ammoniacal in the bladder. It is very viscid and tenacious, forming a continuous rope when poured from one vessel to another. If the upper stratum of urine is acid, the mucus is always alkaline. Mucus will not mix with urine as pus does.

Acetic acid corrugates the mucus into a thin, semi-opaque membrane, which at once distinguishes it from pus. Mucus urine contains no albumen. Æther dissolves scarcely any trace of fat. When the urine contains a large quantity of earthy phosphates, it is difficult to distinguish between pus and mucus, except by the microscope. The microscopic appearance of mucus granules is very like pus, but they float in a viscid glairy fluid, (liquor muci,) which does not coagulate by heat or nitric acid.

Organic globules, large and small, can only be detected by the microscope; they are larger than pus and mucous granules, and have a darker colour. They are very common in albuminous urine.

Epithelium.—These are a part of the mucous membrane of the genito-urinary organs. Under the microscope, they appear like oval or angular flattened cells, with a centre nucleus.

Milk.—In utero-gestation, I have found milk in the urine: and Dr. G. Bird gives very clear and satisfactory proofs of its frequent occurrence. To detect it, allow the suspected urine to repose in a cylindrical vessel, exposed to the air, for several days, and the milk (kiestein) will rise to the surface in a fat-like scum, remaining permanent for three or four days.

Fatty urine has the appearance of diluted milk; it often spontaneously gelatinizes, like blanc-mange, on cooling. This is called chylous urine by Prout. On agitating the fresh urine with an equal bulk of æther, the fat is dissolved, and when the æther is evaporated in a watch-glass, it leaves globules of oil. The urine always contains albumen.

Spermatozoa.—When in the acid urine of a man there exists a cloud, which is not cleared by nitric acid or heat, this may be suspected. Allow the urine to subside in a conical vessel; decant the top, and view a drop of the bottom under the microscope. These minute beings will be easily detected as minute ovate bodies, with a bristle-like tail; which is more distinct when viewed dried on the glass.

Bile often tinges the urine a deep-brown colour. In addition to the old method of dipping in a bit of linen, and drying it, the following are the best modes of detecting bile:—

Pour a small quantity of urine on a white plate, so as to form a very thin layer. Carefully add not more than a couple of drops of nitric acid in the centre; an immediate play of colours, in which green and pink predominates, results.

Add to a few drops of the urine, on a white plate, a little strong sulphuric acid; when the mixture becomes hot, add a drop of saturated solution of lump sugar. It immediately assumes a fine purple colour.

Sugar is the principal ingredient in the urine of diabetes mellitus. It is generally clear, of a lemon colour, secreted in large quantity, and of the specific gravity of from 1.030 to 1.055. When this urine is left in a warm place, a scum forms on its surface, which, if examined by the microscope, consists of what are called torulæ; and if put into syrup, grow so quickly as to be seen under the microscope almost increasing. The sugar of this urine is like the grape sugar. The following are the best tests:—

1. Evaporate the urine to an extract; digest it in hot alcohol; when cold, allow the tincture to evaporate spontaneously in a cupping glass, when white glanular masses of sugar will crystallize on the sides of the glass.

2. *Trommer's test.*—Add to the suspected urine, in a large test tube, just enough solution of sulphate of copper to make it a faint blue, a deposit of phosphate of copper falls; add liq. potassæ in great excess, hydrated oxide of copper first falls, which re-dissolves in the excess of alkali, forming a blue solution like ammoniuret of copper. On gently heating the mixture to ebullition, a deposit of red oxide of copper falls.

3. *Capezzuoli's test.*—To the urine in a conical glass vessel add a few grains of blue hydrated oxide of copper, and render it alkaline by the addition of liquor potassæ. If sugar be present it assumes a reddish colour, and in a few hours the edge of the deposit of oxide becomes yellow, which gradually extends through the mass, from a reduction of the oxide to the metallic state.

4. *Moore's test.*—Add to 3ij. of the suspected urine in a test tube, half its bulk of liquor potassæ; heat it over a spirit lamp, and keep it boiling for a minute or two; the pale urine will become an orange brown, or bistre, according to the proportion of sugar present.

Vibriones are minute animalcules, occasionally developed in urine, which is pale, neutral, and of a low specific gravity, and speedily becomes putrid. Under the microscope these animals appear minute linear bodies, not so long as the diameter of a blood-disc; they are alive, and move, in an oscillatory manner, *in fresh urine.*

5. To recapitulate.

Gentlemen, I will only detain you another moment, while I beg to assure you that it is a very easy task, after a very few trials, to discover, in a few minutes, the contents of almost any ordinary specimen of urine; and, without this knowledge, it is quite impossible to become acquainted with the changes which are constantly occurring in the urinary organs.

For instance, you are called to a patient complaining of excruciating and deep-seated pain in the abdomen, shooting down the thigh, which resists the usual soothing mode of treatment. Examine the urine, and you may there find blood, pus, oxalate of lime, uric acid, or phosphates. This at once explains the nature of the malady, and you can confidently tell your patient that he has a small calculus of a certain description in the ureter, and your treatment is no longer empirical. Or you may be consulted by a person with various anomalous symptoms of a cachetic nature, which you would find it impossible to give a name to unless you examine the urine chemically, when you discover either albumen, sugar, or oxalate of lime excreted; and this at once explains the case.

A patient consults you, much reduced in strength, depressed in spirits, and emaciated, his appetite being good, and digestive organs healthy, as far as you can discover, there being no evident cause for such a state. Take the specific gravity and quantity of the urine. If it is high, without deposit, and the quantity not great, add nitric acid to it in a watch-glass, and you will most likely discover a large quantity of urea, sufficient at once to account for the symptoms; or if the quantity of urine be large, you may discover sugar.

During the course of febrile and inflammatory diseases, urate of ammonia is generally deposited. But if the symptoms increase, instead of diminish, under this deposit, examine it, and perhaps you may find the deposit to consist of phosphates and purpurine, and the urine alkaline. This will at once warn you to be watchful of your patient, and cautious in your prognosis.

Suppose you have a surgical operation to perform on a patient apparently out of health, but with no decided disease. If, on examining the urine, you find albumen, oxalate of lime, or the ammonio-phosphates of magnesia in abundance, you may feel assured the person is in an unfit state to bear any operation; and by waiting, and attending to his general health, you will feel more confidence in the successful event of such an operation.

Although Sir B. C. Brodie, Dr. Prout, and other late writers on diseases of the kidneys, have laid great stress on the cachetic state of the system, accompanied by alkaline urine, it was reserved for the splendid discoveries of Bright and Bird to elucidate the real value of these pathological changes.

The little that I already know of this subject has convinced me that, when properly studied by medical practitioners, they will find in it as true a diagnosis to the diseases of the abdominal and extra abdominal viscera, as percussion and asculation are to the diseases of the chest.

The various deposits of a great number of specimens of urine were then successively exhibited to the members.—*London Lancet.*

ON THYMIC ASTHMA.

BY M. TROUSSEAU.

A great deal has been written of late in Germany, says M. Trousseau, on *thymic asthma*—a disease first described a few years ago by Mr. Hood of Kilmarnock. In this "newly discovered" disease, the thymus gland is stated to give rise to convulsions and sudden death in infants by its enlargement. The existence of such an affection was from the first questioned by French pathologists, and M. Trousseau now states that his researches have proved to him, in the most satisfactory manner, that there is no such disease. The facts brought forward by the German physicians must be admitted, he states, but the interpretation which they give of these facts is erroneous. Instead of being instances of an undescribed form of disease, they are merely illustrations of *partial convulsions.* The analysis of the phenomena of convulsions in children has proved to M. Trousseau that such is the real nature of the cases narrated by Kopp and other physicians, as examples of thymic asthma, as well as

partly, of others described under the name of *laryngismus stridulus* or *acute asthma of Millar*. The following is a brief analysis of M. Trousseau's views on the subject:—In children, convulsions (*éclampsie*) generally present the epileptic form. The child screams, becomes stiff, twists its body, the thorax being fixed, and the respiration suspended. The face, at first pale, becomes violet; the veins are distended; then follow clonic spasms, at first rapid, then slow; after which a deep expiration and general muscular relaxation close the fit leaving more or less somnolence and stupor. The attack lasts one or two minutes. One paroxysm may be followed nearly immediately by another; indeed, they may succeed each other indefinitely, constituting an "état de mal."—But when this is the case, the convulsions are not continuous, although sometimes considered so. They may however, be continuous, and last for hours, or even days.—When this is the case, the attack is often ushered in by an epileptic paroxysm, as above; but the spasms, instead of ceasing, are repeated every second, or at short intervals.—The convulsions are continuous, because there is never any complete cessation, nor the deep stupor which follows an ordinary paroxysm. In this form of convulsion, the child, although convulsed, does not lose all consciousness—an important feature in the disease. He cries, to express a want, or to complain of a pain, and is able to withdraw his hand when it is pinched or tickled. The convulsion is not therefore as universal as it appears, it is, rigorously speaking, *partial*.

Convulsions may be still farther localized. After a severe epileptic attack, one half of the body may remain for some hours affected with clonic spasmodic motions, and yet the intellect of the child be clear, and the motions of the other side of the body harmonious.

The convulsions hitherto described are easily recognized; but convulsions may be internal as well as partial, and then they are by no means so easy to appreciate; then, also, it is, that difference of opinion as to interpretation of the symptoms begins to be entertained. Internal convulsions are partial convulsions, occupying more particularly the muscles of the globe of the eye, of the pharynx, of the larynx, and of the apparatus of respiration. The most ordinary form of internal convulsions is characterized by turning of the globe of the eye with mobility, nearly total loss of consciousness, or at least a certain amount of stupor, extreme difficulty or impossibility of deglutition, and by respiration uneven, sometimes scarcely perceptible, sometimes deep and blowing—in a word, by an attenuation of most of the phenomena of epilepsy, and by the absence of the violent convulsions of the limbs and face.

Sometimes the diaphragm and the inspiratory muscles of the abdomen and of the chest alone act, and then, for one, two, or three minutes, a peculiar laryngeal blowing sound is heard, as if there existed an obstacle to the entrance and to the exit of the air. If the proper muscles of the larynx are at the same time convulsed, as their motions do not coincide, the disordered condition of the respiration appears alarming, although it is only really so when this state is much prolonged. Such is the real explanation of those states of disordered respiration which have been called thymic asthma, or laryngismus stridulus. A want of harmony between the spasmodic motions of the diaphragm, and of the muscles which move the arytænoid cartilages is sufficient to produce the laryngeal sibilus, the orthopnœa.—In the regular act of inspiration, the superior part of the larynx opens at the same time that the diaphragm descends, and produces a vacuum in the chest. If the contraction of the diaphragm takes place too rapidly, and if, at the same time, there is a spasm of the larynx, as in the hooping-cough, the inspiration becomes nearly impossible, and is accompanied by a violent sibilus. In the case which we are examining, however, it is not necessary to call to our assistance a want of harmony between the movements of the diaphragm and those of the muscles of the larynx; it is sufficient to suppose that the will or the instinct no longer preside, for a moment, over the movements of the arytænoidean cartilages; the muscles which move them, no longer obeying any nervous impulsion, are for the time in the condition of those of animals in whom the recurrent laryngeal nerve has been divided.

The above details explain how it is that thymic asthma, so frequent in the eyes of some observers, is never found by others. The former attribute to an increase in size of the thymus, accompanied by paroxysmal accidents, what the latter consider to be merely one of the forms of convulsions in children. The thymus, like the supra-renal capsules, is an organ of transition, destined to become atrophied after the birth of the human fœtus, and less than any other organ likely to be hypertrophied. During the six years that M. Trousseau has been at the head of important wards for very young children, *he has not once met with the thymus gland sufficiently enlarged to give rise to the slightest accident*.

M. Trousseau concludes his essay, by promising, in a future article, to point out the connection which exists between convulsions and laryngismus stridulus and the acute asthma of children. At the same time, he thinks it right to state, that these diseases are not mere forms of infantile convulsions, as is the case of thymic asthma.—*Dub. M. Press.*

YELLOW FEVER OBSERVED IN PARIS.

The *Gazette des Hôpitaux* for August, contains the account of a case of typhus which has recently occurred in the wards of M. Rayer, at the Charité, and which presented most of the symptoms peculiar to the yellow fever of tropical climates. It may also be compared to the fever recently observed in Scotland, and so admirably described by Dr. Cormack.

On the 30th of June, 1845, a man named Thomas, of strong constitution, entered M. Rayer's male ward. He had been ill for a few days only. The following were the symptoms presented:—Yellow orange tinge of the entire body; skin dry and hot; the eyes and inferior surface of the tongue yellow; the superior surface of the tongue covered with a mucous fur; nausea; slight tympanitis of the abdomen, which is painful on pressure in the right hypochondrium; liver of normal size on percussion; the stools coloured by bile, not abundant; urine deeply tinged with bile; no abnormal thoracic symptom, but acute pain is felt in the hepatic region on deep inspiration; pulse full, frequent, but regular. The patient only complains of pain in the right hypochondrium, and of intense cephalalgia. Venesection to twelve ounces. Blood presents a thick buff.

July 1st. Same state. To be cupped on the hepatic region; blister on the same region. Saline purgative.

2nd. Vomiting sets in; the matters vomited are black and sanguinolent; the stools, liquid and abundant, contain black blood and fœces tinged with bile; the pulse is very frequent; cephalalgia; somnolence; tongue dry and cracked; teeth presenting a brownish crust at their basis; abdomen meteorized, not painful on pressure.

This state persisted on the 3rd and 4th. On the 5th, slight delirium appeared; no spots or ecchymosis on the skin, universally of an orange-yellow. On the 6th, the state of the patient seemed improved. A number of small conical elevations appeared on every part of the body, similar to those of variola in its first stage. On the 5th, these elevations had formed so many red ecchymotic spots, like those of hæmorrhagic roseola. There was, however, no symptom of roseola. The patient appeared indeed better, although still in a state of semi-somnolence. On the 8th, the somnolence had increased; an eschar appeared on

the sacrum ; the stools were still sanguinolent. On the 11th, the eruption disappeared ; somnolence and general depression increased ; nausea, but no vomiting. On the 12th, he remained in a state of comatose sleep, and died suddenly on the 13th.

Autopsy twenty-eight hours after death.—The body is in a state of advanced putrefaction ; the epidermis separating with the greatest ease ; icteric tinge of the skin the same as during life ; no effusion of blood in the intermuscular spaces ; lungs healthy, but containing a considerable quantity of mucus and blood ; heart soft, containing black blood ; the mucous membrane of the stomach softened, of the colour of dregs of wine ; the duodenum presents traces of sanguineous suffusion, and contains yellow bile ; the rest of the intestines contain mucus coloured with bile ; Peyer's glands are not enlarged ; no morbid alteration in the large intestine ; the liver presents the usual volume ; it is soft, of an uniform icteric tinge ; the vena porta, vena cava, and its principal divisions, are healthy, and contain black fluid blood ; the biliary vesicle contains a considerable quantity of blood ; the spleen is soft, of normal volume ; the kidneys soft, yellow, nearly diffluent ; the brain soft, and presenting the icteric tinge.—*Lancet.*

SURGERY.

ON ARTIFICIAL ANUS.

By Sir P. Crampton, Bart., Dublin.

[In the excellent memoir on this subject, which appeared lately in the British and Foreign Medical Review, (see Retrospect, Vol. X., Art. 58,) the reviewer regrets that for want of a sufficient number of facts, a very material point has been left undecided—namely, as to whether the power of retaining the fæces continues after the perineal operation of M. Amussat.

Sir P. Crampton, at a meeting of the Dublin Surgical Society, said it would give him great pleasure to supply this hiatus, by detailing the results of an operation for artificial anus performed by M. Amussat about nine years since.]

The nature of this congenital deformity was as follows :—" The vagina and anus were both naturally formed externally, but the recto-vaginal septum was deficient above, and only existed inferiorly to the extent of about one-third of an inch, so that the finger could be passed from either canal into the other. The upper portion of the rectum had no communication with the *cloaca* common to the vagina and the anal portion of the rectum, but its closed extremity could be felt at a height of about two inches towards the left sacro-isciatic angle. The anus thus communicated directly with the vagina above the imperfect septum already mentioned, but had no connection with the rectum, which terminated two inches above it, and was, in fact, properly speaking, *deficient* to that extent. Under these circumstances, M. Amussat determined to make an incision anterior to the coccyx, but posterior to, and not involving the vaginal anus, to detach the posterior wall of the vagina from the coccyx and sacrum with the finger or the knife, to reach the culde sac of the rectum, seize it with a hook, detach its entire circumference rather with the finger than by the knife, draw it down to the external wound, open it freely, give exit to the meconium, and secure, by points of interrupted suture, the edges of the opening in the intestine to the lips of the cutaneous wound." For two months the child went on well, the opening being maintained by the introduction of an ivory stopper, not much thicker than a full-sized quill, or moderately-sized pencil case. The introduction of the stopper, however, became more and more difficult every day, and at length the child's mother found it impossible to introduce it. The child was then brought to him (Sir P. Crampton) in the following state :—She passed, with considerable pain, a small quantity of semi-fluid fæces, and appeared in great agony, under which she must have very soon sunk. He enlarged the opening to such an extent as to receive a bougie of sufficient size, the introduction of which it is still necessary to repeat for a few hours almost every day. This case then, he would say, supplies the desideratum mentioned by Dr. Williams, for it appears that the rectum has full power of retaining the fæces. M. Amussat had been severely criticized for not having operated so as to restore the original anus, by dividing the partition which separated it from the rectum above, and so restoring the continuity of the canal : but in that case it would have been impossible to have saved the child from the misery of a recto-vaginal opening that would have admitted of a free passage of fæces from the rectum to the vagina. Whatever may be the ordinary condition, then, of the parts in artificial anus, as relates to the existence or non-existence of a sphincter and levater ani, no such structure could have exercised any influence in the case in question, as the artificial anus was formed between the coccyx and the rectum. M. Blandin's apprehension therefore that incontinence of fæces must be the result of the perineal operation, in consequence of the non-existence of a sphincter, is without foundation.

[Dr. O'Beirne thinks that this case produces abundant evidence of what he has endeavoured to establish—viz., that the existence of a sphincter is not absolutely necessary to the retention of the fæces. This necessity, he believes, is to be attributed to the contracted state of the upper part of the rectum.

Dr. Ireland has taken the trouble to obtain answers to queries on the subject from a lady who had suffered from this accident. One of the facts elicited was, that after the bowels were freed, she had merely to perform the necessary ablutions, and from that time till the next stool, the vagina and rectum remained perfectly free from fæces.

Dr. O'Beirne considers that it is our duty, if possible, to avoid making an opening into any part of the colon, and that in cases of stricture it might be avoided. The failure in the use of instruments in cases of spasmodic stricture, he attributes to want of sufficient boldness in their use, and mentions a few facts to embolden practitioners, and to show the impunity with which the most obstinate constriction of the bowel in question might be overcome.]

These facts were as follow :—Of all the diseases in which constipation is most obstinate, tetanus is certainly the one. In some cases of this disease which had terminated fatally, he succeeded in passing the instrument to a considerable height, but only by means of long-continued, gradually increasing, and determined pressure against the point of resistance ; when first he used this force, he remembered the instrument passed rapidly upwards, as if through a narrow ring, giving to his hand a sensation as if he had perforated the walls of the intestine ; accordingly he withdrew the tube, and was much pleased to see its extremity coated with fæces, and bearing no marks of blood. This circumstance had occurred to him not once but twenty times in the treatment of those fatal cases to which he alluded. In those cases it was found after death that the whole of the colon was so enormously distended as to conceal the other intestines, and to equal in size the thighs of a very large man, while the uppermost part of the rectum was contracted to the diameter of the barrel of a quill, but felt much firmer. On cutting into the intestine at this point, neither the serous nor the mucous coat were found in the least thickened, neither did the muscular coat exhibit any signs of thickening other than that caused by the powerful contraction of its fibres upon themselves. It was quite evident in these

cases that even this firm stricture was forced at each introduction of the instrument, so as to enable the bowels to be freed. Why, then, should we be deterred from employing a sufficient degree of force in other cases when the degree of resistance is infinitely less? When the difficulty of introducing the tube is great, the application of a blister over the sacrum, extending up a little on the spinous processes of the lumbar vertebræ, would be found a considerable assistance; and in order to effect this rapidly, if the case be very urgent, a sponge should be impacted into a tumbler, boiling water poured upon this, throwing it off repeatedly in order to produce the necessary degree of heat, and then the tumbler could be inverted over the part to be blistered. Having thus disposed of spasmodic stricture, he would now say, that in cases of the organic kind, every success might be obtained by the same means, with this difference—namely, the use of small tubes gradually increased in size. With respect to malignant stricture of the rectum, he was of opinion that this might be a legitimate case for the lumbar operation.

[Dr. Williams says that the great difficulty in the formation of an artificial anus in the lumbar colon consists in the difficulty of distinguishing the colon from the small intestine, for the signs mentioned by M. Amussat, whether taken separately or collectively, are not diagnostic, consequently there is always a risk of opening the peritoneum, and thus sacrificing the entire principle and chief advantage of the operation. M. Amussat has however discovered a sign which bids fair to do much towards removing the difficulty in question.]

This sign rested on the fact that the small intestines sustained a motion of alternate ascent and descent corresponding to expiration and inspiration, in which the lumbar colon did not participate; if, therefore, the exposed intestine presented this oscillation, it was the small intestine—if it did not, it might be presumed to be the colon. As M. Amussat made no mention whatever of this distinctive sign in any of his publications on the subject, it was very satisfactory that it had now been made known and recorded.

[At another meeting of the Surgical Society of Ireland, Dr. O'Beirne states that in his work on Defæcation, he thought it was satisfactorily shown that the cæcum is perhaps of all parts of the intestinal canal, that most peculiarly subject to large accumulations, while at the same time there may be no fæcal matter in the sigmoid flexure of the colon.]

In the natural process of defæcation, as it is called, the difficulty of transferring the load from the cæcum to the sigmoid flexure was formerly a kind of riddle to physiologists: the fæcal matter having obviously to rise, not only against gravity, but being also resisted by a quantity of flatus, which acts as powerfully as air would if admitted into a thermometer to resist the rising of the mercury. In his work he has satisfactorily shown how the transfer takes place, and how the introduction of the tube, by permitting the flatus to escape, so materially assists that transfer.

[Dr. Woodroffe then mentioned that he had been at Paris lately, and through the kindness of M. Amussat, had seen the patient on whom he had recently operated.]

She opened her dress, took off a belt she wore round her waist, and withdrew a *bouchon*, with a tape attached. While he (Dr. Woodroffe) sat near her, he could not detect the slightest offensive smell, nor was there the least redness or excoriation of the skin in the neighbourhood of the opening. While the plug was withdrawn she allowed him to pass in his finger, which he did to a considerable extent before he reached the intestine.. He would observe that she appeared to have a sort of sphincter power over the opening, being able to repress the discharge by an effort of the will; she had perfect use, too, of all the muscles of the trunk. Having arranged her dress she left the house, and he was surprised to see her trot along the street at the rate of four miles an hour.—*Dublin Medical Press, Feb.* 1845, *p.* 117.

CASE OF POPLITEAL ANEURISM CURED BY COMPRESSION.

In the last number of the *Provincial Journal*, Mr. Jolley surgeon to the Torbay Dispensary, relates a case of popliteal aneurism cured by pressure upon the artery above the tumour. The author of it appears to be ignorant of the successful results of the treatment of aneurism by compression in Ireland within the last few years. "Three successful cases (he observes) have been published, two by Mr. Liston, and one by Mr. Greatrex, surgeon of the Guards. I believe (he adds) we are indebted to Mr. Liston for this new era in surgery." We cannot help saying that it would be most desirable if gentlemen, in prefacing their cases by statements of this nature, would take the trouble previously to ascertain their correctness, and to inform themselves of the exact facts; instead of but three cases, twelve have been already published, eight of which were treated in Dublin, where also this method was re-introduced by Dr. Hutton, and shown to be effectual, simple, and but little painful.

We quote Mr. Jolley's case now, because if the clumsy and unscientific mode of using pressure by a tourniquet can succeed in curing an aneurism, compression, carried out in the way in which it has been employed in Dublin, is far more likely to be effectual.

"Thomas Wotton, aged 38, applied at the Torbay Dispensary in July, 1844. He stated that in April he used great exertion in walking from Teignmouth; when within a short distance of his abode, he was suddenly attacked with pain behind his right knee, and with difficulty reached home. On his arrival he found a swelling of the size of a walnut, which throbbed violently; he was unable to rest, and on the following morning attempted to walk, but failed.

July 15th. The tumour had much increased in size, and his nights were extremely restless. The hydrochlorate of morphia was prescribed.

22nd. Several professional friends saw him; all agreed that the case was one of popliteal aneurism, but, from his debilitated state, not one for operation.

23rd. It occurred to me to try the treatment adopted by Mr. Liston, and having procured a tourniquet, I placed it at the upper part of the thigh, maintaining pressure upon the vessel, and continued the morphia.

25th. The pressure of the instrument had caused considerable uneasiness, but no excoriation or sloughing. Increased the hydrochlorate of morphia to three-quarters of a grain at night.

27th. Lessened the pressure of the instrument, as the patient complained of the great uneasiness and restlessness. Repeated the morphia.

30th. The patient appeared in better spirits, and strength improved. Increased the pressure of the instrument.

August 5th. The tumour appears to have become more circumscribed; he suffers less pain in his leg than formerly. Continued the morphia.

15th. The tumour is very hard, there is a slight pulsation, and the bruit is much less distinct than formerly.

25th. The leg was bandaged by a flannel roller from the foot upwards, and a pad of lint placed over the aneurism.

September 1st. No more severe pain; the tumour has considerably decreased; the murmur is still heard, but no pulsation is felt in it or in the course of the artery between the aneurism and the seat of pressure.

10th. This day the press-artère was removed, but the leg bandaged from the toes, and the compress kept over the

aneurism ; there was slight œdema of the leg and thigh, but the feet were warm, and sensation was tolerably perfect.

20th. Appeared to be perfectly free from any of the symptoms, and requested to be allowed to take exercise.

July 10th, 1845.—The patient has remained perfectly well since."

ON AMPUTATION AT THE KNEE.

By James Syme, Esq , Professor of Clinical Surgery in Edinburgh University.

[There are few operations in Surgery which have excited much more discussion, or afforded room for the exercise of more ingenuity, than amputation of the thigh. And although the various modifications which have been introduced have certainly had the effect of restraining the hemorrhage, diminishing the suffering, and promoting union of the wound, the average frequency of deaths is still not less than from 50 to 70 per cent., whilst protrusion of the bone is a frequent sequela. Mr. Syme says that—]

Having seen the circular incision give place to the flap operation, and having witnessed the results of these methods variously modified, in the hands of many surgeons possessing every degree of operative skill, I am at length led to the conclusion, that there is something radically wrong in the principle of the operation. This error I believe to be, dividing the thigh-bone through its shaft instead of the condyles or trochanters.

The most frequent occasion for amputation of the thigh is afforded by disease of the knee-joint. Next to this may be ranked compound fractures of the leg and thigh ; and then, tumours growing from the bones of the leg and thigh. Now, in regard to diseases of the knee-joint, it is well ascertained, that the warrant for amputation lies in the bone, and not in the soft parts, which, however much altered through scrofulous degeneration or suppuration, readily admit of restoration to their natural condition, as is clearly shown by what happens after excision of the elbow, or amputation at the ankle-joint. In so far, therefore, as removal of the disease is concerned, it is plain that amputation through the condyles of the thigh-bone would in this case prove sufficient. As to compound fractures of the leg, it will be admitted that if the integuments and muscles admit of the limb being removed at the middle, or lower third of the thigh, they cannot present any obstacle to a few inches more of the bone being preserved, while similar injuries of the thigh obviously require amputation at the trochanters. The same observation will apply to tumours of the bones, those of the tibia and fibula not requiring any more of the thigh-bone to be removed than may be suggested by convenience, and those of the thigh-bone itself demanding the highest practicable point of section. From this analysis it appears that taking merely the morbid condition into account, all the cases admitting of amputation at or below the middle of the thigh-bone, would admit of the operation being performed through the condyles.

In proceeding to consider the relative advantages and disadvantages of amputating through the shaft and condyles of the thigh-bone, it may in the first place be remarked, that this, the largest member of the skeleton, contains the most extensive medullary cavity, and possesses the thickest mass of dense osseous tissue. Dense bone dies more readily than that of a spongy or cancellated structure, and the action of a saw, to say nothing of ruffling the periosteum, must always be apt to cause exfoliation, which by impeding union of the soft parts, delays union, and opposes its perfect completion, by increasing the scope afforded to contraction of the muscles. It would, however, be a narrow view to suppose that the direct effect of local injury is alone concerned in causing death of the bone after amputation; and there can be no doubt that inflammation of the medullary membrane may co-operate, if it does not sometimes act exclusively in its production. The most conclusive evidence in support of this opinion, is presented by those conical-shaped exfoliations, extending up the interior of the bone, sometimes to the length of several inches, which are occasionally extracted from stumps. One of these in my possession, taken from the humerus, is five inches long. And I believe the thigh-bone would be more fruitful of such exfoliations if amputation through it were not so fatal. But if the medullary membrane be liable to inflammation, suppuration of its texture, and inflammation of the veins cannot fail to be the frequent consequence, especially in hospitals, where, notwithstanding every precaution, certain descriptions of injuries will always be apt to excite phlebitis, and other forms of spreading inflammation. But when the bone is divided through the condyles, nothing more than the epiphysis being concerned, the medullary membrane is not at all disturbed, while the cancellated texture is not liable to exfoliate, either from its proneness to die from injury, or through inflammation of any other texture. It may, therefore, be expected, that the operation would prove less fatal, than when performed in the usual way ; and that the stump would be less apt to prove imperfect, through protrusion of the bone. These expectations derive encouragement from the results of amputation at the ankle-joint, to which I was led by similar considerations. Of twelve cases in my own practice, and in nearly as many more in that of other practitioners, who have been induced to adopt it, this operation has not in a single instance been followed by either death of the patient, or exfoliation of the bone ; and so far from selecting favourable cases for the purpose, I have repeatedly removed the foot, in circumstances where I should have declined amputating the leg as altogether desperate. But the two following cases more directly support the expediency of an operation which I venture to recommend, as a not less safe and advantageous substitute for amputation through the thigh bone than amputation at the ankle is now found to be for removing the leg below the knee.

[The first case was a young man, 21 years of age, admitted January 29th, 1844. The left knee had occasionally been painful for five years, and for the last twelve months had increased rapidly in size. A large abscess, pointing on each side of the ligamentum patellæ was opened, but the local uneasiness continued to increase, and the general health declined. The operation was thus performed :—]

Having applied a tourniquet, so as to compress the femoral artery where it enters the popliteal space, I made an incision across the knee on a line with the upper edge of the patellæ,—then pushed the knife from one side to the other under the joint,—cut a flap from the calf of the leg,—and finally sawed through the condyles of the thigh-bone, so as to remove the whole articulating surface, which was ulcerated and carious.

On bringing the edges of the wound together, I found the flaps were scarcely sufficiently long, as they required a little stretching to meet, and when stitched appeared more tense than is usually consistent with adhesive union. It was, therefore, with considerable surprise, and no less pleasure, that we saw the healing process proceed without retraction of the covering from the bone. The edges of the *skin* indeed separated from each other to the extent of nearly two inches, but the subjacent textures remained adherent, until the superficial sore gradually contracted and cicatrized. The recovery, though thus rendered slow, was ultimately completed, and the patient returned to his distant home on the 31st of May.

The result of this case tends to confirm the expectations that had been previously formed with regard to the advantage of amputating through the cancellated extremity instead of the shaft of the thigh-bone, since there could be no

doubt that exfoliation of the surface to any extent, however small, would have been attended with separation of the flaps and projection of the bone.

[The second case was a young woman, 22 years of age, with disease also of the left knee, of nearly three years standing. Frequent application of the moxa and other means having failed of affording relief, and the general health rapidly declining, amputation was resolved on.]

Profiting by former experience, I on this occasion made the anterior semi-lunar incision on a line with the *lower* edge of the patellæ, and had the integuments retracted before cutting into the joint above this bone. In other respects the operation was conducted as the first one had been, and when the edges of the wound were approximated, they came easily together, presenting a proper degree of fulness, without any straining or tension. The union was nearly completed by the first intention without any local or constitutional disturbance; the flaps, instead of showing any tendency to retraction, rather becoming more full and soft; and the patient presenting the aspect of one who had sustained some trivial injury, rather than undergone a capital operation. On the 14th day she was sitting by the fire, and took the dressings off without any assistance.

This case should, I think, remove any doubt that may have existed as to the safety of amputating at the knee, and consequently as to the expediency of doing so with a view to avert the danger of operating through the shaft of the thigh bone. It is upon this ground that I wish to found the operation, and therefore I have said nothing of some other advantages which might be mentioned,—such as the greater length of stump which, especially in females, must be desirable for the sake of appearance, and may, perhaps, be made available for using a support admitting of flexion at the knee,—or the facility afforded to employ the tourniquet, which causes serious embarrassment in removing the limb at any higher point.

I may remark, that the posterior flap must be made very long, and indeed to the full extent of the fleshy part of the gastrocnemii muscles,—care being taken, however, to avoid preserving more than a moderate portion in regard to thickness.—*London and Edinburgh Monthly Journal of Medical Science, May*, 1845, *p.* 537.

ON THE PATHOLOGY OF THE EAR.

By John Toynbee, Esq., F.R.S., Surgeon to St. George's and St. James's Dispensary.

[In a former paper, published by Mr. Toynbee, in the 24th vol. of the Medico-Chirurgical Transactions, (1841,) he gave descriptions of several dissections of the human ear, "as evidence of the fact that the lining membrane of the tympanic cavity is frequently in a diseased condition." In another paper, in the 26th vol. of these Transactions, he says:]

Subsequent dissections, and a careful investigation of numerous cases of deafness in living subjects, have led me to the conclusion that the most prevalent cause of deafness is chronic inflammation of the mucous membrane which lines the tympanic cavity; and that by far the greater majority of cases commonly called nervous deafness ought more properly to be attributed to this cause. This opinion derives support from an observation made to me by Mr. Swan, that in the whole course of his multiplied aural dissections he has not encountered one single instance of disease in the internal ear; an observation which embodies the result of repeated examinations to which I have myself subjected that part of the organ.

At the same time that I advance this opinion as an inference fairly deducible from more than a hundred dissections, I am far from denying the necessity of more extended researches previous to its validity being admitted.

It is worthy of observation, that though some of the persons from whom the specimens were taken, were known to have been afflicted with deafness during life, and others died of diseases which produced affections of the ear, yet the greater number, while living, were not supposed to be deaf.

This frequent occurrence of pathological conditions in the organs of persons not ordinarily esteemed to be deaf during life, loses some portion of its singularity when more closely investigated. Slight defects of hearing are so common as scarcely to excite even a passing observation, and more serious cases, from the very frequency of the disease,—perhaps the most common to which man is subject,—make but a slight impression. It may therefore be presumed that the ear is often in a pathological condition, though disease may not have proceeded so far as to produce such an extent of functional derangement as would cause serious inconvenience to the person affected, or reveal his infirmity to others.

The tympanic cavity is lined throughout by a fine membrane, forming externally the interior layer of the membrana tympani; from which it can sometimes be detached without much difficulty. In this situation it also serves as a partial investment to the chorda tympani nerve, and as a tubular sheath to the tendon of the tensor tympani muscle. Internally it covers the surface of the promontory and the membrana propria of the fenestra rotunda; passes on to the margin of the fenestra ovalis, where it is reflected on the surface of the stapes; and lastly, surrounds the tendon of the stapedius muscle, and envelopes the ossicula auditus, with their connecting ligaments.

In the healthy state, this membrane is so remarkably thin and transparent, that its presence is not easily detected. It is composed of extremely fine and delicate fibres, and in structure exhibits strong analogy to the serous membranes. Over its surface extends a layer of very minute epithelial cells: these again are covered by others, which are flat, broad, and elongated, terminating in a row of well-developed and firm ciliæ. The supply of blood-vessels is abundant; but they are so minute, and so rarely distended with blood, that, in the healthy state of the membrane, they are imperceptible. In disease, however, these vessels are very much dilated and surcharged with blood. In young persons the membrane is highly vascular, and when successfully injected, appears pervaded by plexiform ramifications.

Beneath the mucous membrane lie the ramifications of the tympanic nerve from the glosso-pharyngeal. In addition to the branches of this nerve, which have been described by Mr. Swan and Professor Arnold, I have been enabled, by the aid of the microscope, to detect numerous filaments, distributed to every part of the membranous lining of the internal wall of the tympanum; and their presence seems to offer a natural solution of the cause of the very acute pain which is experienced when there is inflammation of this structure.

In a healthy state, a small quantity only of mucus covers the surface of the tympanic membrane: the constant motion of the ciliæ, already mentioned, tends no doubt to prevent its accumulation.

Inflammation of the mucous membrane of the tympanic cavity gives rise to various pathological conditions, which it seems to me may be divided into three stages.

In the first stage the membrane retains its natural delicacy of structure, though its blood-vessels are considerably enlarged and contorted, and blood is effused into its substance, or more frequently at its attached surface. Blood has also been found between the membrane and the membrana propria of the fenestra rotunda, and in very acute cases lymph is effused over its free surface. Instances of the presence of these conditions will be found detailed in the appended account of dissections.

The second stage is characterized by a variety of very important pathological phenomena; the principal of which are the following:—

1st. A very considerable thickening of the substance of the membrane, which is often pulpy and flocculent. In this state the tympanic plexus of nerves becomes concealed; the base and crura of the stapes are frequently entirely embedded in it; while the fenestra rotunda appears only like a superficial depression in the swollen membrane. Occasionally there is a collection of mucus.

2nd. Concretions of various kinds are visible on the surface of the thickened membrane. In some cases these have the consistence of cheese, and are analogous to tuberculous matter; in others they are fibro-calcareous, and exceedingly hard.

3rd. But by far the most frequent and peculiar characteristic of this second stage of the disease, is the formation of membranous bands between various parts of the tympanic cavity. These bands are at times so numerous as to occupy nearly the entire cavity. They are found connecting the inner surface of the membrana tympani to the internal wall of the tympanum; to the stapes; and to the incus. They have also been detected between the malleus and the promontory; as well as between the incus, the walls of the tympanum, and the sheath of the tensor tympani muscle: and they so connect various parts of the circumference of the fenestra rotunda, as to form a network over the membrana propria. But the place where these adhesions are most frequently visible, is between the crura of the stapes and the adjoining walls of the tympanic cavity; this, for example, was the case in twenty-four instances out of a hundred and twenty dissections—being a fifth of the number. In one dissection, the bands of adhesion were five in number: and in other instances they were so strong, that, in removing the stapes, the mucous membrane was torn from the surface of the promontory. Sometimes, so broad and expanded have been these adhesive bands, as to have assumed the appearance of a membranous veil. They have also been known to contain blood and scrofulous matter. In some examples the surface of the promontory is rough, and in two instances the membrane attached to the base of the stapes was ossified, and the anchylosis of the latter to the fenestra ovalis was complete.

It must appear obviously impossible, that many of the remarkable phenomena which have just been pointed out can be present, without the co-existence of functional derangement, more or less serious, in the organ of hearing. The thickening of the mucous membrane, and deposition of mucus, must necessarily interfere with the course of sonorous vibrations towards the membrane of the fenestra rotunda, and hinder the free action of the stapes.

The bands of adhesion connecting the stapes with the walls of the tympanum, cannot do otherwise than impede the natural movements of the former, which has very frequently been found so firmly attached to the fenestra ovalis, as to require considerable pressure with the scalpel to disengage it. Morgagni states, that he found the cavity of the tympanum intersected by numerous membranes, which impeded the movements of the ossicula; and it appears highly probable that these bands of adhesion produce irregular movements in the ossicula. I am inclined to ascribe deafness, and many of the distressing symptoms that often accompany it, as noises like the rushing of waters, &c., to the continued pressure exerted on the contents of the labyrinth by the stapes being drawn inwards, as a consequence of the formation and subsequent contraction of the adhesions. In this opinion I have been strengthened by the examination of living persons, having frequently observed, that where the membrana tympani has been removed by disease, or where the contents of the vestibule have not received any impression through the stapes, (as in the instance of the latter bone being anchylosed,) the patients have heard better than those where satisfactory evidence existed, that the disease consisted in the thickened and adherent state of the membrane under consideration.

Another effect resulting from the pathological conditions apparent in this stage of the disease, seems to be deserving of very attentive consideration. From the interesting researches of Dr. Wollaston, and the more recent admirable and satisfactory experiments of Professor Muller on the physiology of hearing, it would appear that too high a state of tension of the membrana tympani is an obstacle to the transmission of the sonorous vibrations to the internal ear. In several of the dissections, it will be observed that the membrana tympani was bound to various parts of the tympanic cavity by firm bands of adhesion; that in others, the tendon of the muscle was surrounded by thick membrane, while occasionally both it and the substance of the tensor tympani muscle were atrophied. All these changes must most certainly exert an injurious influence upon the membrana tympani; and from them doubtless arise many of the phenomena observable in deafness.

In the third stage of inflammation of the tympanic mucous membrane, it becomes ulcerated, the membrana tympani is destroyed, and the tensor tympani muscle atrophied. The ossicula auditus are diseased, and ultimately discharged from the ear, and the disease not unfrequently communicates itself to the tympanic walls, affecting also the brain and other important organs. Of this class of diseases I am about to treat at length in a separate communication.

[In 120 dissections made by Mr. Toynbee, there were 20 ears in the first stage of inflammation of the tympanic cavity, 65 in the second stage, 6 in the third stage, and 29 in a healthy state.]—*Medico-Chirurgical Transactions, vol. 26, p. 298.*

On the Treatment of Deafness by Puncturing the Membrana Tympani.—Sir Astley Cooper wrote a memoir on this subject in the "Philosophical Transactions," and shewed that the cases likely to be relieved by the practice were those in which the Eustachian tubes were permanently closed, or when blood had been extravasated behind the membrane. To those cases other pathologists have added "a morbidly thickened and cartilaginous condition of the membrana tympani" itself. In the last number of the *Northern Journal*, we find an interesting communication on the results of the operation by Dr. Mercer. This gentleman has performed it in several cases. He gives a table, which includes fifteen. Of these, six were performed for chronic thickening of the membrane, and the remaining nine for obstruction of the Eustachian tube. One case alone, and that of the latter affection, succeeded in the restoration of hearing. The operator then agrees with Itard in saying, that "nothing is more rare than the cure of deafness by perforation of the membrana tympani." He then details at length the history of an instance of idiopathic hæmorrhage into the cavity of the tympanum. In this case, deafness, which was complete, was removed by the operation. As the example is an instructive one, we shall allow the author to describe the local appearances, the mode of operating, and the instrument:—

"The membrana tympani, instead of its normal, transparent, gray appearance, had a dull brown colour, and was slightly congested at the margin; the vertical line, indicating the handle of the malleus, was lost in the surrounding colour, and the membrane, instead of presenting its concave appearance, seemed pushed outwards into the meatus. On touching it with a probe it was almost insensible, and pressure against it produced an elastic pitting. The head was carefully supported, with the left ear turned up, and the auricle drawn towards the vertex. The speculum being introduced as far as the second curve of the meatus,

and then expanded, with a clear and steady light, the anterior and inferior part of the membrane was perforated, and a small portion of it removed by an instrument, which consists of a fine but strong steel needle, two inches and a half long, and the handle of an octagonal form, one and a half inch in length. The cutting or drill head is spear-shaped, one-sixth of an inch long, and one-eighth in breadth at the shoulders, where the edges are turned over. The point and edges are very sharp. Each of these edges is hook-shaped, one turned forwards and the other backwards; and when thus viewed longitudinally at their broadest part, they resemble the italic letter *f*. On being brought in contact with the membrana tympani, the handle is made to rotate between the thumb and fore-finger, and this being communicated to the cutting point, it perforates the membrane similar to a drill, at the same time that the averted edges are causing a considerable loss in its substance."

The subsequent treatment consisted chiefly of injections of warm water, and inflating the cavity with air, through the Eustachian tube. Dr. Mercer observed that the average time for reproduction of the membrane, when allowed to take place, was about four days.—*Lancet, Nov.* 23, 1844, *p.* 258.

CHEMISTRY, MATERIA MEDICA AND PHARMACY.

ON A NEW METHOD OF PREPARING MEDICATED TINCTURES.

By Henry Burton, M.D., Physician of St. Thomas's Hospital.

(*Continued from p.* 164.)

Remarks.—*Tinctura Aloes.*—The dissolution of good socotorine aloe, coarsely powdered, and suspended in spirit of the strength directed to be used in making the officinal tincture of aloe, proceeds uninterruptedly without agitation, and, when perfected, very little residue will remain in the bag. The resulting tincture will obtain its maximum density in forty-eight hours, and no change in its specific gravity will be occasioned by subsequently agitating the materials together in direct contact. Aloe only is thus exhausted by suspension; but if, instead of macerating aloe alone in a bag, it is macerated in a mixture with the extractum glycyrrhizæ, another component of the tinctura aloes, then the tincture will not attain its maximum density in forty-eight hours, and on opening the bag after this interval, a considerable bulk of feculent residue will be exposed, mingled with portions of the original liquorice, which cannot be entirely exhausted until the materials have been agitated together in direct contact. By subsequent agitation the specific gravity of the officinal tincture made by suspension in forty-eight hours was raised three units in the third place of decimals, or from 0·996 to 0·999. The difference, however, might be diminished by protracting the maceration by suspension a few days, and by draining the bag of solids, so as to favour the circulation of the tincture through them, once daily; but as the source of the difference is in the loss of liquorice, and not of aloe, the medicinal virtues of the preparation will not be seriously affected by it, and the deficiency of saccharine taste might be compensated for by the use of a rather larger quantity of liquorice than directed in the London Pharmacopœia of 1836. The plan suggested by Dr. Duncan, in reference to exhausting substances of different degrees of solubility used in making compound tinctures successively in spirit, does not seem to be preferable in this instance to the ordinary plan of macerating all the components together, and failed in one trial to increase the specific gravity of the tincture of aloe.

Tinctura Aloes Composita.—Rectified spirit is a very good solvent of aloe, and is used in making its compound tincture under the form of tincture of myrrha. The dissolution of coarsely powdered aloe proceeds without cessation to its completion, and requires no assistance from shaking. The resulting tincture attains its maximum density on the second or third day of suspension, and if the aloe was of good quality, and no crocus used, very little residue will remain in the bag; the tincture may be drained from the residue, for the most part, and little or no additional quantity would be obtained by subsequent compression, if prepared without crocus. In preparing the officinal compound tincture of aloe, crocus is used, but where none is used, the specific gravity is lower than that of the officinal tincture, and the hard extract yielded by a fluid drachm consisted only of the resin of myrrha and aloe.

Tinctura Balsami Tolutani.—Balsam of Tolu is very soluble in spiritus rectificatus, and its tincture is best prepared by suspension in a bag, by means of which its agglutination to the bottom of the macerating vessel, and which occurs in the ordinary process, and the necessity of filtering after maceration, are obviated. The resulting tincture was quite clear at 62°, but became turbid when cooled down below 45°: its density was precisely equal to a similar tincture made by direct contact and agitation, and only a very small quantity of residue was left in the bag, from which almost all the tincture was drained.

Tinctura Calumbæ.—Spiritus tenuior is used in a large proportion to the calumba in making its tincture, and effectually exhausts it in less than forty-eight hours by mediate contact and suspension, unaided by agitation. The resulting tincture is obtained clear, and precisely resembles a similar one made *cæteris paribus*, by agitation with direct contact, and may be, for the most part, drained from the fibro-amylaceous residue of the calumba, without incurring waste; but the expressed tincture is rather stronger than that which is drained from the bag.

Tinctura Assafœtidæ.—A large portion of the resin and oil of assafœtida is quickly dissolved by spiritus rectificatus in mediate contact, but its gummy component towards the close of the maceration forms an insoluble residue, which retards the exhaustion of the last portions of it, in the same way as the feculent residue obstructs the dissolution of the last portions of liquorice used in making the tincture of aloe. The perfect exhaustion of assafœtida by spiritus rectificatus cannot be accomplished in two or three days by either of the two processes under consideration, and in seven days the tincture made by direct contact and agitation was a little stronger than that made by mediate contact; but in equal periods of time the tincture made by the one possessed very nearly the same specific gravity as that made by the other process, and by protracting the maceration by suspension to seven days, as well as taking the precaution to drain and reimmerse the bag daily, the tinctures will be found closely to resemble one another in all respects. No difficulty attends on the packing: the bulk of the assafœtida is small in proportion to its solvent, and very little tincture adheres to the bag of residue after the final draining. The assafœtida used in my experiments was soft, and cut into small fragments; but for the purpose of favouring the circulation of the tincture through it, it should be reduced to a coarse powder in a cold mortar.

Tinctura Cascarillæ.—Spiritus tenuior quickly acts on the cascarilla suspended in it, and the resulting tincture, at the end of two days, will precisely resemble one made by the ordinary processes, *cæteris paribus*, in ten days. The bark should be reduced to a coarse powder, and, as its proportional bulk is small, it may be enclosed loosely in a bag, and will be effectually covered by the spirit. The resinous nature of cascarilla favours the circulation of the resulting tincture, and no extraordinary attention is required to ensure the success of the process. It is scarcely necessary to raise the bag until the end of the maceration, when a large proportion of the tincture may be obtained

without the aid of pressure, by draining, and quite clear.

Tinctura Cinchonæ Pallidæ.—Cinchona is rather bulky, but when used in coarse powder, it may be packed in a bag sufficiently small to admit of being effectually covered by the proportional quantity of spirit in which it is to be macerated. The resulting tincture attains its maximum density in forty-eight or seventy-two hours, and will then resemble in all its sensible qualities a similar tincture made with materials of equal goodness by direct contact and agitation in ten days. The tincture is quite clear, and about one-sixth of the original quantity of spirit is retained by the residue after draining, which, for the most part, may be expressed; and the bark loses by maceration about twenty-five per centum of its weight, consisting of water and extract soluble in spiritus tenuior.

Tinctura Conii.—This tincture is made with great ease by suspension, and attains its maximum density in two days. At the end of this time it will resemble a similar tincture made with materials of equal goodness in all its sensible qualities, and be perfectly clear. The herbaceous structure of conium is favourable to its compression within the requisite compass, and its bulk may be sufficiently reduced in a bag without rendering it impervious to the proportional quantity of spirit in which it is to be macerated. The bag should be drained once or twice during the process, and after the final draining a quantity of tincture will continue to adhere to the residue until expressed. This step may be taken immediately after the draining has ceased, and the economy of time as well as spirit which is ensured by preparing the conium in its dry state, for the subsequent expression of its tincture, strongly recommends this process in preference to the ordinary plan.

Tinctura Digitalis.—Spiritus tenuior acts very readily on, and its proportional quantity is amply sufficient to cover, digitalis under moderate pressure, suspended in it. The resulting tincture attains its maximum density in two days, and, if prepared with the mature leaf, thoroughly dried, will have a specific gravity of 0·934; but if the immature leaf is substituted, and its dessication neglected, the specific gravity of the tincture made with it will be much higher, and has sometimes reached 0·972. But the specific gravity of the best kind of this tincture never much exceeds 0·944; and when above 0·958, its medicinal virtues, according to my observation of its effects at St. Thomas's Hospital, and which were noticed in the *Medical Gazette* for June 1841, cannot be trusted. The bag process is extremely well adapted for making this tincture, and surpasses the ordinary method in most respects, but more especially as regards the economy of spirit, as well as of the attention required to conduct it.

Tinctura Guaiaci.—Guaiacum reduced to a coarse powder, or small fragments, and suspended in a bag, dissolves in spiritus rectificatus with almost the same rapidity as sugar melts in water. The resulting tincture attains its maximum density in one day or thirty hours, and the bag retains, after being drained, only a very small proportion of tincture, besides the usual impurities of the drug. Guaiacum is rather bulky compared with the proportional quantity of spirit in which it is suspended; but it is so very soluble, that the full bag may be at first suspended half above the spirit without prejudice to the process, but as soon as the contents of the lower half have given place for the most part to those of its upper half, the whole bag should be lowered into the solvent. The same remarks apply to the preparation of the officinal tinctura guaiaci composita, and in making both tinctures, the inconvenience which arises from the adhesion of the guaiacum to the bottom of the macerating vessel in the ordinary method, is obviated by the intervention of the bag.

Tinctura Hyoscyami.—Notwithstanding the bulky nature of hyoscyamus, a very moderate degree of pressure will suffice to contract its bulk within the requisite limits, and it may be effectually macerated in the proportional quantity of spirit. The resulting tincture attains its maximum density on the third day, and resembles in all respects a similar tincture macerated eight days by the ordinary process; but as a considerable portion of the tincture is retained by the hyoscyamus after draining, moderate pressure subsequently applied to the bag will be required to separate it. Its separation may be effected with little or no comparative waste of tincture; and for reasons similar to those given in reference to the tinctura lupuli, this part of the bag process far excels in its economy that of the ordinary method.

Tinctura Jalapæ.—Jalap should be macerated in the form of a coarse powder, and not be finely pulverized; it is rather bulky, but with the ordinary precautions before frequently alluded to, it may be effectually covered by the proportional quantity of spirit in which it is to be suspended. A considerable proportion of pulpy residue, intermingled with a little jalap, remains in the bag towards the close of the maceration, and, for the purpose of aiding the circulation of the solvent through it, and of exhausting the jalap, the bag should be raised once daily and drained. About one-seventh of the original quantity of spirit is retained by the bag of residue after the final draining, and the resulting tincture attains its maximum density on the third or fourth day, when it will be found to resemble in all respects a similar tincture made by the ordinary mode, with much more trouble, in fourteen days.

Tinctura Kino.—Kino is very soluble in spiritus rectificatus, and its tincture is made by the bag process with the greatest facility in twenty-four hours, at the end of which time it will have acquired its maximum specific gravity, and resemble, in all respects, a tincture made, *cæteris paribus*, by the ordinary method. A small proportion of residue, insoluble in spirit, remains in the bag, varying, however, with the kind of kino employed, but which never exists in quantity sufficient to interfere with the action of the solvent, nor to retain the tincture by adhesion, and seldom varies more than between ¼ to 7¼ per centum of kino. In the ordinary process of making this tincture, the kino, after being softened by the spirit, adheres to the bottom of the macerating vessel, and from which it is best detached by violent agitation; but this additional labour is obviated by the intervention of the bag; and simple draining only, at the termination of the maceration, will separate almost all the tincture from the residue.

(To be Continued.)

FORENSIC MEDICINE.

Dr. TAYLOR'S REPORT ON THE PROGRESS OF TOXICOLOGY.

(Continued from page 109.)

6. So large a proportion as a 4000th, probably even a consider ably larger proportion, will be insufficient, if the salts in solution be in a great measure muriates. It is right to add, that in all cases, even though the composition of the water seems to bring it within the conditions of safety now stated, a chemical examination should be made of it after it has been running for a few days through the pipes. For it is not improbable that other circumstances, besides those hitherto ascertained, may regulate the preventive influence of the neutral salts. (It may be here suggested whether organic matter in water, which has a strong tendency to combine with oxide of lead, may not have some influence.) 8. When the water is judged to be of a kind which is likely to attack lead pipes, or when it actually flows through them, impregnated with lead, a remedy may be found either in leaving the pipes full of the water, and at rest for three or four months, or by substituting temporarily for the water a weak solution of phosphate of soda, in the proportion of about a 25,000th part.

I have found that sulphate of lime, when it forms about the proportion of a 5000*th* part, also acts as a good preservative. This salt, as plaster of Paris, is easily procurable in most localities.

A few years since, Dr. Clark of Aberdeen suggested a very ingenious chemical process for depriving common water of two-thirds of its solid saline matter, thus rendering it more soft and better adapted for many purposes to which it cannot now be applied. Two-thirds of the saline matter, contained in the Thames river-water, consists of carbonate of lime held dissolved by carbonic acid; the remaining third is chiefly composed of sulphate of lime. Dr. Clark proposed to add caustic lime to water, in order to remove the free carbonic acid, and thereby to precipitate it, and the carbonate of lime held dissolved by it, entirely. The experiment perfectly succeeds when a few ounces of lime-water are added to a gallon of river-water;—any surplus lime is got rid of by exposure to air. When the precipitation has occurred, (occasionally not for some hours, or even a day,) the clear water may be poured off, and it will be found much softer. Having produced a quantity of this water, I was desirous of seeing how far, by the loss of so much saline matter, it would now be affected by contact with lead. Many experiments were performed on a small scale, and it was found that the preservative properties of the water were not at all diminished by the separation of the carbonate of lime. This seems to show that the sulphate of lime (the residuary salt) is mainly concerned in counteracting this chemical action between water and lead.

Mr. Scanlan has lately found that recently distilled water, condensed in a leaden pipe, holds dissolved a quantity of carbonate of lead, being turned brown by sulphuretted hydrogen. This is important in analysis, whether chemical or medico-legal. (Pharm. Journal, August, 1844.)

The most convenient plan, in Dr. Christison's opinion, for detecting lead in water, a duty which may occasionally fall on a general practitioner, is,—1. To examine what separates on exposure to the air, by dissolving it in warm acetic acid, and testing the solution with sulphuretted hydrogen, iodide of potassium and bichromate of potash. 2. If this process fail,—To concentrate the water to an eighth part, and again test any insoluble matter which separates; and lastly, failing this proeedure also, to evaporate the water to dryness, subject the residue along with charcoal to a red heat, act on what remains with warm diluted nitric acid, and test the solution when filtered and neutralized by an alkali. It may admit of question, whether in the event of lead being indicated in the last way only, the very minute quantity which would then be present, can prove detrimental.

We have assigned this space to one of the most valuable monographs on lead-poisoning which has appeared within the last few years. It is a subject of daily interest to the medical practitioner; and there are few cases in which chemistry has been brought to bear on medical police with more satisfactory results than in this. The cause of the mischief and the remedy are clearly pointed out. There is no doubt, that the dangerous effects produced by the contact of water with lead was well known to the Romans,—that this was the real cause of their abandoning its use, and, in the absence of iron,—resorting to those expensive structures of masonry which are now seen stretching in gigantic piles, and to enormous distances, over the Campagna di Roma. One of their leaden pipes has been found, and is now preserved in the Museum of Arles, with the name of the Roman plumber at every juncture. It is much to be regretted that there is even in our own day, among architects and builders, a degree of ignorance on this subject as great as that which existed two thousand years ago, and that notwithstanding the discoveries of modern science, serious accidents are frequently occurring in families from the want of the most simple precautions in the use of this metal.

Colica pictonum. In a paper read before the Academy of Sciences in November 1843, M. Ruolz proposed that the use of white-lead as a pigment should be abandoned, and that the white oxide of antimony should be substituted for it. Subsequently M. Rousseau suggested a process for the economical manufacture of the white oxide of antimony. It is not improbable that such a change might be attended with the benefit proposed—of extirpating colica pictonum and those disorders which affect individuals employed in white-lead works; but it is questionable how far the finely-divided oxide of antimony could be received into the system with impunity. Further, in respect to the arts, no substance has yet been found which has possessed, as a pigment, the degree of opacity which is known to belong to the carbonate of lead.

Copper. In July, 1843, a communication was made to the Academy of Sciences by MM. Danger and Flandin, on a new process for detecting copper, by the incineration of organic matter in cases of poisoning. By this means they have been enabled to detect the metal when it formed only the 100,000th part of the organic compound. (Annales d'Hygiène, t. xxx, p. 449.) The organic matter is simply dried and carbonized by heating it in a porcelain capsule, with one third of its weight of strong sulphuric acid. After being heated to dull redness, the charcoal is reduced to powder, drenched with sulphuric acid, again heated, but not to dryness, and then digested in water. By this means a clear solution is obtained, in which sulphate of copper is easily detected by the usual tests. The same process is applicable, according to the authors, to the detection of the compounds of lead, silver, bismuth, tin and gold, with the exception that, in the case of lead, muriatic, and of gold and tin, nitro-muriatic should be substituted for sulphuric acid, in acting upon the incinerated ashes. By direct analysis and physiological experiments, the authors have arrived at the conclusion, that neither lead nor copper forms any constituent part of the healthy animal body. In animals to which they had exhibited a salt of copper in divided doses, they found that the metal was not excreted with the urine, as in the case of arsenic and antimony; but with the bronchial secretion, in which they detected it by analysis. Mercury appears to take the same course in its exit from the body, since it has been found in the saliva of persons who have been taking mercurial pills. The compounds of silver and gold were observed to pass off both by the pulmonary and urinary excretions; but while the chloride of gold passed more readily by the kidneys than the lunge, it was exactly the reverse with the chloride of silver. After death from poisoning by a salt of copper, that portion of the metal which has been absorbed can be detected only in the intestines and in the liver; and about two ounces of this last-mentioned viscus were found to be sufficient for obtaining satisfactory medico-legal proof of the presence of the poison.

The question whether copper and lead constitute part of the healthy animal organs, in cases where neither of these substances can have been taken in a poisonous form, is a point which does not appear to be decidedly cleared up; although the balance of opinion is in favour of the results obtained by MM. Danger and Flandin, namely, that they neither enter into the composition of the body nor of the food of man; and that where they are said to have been detected, their presence must be ascribed to their adventitious introduction during the analysis. The question is of some interest in toxicology, for it has been already raised and thrown out as an objection to medical evidence in a late trial, already adverted to. (Ante, p. 538.)

In August, 1843, M. Barse communicated to the Academy the results of some analyses made on the bodies of two subjects taken from the hospitals of Paris. They had died from ordinary disease. M. Barse states that he detected copper and lead in both subjects. The copper was obtained in the metallic state and identified by all its characters; the lead was not obtained as a metal, but its presence was indicated by the usual tests. These metals may be detected in the liver, according to M. Barse, 1, by Orfila's process of carbonization; 2, by simple carbonization, incineration of the ash, and afterwards digesting it in nitro-muriatic acid; 3, in carbonizing by sulphuric acid and *incinerating the charcoal*, for the mere carbonizing action of sulphuric acid will not, of itself, suffice to allow of the detection of these metals.

In September, 1843, M. Rossignon of Lyons addressed a note to the Academy of Sciences on copper, as it exists in the organic tissues of many vegetables and animals. M. Rossignon states that he detected copper in all his experiments on the human body: he found it in the blood and muscular fibre of man, in the tissues of many domestic animals (the dog), and in the common vegetables used as food. The gelatin used as soup at the hospital of St. Louis yielded per cent. 0·03 of pure copper. Common sorrel gave 2 per cent. of neutral oxalate of copper; chocolate from 0·07 to 0.5 per cent. The bread generally used in Paris gave, in 1000 parts of incinerated residue, from 0·05 to 0·08 of copper (fraudulently introduced as sulphate!) Coffee, chicory, madder, and sugar yielded traces of the metal, in the latter case mixed with lead. Barley-sugar contains copper; and in the sugar of starch it forms 4 per cent. by weight, of the carbonized residue! M. Rossignon further states, that by calcining the substances in close vessels, he was enabled to detect appreciable traces of the metal

in human semen, in the excrement of the fowl, in the egg, and in the eye of the ox!

It appears difficult to reconcile these results with those obtained by MM. Danger and Flandin and others. It is intimated that the failure of these experimentalists in detecting copper was owing to their not having incinerated the carbon derived from the action of sulphuric acid on organic matter; but this does not sufficiently account for the difference, since, by pursuing the same process with the pulmonary exhalations of animals poisoned with its salts, they detected the metal readily, although here it was only found in traces. Besides, when we consider the very positive manner in which it was for a long time stated that arsenic was a normal constituent of the human body, by a higher authority than either M. Barse or M. Rossignon, and that this statement has been since entirely disproved before a committee of the Academy, we may well hesitate to assent to the assertion that copper is a natural constituent of the body. These chemical mistakes are very liable to occur in researches conducted by individuals; and it is often only by the presence of several engaged in watching the process, that the real source of fallacy is detected. *Quod volumus, facilè credimus.*

Verdigris. One case of poisoning by this substance is related in the 'Journal des Conn. Med. Chir.,' December, 1843. It is reported in the 'Edinburgh Medical and Surgical Journal' for July, 1844. A woman ætat. 28, swallowed a large dose of verdigris. She was soon afterwards seized with great anxiety, vomiting, acute pains, and swelling of the abdomen, sensation of burning heat in the throat, coldness, and severe cramp in the extremities, a labouring pulse, swelling of the face, with the eyes sparkling. An emetic brought away some half-digested food, without any traces of poison. The next morning there was painful deglutition, swelling of the throat, the abdomen tympanitic and painful on the least pressure, the countenance heavy, the face flushed, and the pulse oppressed. About two pounds of a distinctly-greenish fluid, with some blood were ejected. The symptoms became aggravated; the face and eyelids swollen and red, the eyes prominent, the abdomen flattened but sensible, the rectum so irritable and painful that enemata could not be administered. On the second day there was a tendency to coma, the face was pale, the lips swollen, the gums ulcerated, and there was an abundant discharge of viscid saliva. A copious stool was passed —the first since the poisoning; and acetate of copper was detected in it in pretty large quantity. There were several spasmodic fits. On the third day some viscid glairy matter, of a greenish colour and tinged with blood, was vomited, and the spasms continued. On the fourth day epistaxis, with general cramps came on, and the urine and fæces were suppressed. There was coldness of the surface, with convulsions. After the lapse of about a week she still had vomitings of greenish glairy matters, with uneasiness in the abdomen; but from this date she gradually recovered.

This case is interesting from the course of the symptoms being accurately noted; and it is worthy of remark, that icterus, which some have regarded as a symptom of cupreous poisoning, was at no time present. It is unfortunate that the quantity swallowed was not known.

Subchloride of copper. Among the very few cases of poisoning reported in Henke's Zeitschrift der S. A. for 1843 4, is the following. (No. 1, 1844.) A boy between two and three years of age swallowed a part of a small cake of green water-colour, such as is sold in the colour-boxes for children. Very soon afterwards he was attacked with vomiting and coldness of the extremities. Notwithstanding the exhibition of an antimonial emetic, the symptoms continued to become aggravated, and the child died. On opening the body, there was nothing to indicate specially the action of an irritant poison, except a slight congestion in the cerebral vessels. The child, it appears, had swallowed about a scruple of the green colour, which, on analysis, was proved to be the common subchloride of copper. It was remarkable that there was not the least sign of irritation or inflammation in the alimentary canal. Death was ascribed by the examiners to the exhaustion resulting from violent vomiting, and the congestion of blood in the brain thereby produced.

This case, the details of which are rather imperfectly given, shows that the subchloride of copper is a very active poison, and that it may cause death without leaving any signs of irritation in the alimentary canal. It is to be remembered that it is this compound of copper which is often formed in culinary utensils, and which thereby gives rise to accidents when any food containing salt has been prepared in the vessel without proper precautions.

Arsenite of copper. Sheele's green. The dangerous practice of using this powerful poison to give a green colour to confectionary is very prevalent, and accidents are continually arising from this cause. An instance has just been communicated to me, of recent occurrence, in which three lives have nearly been sacrificed, at a school near Manchester, owing to the parties having eaten some ornamented confectionary, which owed its green colour to arsenite of copper. They suffered from violent vomiting, severe pains in the stomach and bowels, and spasms in the extremities. Three animals which ate of the vomited matters were attacked by similar symptoms It is unfortunate that in this country there is no medical police established by law to restrict the free sale and use of this and other poisons. In this respect the English is widely distinguished from the continental practice. In France and Germany the lives of individuals are closely protected against those accidents which are liable to occur through the ignorance or criminal neglect of others. Here poison is allowed to be sold like sugar or starch; and every child is assumed by the law to be capable of protecting himself! If death ensue from such a course, we find that a coroner's inquisition and a trial for manslaughter take place, to investigate an event which, under simple medical-police regulations, would not have occurred. More than a hundred lives are yearly sacrificed in England and Wales by the unrestricted manner in which arsenic is sold. The sale of alcohol is rigorously confined by fiscal regulations; and it is impossible to say why some strong restrictions should not be placed on the sale of poisons that can seldom be required by the public for any innocent or lawful purpose. If the sale were prohibited by a penalty, except under the order of a regular medical practitioner, it is quite certain that many lives would yearly be saved, and the painful proceedings connected with these criminal trials would be spared to the country. To those who are inclined to adopt the "*argumentum ad crumenam*" it may be observed, that the law-charges incurred for such inquisitions and trials, would more than pay for the establishment of a national board of medical police.

Arsenite of copper is not the only poison which gives a green colour to confectionary. Chromate of lead, mixed with indigo has also been employed for the purpose. It has been said that there is danger in the use of these compounds for tinting paper, should the paper be subsequently used for wrapping up articles of food. The reader will find in the Annales d'Hygiène (1843, p. 358,) a full account of the composition of these mineral colours, with the police regulation adopted in France on the subject. The green and bright blue papers are condemned as the most dangerous; but, unless the colour be only roughly adherent to the surface, it is not probable that any article of food enclosed in the paper would acquire a poisonous impregnation.

Electrotyped copper utensils. Mr. Warrington has lately shown that copper vessels, saucepans, taps, and other articles, which have been covered with a surface of silver by the electrotype process, are liable to be acted on by weak acids, such as lemon-juice and vinegar, when such acids are allowed to remain in contact with them for a short time. It appears that the metallic silver with which they are covered is porous, like a sponge—a fact made evident on slight examination—and in this way the acid liquid permeates the silver, and reaches the surface of the copper. A kind of galvanic circuit is thereby established, which increases the chemical action; so that such vessels, while giving apparent security in their use, are actually rendered more dangerous. The presence of copper in acid liquids kept in the electrotyped vessels, was clearly proved by the usual tests for that metal. The same effects might occur where the liquid contained common salt dissolved.

Antimony. It would appear from the observations of the late Mr. Goodlad (Provincial Journal) of Manchester, and Mr. Noble, that tartarized antimony, even in small doses, is liable to act as a poison on the young. Mr. Wilton records four cases in which prostration and collapse followed the administration of ordinary doses of tartar-emetic to young children. Two of them were fatal. It should therefore be administered with great caution. A case, showing the importance of this remark in a medico-legal view, will be found in the Medical Gazette, vol. xvi, p. 520.

Bichromate of potash. Well-observed cases of poisoning by this compound, which is now extensively used in the arts, are rare; and, therefore, the details of the following case, communicated to the 'Medical Gazette,' (vol. xxxiii, p. 735,) by Mr. Wil-

son of Leeds, are of great practical interest. A man, ætat. 64, was found dead in his bed, twelve hours after he had gone to rest. He had been heard to snore loudly during the night, but this had occasioned no alarm to his relatives. When discovered he was lying on his left side, his lower extremities being a little drawn up to his body: his countenance was pale, placid, and composed; eyes and mouth closed, pupils dilated, no discharge from any of the outlets of the body, no marks of vomiting or diarrhœa, nor any stain upon his hands or person, or upon the bed-linen or furniture. The surface was moderately warm. Some dye-stuff, in the form of a black powder, was found in his pocket. On inspection, the brain and its membranes were healthy and natural; there was neither congestion nor effusion in any part. The thoracic viscera were equally healthy, as well as those of the abdomen, with the exception of the liver, which contained several hydatids. A pint of a turbid inky-looking fluid was found in the stomach. The mucous membrane was red and very vascular, particularly at the union of the cardiac extremity with the œsophagus; this was ascribed to the known intemperate habits of the deceased. In the absence of any obvious cause for death, poison was suspected, and on analysing the contents of the stomach, they were found to contain bichromate of potash; and the dye powder taken from the man's pocket consisted of that salt mixed with cream of tartar and sand.

(*To be Continued.*)

THE

British American Journal.

MONTREAL, OCTOBER 15, 1845.

STRICTURES ON THE MEDICAL BILL.

The detail of events of considerable importance to the Medical Profession of this Province, has compelled us to intermit, in the last two numbers of our Journal, any further allusion to the provisions of the Medical Bill, introduced in the last Session of the Provincial Parliament by the Hon. Mr. Attorney-General Smith. Having already expressed our opinion on the educational clauses for Students of Medicine, and corrected several errors which they embodied, we purpose now to pass to the consideration of those which influence the professional education of persons desirous of practising as Apothecaries, and of females as Midwives. There can be no doubt that there exists as urgent a necessity for legislation in these latter instances, as in the former; it is our duty, then, to ascertain how far the provisions of the Bill meet the necessity of these cases, and first with reference to the Apothecaries.

The 8th clause, which defines the professional education of this class, in a few words thus expresses it—"A regular and continued apprenticeship for a period of three years with some medical practitioner, or licensed druggist or apothecary," during which he shall have "attended one six months' course of lectures on Chemistry, and one on *Materia Medica*;" or "a continued apprenticeship of five years" without attendance on the aforementioned courses of lectures, to be, however, in either case, followed by an examination before one of the medical boards. Conceiving now that the office of an Apothecary involves no small degree of responsibility, and that the mere "selling of drugs and medicines" is the least important part of his duties, although it may prove to him the most profitable; that that responsibility mainly lies in the proper compounding of *formulæ*—in the possession of that knowledge which will assure him of the genuineness of the medicines which he may employ—in the ability to detect errors in *formulæ*, which might lead to disastrous results, of which, according to information, several instances might have occurred—in the proper exercise of a chemical, as well as a pharmaceutic knowledge in these, as well as a myriad of other instances, we maintain that his knowledge on these subjects should be fully adequate to meet the continual demands upon it. Will the proposed scheme of education adapted to this case by the Bill meet the emergency? We apprehend not. The amount of information to be derived from attendance on a single course of the lectures prescribed, will be, with such a minimum period of apprenticeship, too meagre to be of much value. He ought to be compelled to attend, at least, two courses of Chemistry, as an intimate acquaintance with that science is of the utmost consequence to him, and the minimum period of apprenticeship should be further extended.

But the clause further assumes, that a five years' simple apprenticeship shall be equal to a three years' apprenticeship, with attendance on the lectures specified. Here we think an error of prime importance has been committed. An apprenticeship alone will not impart that substantial knowledge of his profession, which would be acquired in attendance also on lectures; and attaching high value to lectures, in which the principles of his profession are unfolded, and his studies directed in proper channels, he should not be permitted to slight them. And the opinion to which we are now giving utterance, is also that of at least one eminent professional gentleman of this class in this city, who may be presumed to speak from an intimate knowledge of the absolute necessity of the case. If legislation in this matter is at all seriously intended, let it be done well. We would extend the apprenticeship to a minimum period of five years in all cases, with a compulsory attendance on two courses of Chemistry, and one of *Materia Medica*, of the duration specified in the Bill.

In addressing ourselves to a consideration of the 12th clause, which contains the enactment in reference to Midwives, we find ourselves met by difficulties. With very few exceptions, and these chiefly in the cities, females practising as such are generally very illiterate, and are mainly those whose poverty has driven them to this method of earning a livelihood. This, we believe, has been the case since the earliest settlement of the coun-

try ; and when we consider the enormous errors which they are continually perpetrating, and the valuable lives which are frequently sacrificed to their ignorance, the more speedily some legislative interference is taken with respect to them, the better for the community at large. But it becomes a question how far it would be politic to effect, with this class, a sudden transition through a regularly prescribed educational process, from their present low to a more improved condition, which would entail the deprivation of their services to very large tracts of country, scarcely or rarely visited by medical men, or to effect this highly to be desired end in a more gradual manner. We incline to the propriety of the latter mode, and the provisions of the clause will, we think, sufficiently answer the purpose intended. No particular course of study is directly or specially enjoined ; but after the lapse of one year, after the passing of the act, they will be compelled to submit to an examination, as to their competency, before one of the Medical Boards. The responsibility of issuing certificates of licences is thus thrown upon the Medical Boards, to whom it may safely be confided ; and it will then become their duty to grant certificates to those only who have evinced themselves qualified to undertake such trusts.

Such then are the educational clauses of the Bill ; and with the modifications which we have suggested, would sufficiently well subserve the interests of the Profession in the Province. Educated under the provisions of such an act, the Profession, in its several degrees, would quickly secure a high position, and would reflect the advantages which it possessed over the whole community.

Montreal Eye Institution.—We have much pleasure in noticing the establishment of an Institution for Diseases of the Eye in this city, under the care of Dr. Morson; Dr. Macdonnell being the consulting Physician. We have no hesitation in expressing our conviction that a specific charity of the kind is much wanted, and we doubt not its success, from the talent brought to bear upon it. An Institution of this kind, however, ought to receive in-door patients, as well as out-door, to the latter class of which its benefits are to be restricted. Doubtless, as it progresses, and its pecuniary resources become more extended, its doors will be opened to the reception of the former. With characteristic benevolence, we perceive that His Excellency the Governor-General has permitted his name to be associated with the undertaking, and we feel assured, that partaking as it will of his generosity and of his patronage, it must and will succeed.

National Convention of Physicians in the United States.—A spirit of reform appears to be pervading through, and influencing the medical profession of both Europe and America at the present moment. In Great Britain, in which the lead in this matter, appears to have been taken, a general association has been for some time formed for the purpose of watching over the interests of the Profession, and expressing a deliberative voice in such matters as appeared to affect them. In Norway, a move on the part of the government to ameliorate the Profession of that country, has been effected, and a notice of it recorded in the first number of this journal. France has not been behind in the great measure of reform ; an association for the same objects as the one in Great Britain, is now being attempted there. More lately still, we perceive the germ of a similar spirit manifesting itself in the medical community of the United States. The first step has been taken, as the following preamble and resolution, submitted by Dr. Davis to the New York State Medical Society at its late meeting, will testify :—

" Whereas, It is believed that a National Convention would be conducive to the elevation of the standard of medical education in the United States, and

" Whereas, There is no mode of accomplishing so desirable an object, without concert of action on the part of the medical societies, colleges, and institutions of all the States,—Therefore,

" Resolved, That the New York State Medical Society earnestly recommend a National Convention of delegates from medical societies and colleges in the whole Union—to convene in the city of New York, on the first Tuesday in May, in the year 1846, for the purpose of adopting some concerted action on the subject set forth in the foregoing preamble."

Establishment of an Hospital at Kingston. —We are happy to perceive that an Hospital for the reception of Medical and Surgical cases has been within the last month opened in Kingston. The position of that city at the termination of the upper lakes, and the commencement of the St. Lawrence river, should present numerous advantages in respect to the number and variety of the cases presenting themselves for admission ; and if supported in a proper spirit by the community, would prove of infinite value to the city itself, as well as the adjacent country, where such an institution is much needed. There is no institution of the kind between Toronto and this city, a distance of about 389 miles. This fact strongly speaks for the necessity of one at Kingston, which is nearly intermediate. The Hospital opens under the immediate professional charge of Dr. Hallowell and Dr. Sampson, the latter being the consulting Physician. It has our best wishes for perfect success.

RETURN OF SICK IN THE MARINE AND EMIGRANT HOSPITAL, QUEBEC, FROM THE 1st JULY, TO THE 31st AUGUST, 1845, BEING TWO MONTHS.

J. Painchaud, M.D. *Physician.*
J. Douglas, *Surgeon.*

DISEASES AND INFIRMITIES.

Febris,	99	Periostitis,	1
Variola,	7	Hydrops,	3
Herpes,	7	Hemaplegia,	2
Erysipelas,	1	Parturitio,	3
Bronchitis,	2	Syphilis,	59
Pneumonia,	8	Orchitis,	10
Phthisis,	1	Strictura Urethræ,	3
Catarrhus,	10	Fractura,	14
Pertussis,	6	Luxatio,	3
Pleuritis,	1	Subluxatio,	9
Dyspepsia,	8	Contusio,	36
Rheumatismus,	39	Vulnus,	15
Diarrhœa,	62	Abscessus,	10
Icterus,	2	Ulcus,	17
Cephalalgia,	6	Concussio Cerebri,	2
Epilepsia,	1	Ustio,	9
Cynanche (Tonsil)	3	Morbi Alien,	33
Porrigo Lupinosa,	1		
		Total,	415

NUMBER OF PATIENTS TREATED DURING THE MONTHS OF JULY AND AUGUST.

Remained,	147	Discharged,	461
Since admitted,	415	Died,	15
		Remaining,	86
Total,	562		

J. E. J. Landry, House Surgeon.

REPORT OF THE MONTREAL GENERAL HOSPITAL FOR THE MONTHS OF AUGUST AND SEPTEMBER.

DISEASES AND ACCIDENTS.

Abscessus,	5	Impetigo,	1
Ambustio,	2	Ischuria,	1
Anasarca,	1	Lupus Ferox,	1
Ascites,	2	Mania,	1
Bronchitis,	9	Menorrhagia,	1
Bursitis,	2	Morbus Cordis,	2
Cachexia,	1	" Coxarius,	1
Caries Spinalis,	1	" Ovarii,	1
Cataract,	3	Neuralgia,	1
Catarrhus Senilis,	1	Ophthalmia,	10
" Vesicæ,	1	Orchitis,	1
Chlorosis,	2	Otitis,	1
Colica Pictonum,	2	Paralysis,	1
Concussio,	2	" Agitans,	1
Coup de Soleil,	1	Pleuritis,	1
Constipatio,	2	Pleurodynia,	1
Contusio,	13	Pleuro-Pneumonia,	1
Diarrhœa,	15	Pneumonia,	5
Delirium Tremens,	12	Phthisis,	5
Dysecœa,	2	Rheumatismus,	20
Dysenteria,	1	Rupia,	1
Dyspepsia,	2	Scarlatina,	3
Eczyma,	1	Sciatica,	1
Emphysema Pulmonum,	1	Scrophula,	1
Enteritis,	1	Staphyloma,	1
Epilepsia,	1	Subluxatio,	2
Erysipelas,	2	Syphilis,	11
Febris Com. Con.,	89	Tic Doloreux,	2
" Typhus,	10	Tumor,	1
" Intermit.	2	Ulcus,	16
Fractura,	6	Variola,	1
Gonorrhœa,	2	Vermes,	1
Hemorrhoids,	2	Vulnus,	1
Hypertrophia Mammæ,	1	Ulceration of Cartilages,	1
Hypochondriasis,	1		
Icterus,	6	Total,	306

Dr. Bruneau, Dr. Hall, } Attending Medical Officers for August.

Dr. Crawford, Dr. Sewell, } Attending Medical Officers for September.

NUMBER OF PATIENTS TREATED DURING THE MONTHS OF JULY AND AUGUST.

Remained,	94	Discharged, Cured,	287
Admitted,	306	Died,	12
		Remaining,	101
Total treated,	400	Total,	400

IN-DOOR PATIENTS TREATED.		OUT-DOOR PATIENTS TREATED.	
Belonging to Montreal,	182	Belonging to Montreal,	419
Immigrants,	111	Immigrants,	87
Seamen,	13	Seamen,	8
Total,	306	Total,	514
Males,	187	Males,	244
Females,	119	Females,	270
Total,	306	Total,	514

Alexander Long, M. D., *House Surgeon.*

BOOKS, &c., RECEIVED DURING THE MONTH.

American Journal of Insanity. Vol. ii., No. 1 and 2. July and October (Utica).

Boston Medical and Surgical Journal. Nos. 7, 8, 9, 10.

St. Louis Medical and Surgical Journal. September No.

Dublin Medical Press. From July 2nd to Sept. 17th.

Wiley & Putnam's Literary News Letter. October, 1845.

Buffalo Medical Journal. October, 1845.

Illinois Medical and Surgical Journal. Chicago, Sept.

American Journal and Library of Dental Science. September (Baltimore) 1845.

Southern Medical and Surgical Journal. October, (Augusta, Ga.)

NOTICE TO CORRESPONDENTS.

Letters have been received during the month, with enclosures, from Dr. Gilmour, (Three Rivers,) J. J. Sims, Esq., (Quebec,) Dr. Layton, (Toronto,) Dr. Painchaud, (Quebec,) Dr. Evatt, (Port Hope,) Dr. Blakeney, (Royal Canadian Rifle Regiment, Chippewa,) Dr. O'Reilly, (Hamilton,) *and* Dr. Grant, (West Williamsburgh; *the wishes of* Dr. Millar, (Amherstburgh), *and* Dr. P. V. De Boucherville, (St. George d'Henryville,) *have been complied with.*

The Journal has been forwarded to Dr. G. Dunham, (Brockville), *and* Charles Leviscourt, Esq., (Belleville,) *in accordance with instructions.*

We have to acknowledge the receipt of a letter from Dr. Rae, *of* Hamilton. *The matter alluded to by* Dr. R. *had escaped notice. It will receive early attention. The Editor regarded it as private. We are exceedingly indebted to* Dr. Grasset, (Toronto,) *for his kindness in the furtherance of our wishes, as conveyed to us in a letter received yesterday.* Mr. Lefroy, *the superintending officer at the Observatory, Toronto, will please accept our thanks for his ready acquiescence in our desire. We would suggest that a similar form to that employed in the Montreal Report be made use of, thus permitting of ready comparison, and that the hours of observation be the same. If* Mr. Lefroy *should entertain a different opinion, we at once yield. Shall we expect a Meteorological Report for the present month (October), to be inserted in the succeeding number? If* mailed *on the 4th or 5th of the months, the Reports would reach us in time sufficient for publication.* Dr. Taylor's *letter* (Ristigouche,) *has just arrived. Before this number of the Journal reaches him, he will have found his wishes fulfilled, and we hope satisfactorily.*

In answer to Dr. Dowler's *letter,* (New Orleans,) *we have to reply, that his pamphlet is under consideration, and notice will be taken of it in an early number.*

MONTHLY METEOROLOGICAL REGISTER AT MONTREAL—August, 1845.

Date.	Thermometer.				Barometer.				Winds.			Weather.		
	7 A.M.	3 P.M.	10 P.M.	Mean.	7 A.M.	3 P.M.	10 P.M.	Mean	7 A.M.	Noon.	6 P.M.	7 A.M.	3 P.M.	10 P.M.
1,	+62	+77	+64	69.5	30.10	30.11	30.13	30.11	W.N.W.	W. by N.	W. by N.	Fair	Fair	Fair
2,	" 65	" 77	" 63	71	30.18	30.17	30.16	30.17	W. by S.	W. S. W.	S.W.byW	Fair	Fair	Fair
3,	" 62	" 79	" 67	70.5	30.10	30 14	30.12	30.12	S. W.	S. W.	W.	Fair	Fair	Rain
4,	" 66	" 80	" 66	73.	30.05	30.03	30.05	30.06	W. by N.	W. by S.	W. by S.	Rain	Sh'wrs	Fair
5,	" 63	" 81	" 68	72	30.05	30.05	30.06	30.05	W.	W. by S.	S. W.	Fair	Fair	Fair
6,	" 66	" 89	" 76	77.5	30.06	30.03	29.97	30 02	S. W.by S.	S. W.	S. W.	Fair	Fair	Fair
7,	" 74	" 90	" 75	82	30.00	30.00	29.99	30 0	S. W.	S. W.	S. W.	Fair	Fair	Fair
8,	" 75	" 89	" 74	82	29.99	29.98	29.98	29.98	S. W.	S. W.	S. W.	Fair	Fair	Fair
9,	" 76	" 90	" 77	83	30.02	30.00	29.96	29.99	S. W.	S. W.	S. W.	Fair	Fair	Fair
10,	" 74	" 92	" 78	83	29.89	29.78	29.70	29.79	S. W.	S. W.	S. W.	Fair	Fair	Fair
11,	" 74	" 88	" 70	81	29.66	29.64	29.66	29.65	S. W.	S. W.	N. by W.	Rain	Rain	Rain
12,	" 63	" 89	" 66	76	29.75	29.81	29 85	29.80	N.W.byW	N.W.byW	N.W.byW	Fair	Fair	Fair
13,	" 64	" 80	" 70	72	29.92	29.91	29.90	29.91	N.W.byW	W.	W.	Fair	Fair	Rain
14,	" 65	" 79	" 63	72	29.97	29 99	30.10	29.93	W.	W.	W.	Fair	Fair	Fair
15,	" 61	" 80	" 65	70.5	30.17	30 13	30.10	30 13	W.	W.	W.	Fair	Fair	Fair
16,	" 66	" 82	" 72	74	30.09	30.09	30.10	30.0	W.	W.	W.	Fair	Fair	Fair
17,	" 67	" 87	" 71	77	30.16	30.13	30.03	30 11	N. W.	N. W.	N. W.	Fair	Fair	Fair
18,	" 75	" 82	" 73	78.5	29.97	29.97	29 96	29.97	S. W.	S. W.	S.W.by S.	Fair	Fair	Fair
19,	" 65	" 80	" 69	72.5	30.10	30 10	30 08	30.09	N. W.	N. W.	N. W.	Fair	Fair	Fair
20,	" 64	" 90	" 75	77	30.10	30 05	29.98	30.04	N. W.	S. W.	S. W.	Fair	Fair	Fair
21,	" 73	" 90	" 70	81 5	29.97	29.76	29.92	29.88	N. W.	S. W.	S. W.	Fair	Fair	T.& R.
22,	" 71	" 82	" 71	76.5	30.04	30 01	30.03	30 01	N.E. by E.	N. E.	N. N. E.	Rain	Fair	Fair
23,	" 67	" 82	" 75	74.5	30.01	29.98	29 96	29.98	N.E.	N. W.	N. W.	Fair	Fair	Fair
24,	" 65	" 82	" 67	73.5	30.10	30.07	30.02	30.06	N. W.	N. W.	N. W.	Fair	Fair	Fair
25,	" 63	" 83	" 69	73	30.08	30.01	29.94	30.01	N. W.	N. W.	N. W.	Fair	Fair	Fair
26,	" 62	" 79	" 65	70.5	30.00	30.00	30.02	30.01	N. W.	N. W.	N. W.	Fair	Fair	Fair
27,	" 54	" 68	" 60	61	30.02	30.03	30 97	30 01	N.W.byN.	N.W.byN.	N.W.byN.	Rain	Fair	Fair
28,	" 50	" 78	" 65	64	30.30	30.30	30.30	30.30	N. W.	N. W.	N. W.	Fair	Fair	Fair
29,	" 65	" 75	" 66	70	30.20	30 11	29.94	30.08	S. W.	S.	S.	Fair	Fair	Fair
30.	" 58	" 74	" 59	64	29.86	29.86	29.86	29.86	S. by W.	S. W.	S. W.	Rain	Fair	Fair
31,	" 56	" 73	" 53	64.5	29.98	29.96	30 00	29.98	N.W.byW	N. W.	W. N. W.	Fair	Fair	Fair

Therm. { Max. Temp., 90° on the 9th and 21st
Min. " 50° " 23th
Mean of the Month, 73° 8'

Barometer, { Maximum, 30 30 Inches on the 28th.
Minimum, 29.64 " " 11th.
Mean of Month, 30.01 Inches.

MONTHLY METEOROLOGICAL REGISTER AT MONTREAL.—September, 1845.

Date.	Thermometer.				Barometer.				Winds.			Weather.		
	7 A.M.	3 P.M.	10 P.M.	Mean	7 A.M.	3 P.M.	10 P.M.	Mean	7 A. M.	Noon.	6 P. M.	7 A.M.	3 P.M.	10 P.M.
1,	+53	+67	+58	60	30.00	29 94	29.87	29.955	N.W.byW	N.W.byW	N. W.	Fair	Fair	Fair
2,	" 52	" 64	" 57	57	29 70	29.65	29.56	29.655	N.W.byN.	N. W.byN	N.W.byN	Rain	Rain	Rain
3,	" 53	" 75	" 63	67 5	29.84	29.58	29 66	29.58	N.W.byN.	W. N. W.	W.	Cloudy	Fair	Fair
4,	" 61	" 71	" 56	66	29.60	29.61	29 64	29 62	W.	W.	W.	Fair	Sh'wrs	Fair
5,	" 57	" 69	" 59	63	29.74	29 78	29.77	29.76	N. W.	N.W.byW	N.W.	Fair	Fair	Cloudy
6,	" 56	" 67	" 57	61.5	29.90	29.91	29 94	29.92	N.W.byW	N.W.byW	N.W.byW	Fair	Fair	Fair
7,	" 56	" 65	" 50	60 5	29.30	29.20	29 70	29.40	S. W.	W.	W.	Rain	T. & R.	Cloudy
8,	" 44	" 66	" 49	55	29.99	30 03	30.07	30.03	N.W.byN.	N.W byN.	N.W.byN	Fair	Fair	Fair
9,	" 48	" 58	" 50	53	29.98	29.89	29.77	29.88	S. by W.	S.	S.	Fair	Rain	T.& R.
10,	" 54	" 65	" 50	59	29.80	29 85	29 93	29.86	W. by S.	W.	W.	Fair	Sh'wrs	Fair
11,	" 50	" 65	" 45	57 5	30.06	30.13	30.18	30.12	W.	W.	W.	Fair	Sh'wrs	Fair
12,	" 42	" 64	" 48	53	30 30	30.33	30.32	30.32	W.	W.	W.	Fair	Fair	Fair
13,	" 38	" 66	" 55	52	30 36	30 21	30.02	30 31	S.W. by S.	S.W. by S.	S. S. W.	Fair	Fair	Rain
14,	" 46	" 61	" 56	53 5	29 68	29.62	29.66	29.65	S.	S.	W.	Rain	Rain	Rain
15,	" 55	" 67	" 50	61	29.66	29 74	29.81	29.73	W.	W.	W.	Cloudy	Sh'wrs	Fair
16,	" 43	" 62	" 49	52.5	30.00	30.04	30 10	30.05	W. N. W.	W. N. W.	W. N. W	Fair	Fair	Rain
17,	" 48	" 65	" 55	56.5	30.17	30 05	29.84	30.03	W. N. W.	W. N. W.	W. N. W.	Fair	Fair	T.& R.
18,	" 57	" 70	" 57	63.5	29.71	29.76	29.75	29.75	W. N. W.	W. S. W.	W. S. W.	Rain	Cloudy	Sh'wrs
19,	" 49	" 65	" 52	57	29.89	29.89	29.88	29.89	N. W.	N. W.	N.W.	Rain	Fair	Fair
20,	" 53	" 64	" 59	58.5	29.80	29.68	29.50	29.66	N. W.	S. W.	S.W.by S	Fair	Rain	Rain
21,	" 51	" 60	" 44	55.5	29.66	29.66	29.74	29.69	W.	W.	W.	Fair	Fair	Fair
22,	" 40	" 58	" 43	49	30.00	30 03	30.07	30.03	W. N. W.	W. N. W.	N.W.byW	Fair	Fair	Fair
23,	" 39	" 55	" 48	47	30 12	30.07	29.95	30.05	N.W.byW	W. by S.	W. by S.	Fair	Fair	Rain
24,	" 45	" 57	" 47	51	29.94	29 95	29.95	29.95	N. W.	N. W.	N. W.	Fair	Sh'wrs	Cloudy
25,	" 46	" 62	" 47	54	29.96	29.94	29.96	29.95	N. W.	W. N. W.	W. N. W.	Fair	Sh'wrs	Fair
26,	" 47	" 60	" 50	53.5	30 00	29.98	30.00	29.99	W. N. W.	W. N. W.	W. N. W.	Sh'wrs	Rain	Rain
27,	" 46	" 62	" 56	54	30.17	30.18	30.19	30.18	W. N. W.	W.	W.	Fair	Fair	Fair
28,	" 49	" 69	" 61	59	30 20	30.10	30.08	30 13	S. W.	S. W.	S. W.	Fair	Fair	Fair
29,	" 58	" 72	" 62	65	30.07	30.03	30 00	30.03	S. W.	S. W.	S. W.	Rain	Fair	Cloudy
30,	" 56	" 71	" 55	63.5	29.95	29.88	29 76	29.86	S. W.	S.W. by S.	S.	Fair	Rain	Rain

Therm. { Max. Temp. 75° on the 3rd,
Min. " 38° " 13th
Mean of the Month, 57° 3'

Barometer, { Maximum, 30.36 Inches on the 13th.
Minimum, 29.20 " " 7th.
Mean of Month, 29.90 Inches.