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**SANITARY JOURNAL**

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**CONTENTS.**

Disposal of Sewage by irrigation—Sewage farming in France, England, Germany and elsewhere .....	1	Marsh and water supply—Diphtheria in Canada—Koch's Bacilli—Partly digested foods—Sickness rates—Vaccination and Rabies—Interesting Exhibition—Increase of Insanity—Refuse Destructor—New Ambulance—Milk-typhoid—Warning to Landlords—Diphtheria in Cats—Heap's Patent Earth Closets and other items..	15 to 23
Brain of the school child—a new point..	5	Miscellaneous—Baking powder—Wilful waste, &c .....	23 to 24
Disinfection .....	8	Publisher's Notices .....	24
Story of Lieut. Greely's recovery .....	8	Literary and Scientific.....	25
Sunlight in stables.....	9		
Sanitary Reform—Baldness .....	10		
Value of water drinking—Abuses in Asylums .....	12		
The work of Med. Health Officers.....	13		
Over-pressure in schools.....	14		
Matters Recent and Current—Sanitation in Toronto—The trunk sewer, Don			

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No. 1.

DISPOSAL OF SEWAGE BY IRRIGATION—  
SEWAGE FARMING IN FRANCE, GERMANY,  
ENGLAND AND ELSEWHERE.

If future generations of Canadians are to enjoy a fair degree of health, and the beautiful farms in this Country are to continue to be fairly productive, it is absolutely essential that some other and better method shall be generally adopted, and that soon, for the disposal of the Sewage of our cities and towns. No question affecting this Dominion is perhaps of greater importance than this one of Sewage disposal. Following are some extracts upon this subject from an exhaustive paper read not long ago at the Suffolk District Medical Society, Mass., U. S., by H. J. Barnes M. D.;—from the Sanitarian:—

After long and costly experiments the greatest chemists have declared that in practice the only manner to epurate sewage is to send it on the land, which eliminates the polluting elements and fertilizing matter for the good of vegetation and the soil. Dr. Angus Smith says: "In all cases the best results are obtained by irrigation." And Dr. Carpenter certifies in a notice read at the International Congress in 1881, "the only way ammonia can be eliminated from sewage is by irrigation."

A commission appointed by Parliament in England, composed of Messrs. Denison, Frankland, and Morton, reported: "The actual resources of chemistry do not permit the hope that the polluting matter dissolved in sewage can be precipitated and sent away by any appliance

of chemical reaction, and unless new chemical laws are discovered it is useless to attempt the employment of chemical agents. Epuration must be confided to Dame Nature." Millions of dollars have been expended in France in chemical experiments on sewage, all of which have been condemned.

The city of Paris, for many years harassed by constant complaint and litigation as a result of discharging sewage into the Seine, some years since established sewage farms on the plains of Gennevilliers, the history of which is told in a report to the municipal council by the sixth commission appointed to treat with the State for the concession of such public lands at Achères as are necessary for the epuration of the sewage by irrigation and agriculture.

Experiments were made which, after fifteen years of study and persevering effort, have given a result most complete and satisfactory. Epuration and utilization by agriculture and filtration by spreading the sewage on permeable land have accomplished this end. It is based on simple principles, of which the demonstration is now made. All argillo-silicious and permeable soils sufficiently thick and well drained have the property of retaining in their superior layers all the organic matter in suspension and solution contained in drain-water spread on the surface of the land. It can receive without being made damp or marshy, one inch of water per day, or twenty-six feet per year. It transforms the retained organic matter, rendering it capable of

assimilation by plants. A very ingenious experiment just made shows this valuable property in the vegetable mould. A hollow column two metres in height was filled with earth in a manner to reproduce exactly the soil as found at Gennevilliers. Through this was passed sewage in a relative quantity to that employed in irrigation and at equal intervals with its use on the land. Eputation took place as completely as in the natural earth. Chloroform was then passed through the column, which at once arrested eputation, and the sewage traversed the column without being purified. Paralyzation of the infusoria stopped oxidation of the organic matter. This experiment has been demonstrated by M. Schloessing, and is described in the report to the Council of Hygiene. If the Surface irrigated is under cultivation the fertilizing matter is immediately utilized; if not, it accumulates without loss and transforms the poorest soil into land of extreme fertility.

A very large proportion of the water used in irrigation is evaporated either directly or by the plant in vegetation. The residuary water coming from the subsoil drains is of a remarkable purity, and does not suggest, either by aspect or composition, the sewage from which it proceeds. Irrigation is the most economical and efficacious means of conveying directly to the plants the fertilizing matter of sewage.

Trusting in these principles, and fortified by the works of Messrs. De Freycinet, Schloessing, Marie-Davy, and Frankland, the engineers of the municipal service have, since 1867, pursued studies and made experiments for which, notably since 1872, the council has furnished a large amount of money. These efforts have had as a result the great and actual demonstration at Gennevilliers, which evidence impresses favorably all unprejudiced persons who take the trouble to visit the lands.

After some experimental cultivation at

Clichy in 1867 and 1868, the irrigation of the plains of Gennevilliers was begun in 1869 by Messrs. Mille and Durand-Claye. In 1870 and 1872 the territory comprised but a few hectares. It has increased each year, until now over 400 hectares are thus employed (about 1,200 acres, which receive nearly one-fourth the sewage of the city). In the beginning the water distributed was limited to a few thousand cubic metres. In 1872, 444,900,000 gallons were used. In 1881, 4,685,000,000 gallons were discharged on the land. In May of this year (1881) 684,300,000 gallons—22,050,000 gallons per day, or 44,100 gallons per hectare per day—these plains absorbed. In 1882, at the time of the report, the distribution reached 34,020,000 gallons per day, or 79,300 gallons per hectare, which represents a sheet of water spread over the surface equal to a little over one inch per day.

The progress, the slowness of which astonishes us now, has not been obtained without difficulty. At the origin, the engineers, relying too much on the very great permeability of the land, had not thought it necessary to establish subsoil drainage. The natural drainage, in consequence of an abundant irrigation was found insufficient. The level of the subsoil water rose; a few cellars were flooded at Gennevilliers, and gravel quarries were inundated. The necessary work to insure the drainage of the plains and to remove all pretext for damages was done, and to-day the complaint is rather of the lowering of the subsoil water. Irrigation at Gennevilliers created a prosperity until then unknown and a time arrived when the community, frightened by the possible result of its demands and outcries—which threatened to be the suppression of irrigation—asked for a contract, the principal article of which was that the city should engage to continue irrigation on the plains of Gennevilliers for twelve years.

The efficacy of this system of eputation is manifest, and presents a brilliant proof

The effluent drain-water has fewer micro-organisms than the water of the Seine when it enters Paris. It has the purity of spring-water coming from the earth. To demonstrate the utility of the system as applied to agriculture has been slow and difficult, and not less laborious than the efficacy of epuration. For the latter the analyses made by the savants were proof beyond dispute, for the former the concurrence of the humblest practitioner; and it required time, much time.

The slowness of experiments in agriculture may be understood when we remember that to reach an end we must go through all the phases of vegetation, from the sowing of the seed to the harvest. To-day our cultivators are in complete possession of their art, and in the recent horticultural exhibition every one admired the remarkable products which received honorable distinctions.

In agriculture, successes which would be shown by beautiful samples obtained in the fields of experiment would be objects of curiosity. It is necessary to secure economical results, and these go far beyond the utmost expectations. For the landlord of the soil the rent value of the hectare has increased five-fold—from 90 to 450 francs. For the farmer or cultivator the prosperity has not been less. The net value of vegetable products rose from little or nothing to 4,000 francs per hectare.

In a sanitary point of view, the results have not been less satisfactory, and here again it is necessary to observe the facts on the ground. One sees a numerous population, robust and healthy in proportion to its prosperity. Its vigor assures a healthy nutrition equivalent to its works, which is the best hygiene.

As to the effects of irrigation, the same occurs at Gennevilliers which always takes place where irrigation is practised: from the moment it is made frequent, without stagnation, and at regular intervals, a condition which is far from favorable for the development of paludal

influences. The determining causes are eliminated; a constant activity is maintained in the vegetable life, which absorbs in its circulation all its own residues and all the organic elements placed within reach.

Highly to the honor of the city of Paris be it said that, by the perseverance of its representatives, by the science and devotion of its engineers, the problem of epuration of the residues of cities and of their utilization by agriculture is absolutely and definitely solved. We have no longer the experiment of Gennevilliers; we have a system permanent and regular for the future.

The population of Gennevilliers has increased by farmers coming to occupy the lands, thirty-four per cent. in ten years. Among the city documents of Paris lately presented to the city of Boston, and placed in the Public Library, may be seen photographs of the departments of this branch of the municipal service as well as of the products of the land. The commission, in recommending the acceptance by the city of the terms which the state proposes for the extension of the work so as to include the sewage of the entire city, recommends a municipal ordinance which shall require all the water-closets in the city to be connected with the drains, and an absolute abandonment of cesspools, which now are so common in Paris. Up to the present time the city has declined to accede to the terms of the State, as they are deemed too exacting and require a very large amount of money for the purchase of the land. The success of epuration by this method is not questioned. The work of Babut du Maris, lately published, says "the city has just obtained 2,500 acres for the extension of the sewage farm."

During the past ten years sanitarians and engineers have made great progress toward a solution of this question of the utilization and purification of sewage, and it is fair to presume, from the great increase in the number of cities and towns

that have adopted irrigation and agriculture as the means of purifying sewage, that this method has proved the most satisfactory.

Berlin has two large farms devoted to this object, one of 2,035 acres and another of 1,818 acres. A great many chemical experiments were tried before the adoption of the present system. They proved very expensive, and none purified the water, although many clarified it. Finally, after experimenting in irrigation and agriculture for eighteen months on a little field of about three hectares (less than seven and one-half acres), such favorable results were realized that this system was adopted for the city, the eminent Virchow working heartily in its favor. At the present time 1,067 acres suffice to purify 15,060,000 gallons per day, the drainage of four-fifths of the city, containing a population of over 600,000. There is some odor at the opening of the large sewer, but in the fields there is no smell, and the sanitary condition is all that could be desired. There never has been any complaint from the numerous adjoining habitations, and the effluent drain-water of the farms is pure and clear, it being impossible to recognize by microscopy or chemistry any influences of the sewage. Vegetables and fruit trees grow luxuriantly on the land, and their roots make a perfect filter. Thirteen and one quarter tons of hay have been cut per hectare.

Dantzic, situated about three miles from the Baltic, on account of pollution of its harbor at the mouth of the Vistula, constructed a sewer to discharge on a sandy island having little or no soil, where the occasional tufts of grass were frequently covered with sand carried by the wind. As a result, the island is now in a high state of cultivation. In some parts the land rents to peasants at from twenty to thirty dollars per acre. The frosts of winter do not interfere with the successful operation, as the water delivered by the sewer melts the snow and ice, so that it finds its way into the ground quite as well as in summer, and without injury to the slumbering vegetation. Odessa, Breslau, and Florence also have sewage farms. M. A. Durand-Claye,

from whose reports this information is derived, says that "in Germany it is admitted without question that municipal healthfulness depends upon three principles: first, the total discharge of water-closets in sewers; second, the distribution of an abundant supply of water in dwellings and frequent flushing of drains; third, the purification of sewage by soil and vegetation."

In England there are two hundred cities and towns disposing of sewage by irrigation and agriculture. On the farms at Edinburgh are located beautiful nurseries for the children of the city. At Lochend, a farm taking sewage from this city has produced \$200 worth of hay per acre. The Metropolitan Sewer Company of London rents land at \$100 per acre for grazing. Sixteen acres at Rugby furnish feed for fifty-four head of cattle, and at Aldershot, Branbury, Bedford, Croydon, Norwood, Warwick, and Worthing, the reports in detail show an equally wonderful production from the land treated in this manner.

Leamington, with 26,000 inhabitants, spent \$40,000 in chemical experiments, after which the A, B, C Company, in 1869, attempted to purify the sewage, but gave it up in 1871. It was then allowed to flow into the river Leam. A lawsuit followed, costing the city \$25,000, in which it was defeated, and compelled, at an expense of \$7,500, more, to purify the river. Lord Warwick then consented to receive the sewage on his estates, the city contracting to deliver it at the highest point of the farm for a period of thirty-two years, for which Lord Warwick engages to pay \$2,250 annually. The sewage amounts to a little over 1,000,000 gallons per day, and is distributed over the land, which has not been levelled, by what is known as the "donkey back" system—elevated open drains, on the sides of which is the vegetation. It has transformed the poorest parts of the farm into soil of much fertility, and financially has proved a great success. From eight to nine cuts of Italian rye grass two feet high are made each year. Celery, strawberries, and currants grow remarkably well. The beef, milk, and butter is in great demand, and bring the highest prices. The laborers are in the best of health, and Lord Warwick has received numerous prizes and silver cups

for one of the best-kept farms in the kingdom. A more detailed account may be found in Babut du Maris' work.

The sewage farm at Croydon is surrounded by beautiful villas, it being a fashionable resort. The land, which twenty years ago sold for about three hundred dollars per acre, is now worth from \$2,000 to \$5,000. There has been but one complaint of the farm during the past twelve years, and this resulted from excessive irrigation during a long period of stormy weather, when the hay could not be dried on the land. A public footpath crosses the sewage farm at Abingdon. There has been no complaint from bad odor.

A few of the farmers living along the Blackstone River, Mass., are beginning to appreciate the valuable fertilizing material conveyed by the current from Worcester. One farmer states that his meadow lands, which were practically abandoned, it not paying to harvest the grass, now produced crops which add several hundred dollars a year to the value of his farm. Others are placing obstructions in the river, with the objects of turning the water on the land.

Babut du Maris says: "It has been claimed that prolonged irrigation will produce disease by the presence of bacteria in the sewage. Experience is to the contrary. The farms at Edinburgh have received the sewage for over two centuries, that at Buntzlau for two and a half centuries, and for more than ten centuries it has been in practice in China. Vegetation has never ceased to be vigorous and healthy, and the inhabitants have never been known to suffer in consequence of irrigation.

The highly satisfactory operation of this system at Dantzic, where the rigorous climate of winter is as great an obstacle to overcome as in Massachusetts, is sufficient proof that frost is not an objection to its employment on our soil. The land freezes four feet deep at Dantzic. The Vistula is frozen over from the middle of November to March, yet the temperature of the sewage at the mouth of the sewer never goes below 37 F. Irrigation is continued throughout the year with quite as much success in evaporation in winter as in summer, although vegetation flourishes but four out of the twelve months.

#### THE BRAIN OF THE SCHOOL-CHILD.— A POINT IN EDUCATION NOT USUALLY CONSIDERED.

The following is an interesting and suggestive paper by Francis Warner, M. D., F. R. C. P. Assistant Physician to the London Hospital, read at the meeting of the Social Science Congress at Birmingham, September 19th, 1884.

Public education is presumably undertaken for two purposes, (1) the benefit of the child, (2) the benefit of the public. From both points of view it is very desirable that all the mental and moral faculties of the child should be cultivated. Inasmuch as the properties of mind depend to a very great extent upon the condition of the brain, it is highly desirable that the educationalist should have some knowledge as to what kind of a brain he has to educate, and that he should know something of its various properties and functions, not only its intellectual manifestations; such knowledge may enable him to preserve the balance of the powers of the brain as it develops.

It will be granted that the educational processes should be adapted to the children, and it must be admitted that the average educational processes must be adapted to the average child. Are the average methods of education adapted to all children? A while ago it was found out that the deaf and the blind could not be taught in ordinary school-rooms; these are now in part provided for by small special classes. I desire to draw attention to another class—the nervous, irritable children; children who are irregular in attendance on account of headaches, recurrent chorea, occasional fits; habitual truants whose brain defect can be proven; the child so dull that it remains among the infants and learns nothing. As a hospital physician I meet with many such children, though doubtless they are but a small percentage of the school population, and from what I see I think those are practically not educated.

Is this to the public advantage? Why are the deaf and the blind educated? A part of the reason is that they may not become paupers. Why are the children of slight brain defect uneducated—children tending to become passionate, to pick up bad habits and practice them, tending to criminality, or, if too feeble for that, to pauperism? They are not neglected intentionally, but because they are not known to the school managers, it is nobody's business to find them out; they are not classified, and take their chance with the rest. Now my argument is, we can discover such children, and pick them out by definite physical signs; we can pick out from a class the child not up to the average, the child tending to failure from want of brain-power.

To say that such children are few in every school is no reason for their neglect; we rejoice that but few have such inborn conditions as make them tend to social failure, pauperism, or crime. but we wish that none should thus fail. Let such tendencies be detected early, and pointed out to the educationalist, that he may tend such cases carefully, helping to correct the defects due to brain condition.

I do not propose here to describe the physiology and pathology of the child's brain, but I think that some such knowledge should be acquired by those responsible for large schools. Having looked carefully through the books now being exhibited at the Health Exhibition, and having made enquiries of all the school publishing societies, I find works on physiology, but none on the study of the brain of the child. In the exhibition only one exhibit contains a health register, and that comes from Japan. The brain of the schoolchild should be undergoing rapid development; the school-managers cannot be responsible for its nutrition as far as that is dependent upon food, but they may in special cases regulate the teaching according to the brain condition.

Let it be known and remembered that every movement and every posture of the

body is an index of the action of the nerve mechanism. Let the teacher and manager study the children, the way they stand, the manner in which they hold out their hands, the appearance of their faces; let them study the expression of each child's condition.

Particularly should observation be directed to note any bodily defect about ears, eyes, lips, &c., for when there is a visible defect, if only in an ear, the brain is often coincidentally defective in its development.

In various published essays I have given these signs in detail, so refrain from giving them here. I believe that roughly speaking, a layman may be taught the physical signs of brain conditions with sufficient accuracy to guess, with some degree of certainty, the children with slight brain defect, recurrent headaches, those who sleep badly, and are excitable; such teaching our profession can give to teachers.

Neglect in these matters does lead to unintentional cruelty to children, and to what I think more important, to the educational neglect of wrong-brained children. The teachers do not want to neglect them; such neglect is due to ignorance, for which the managers are responsible. Now, as to these wrong-brained children, they are worth helping; in most cases a genius is abnormal; the very faults and nervousness may be trained to become admirable qualities—sensitiveness of mind, mobility of mind; and the fidgety child may become an active man. Such children too often escape from an educational process unsuited to them, but still, better than no education. The nervous, excitable boy, always ill with sick headaches while at school, is excused from school attendance; at home he is idle; too often the parents are neglectful and unwise; and as he grows up, when drink or passion inflame him, he commits some act bringing him within the power of the police. I have seen the education of many such continued with

success when removed from large schools, and placed at inferior, but small and quiet schools. Again, the weak-brained, feeble-minded child often gets so teased, that at last he cannot be induced to go to school; his attendance is excused on the ground of health. What becomes of him after that?

Two important questions arise, than: (A) How can wrong-brained children be picked out? (B) What can be done for them?

A. How can the wrong-brained be picked out?

This raises the question whether the ordinary school manager is able, unassisted, to discover the brain condition of the children. Should there be an occasional medical inspection to aid the managers to determine how they may help on the development of the children? This might be met by occasional medical inspection, say twenty times in the year. We are not speaking of questions of hygiene or cases of illness. At the inspection, an experienced doctor, looking over the school class by class, would soon select those probably requiring some special care; the teachers would present for examination any child they found specially troublesome, often complaining, short-sighted, very passionate, &c.; and the cases of children excused from attendance on grounds of health would be considered; advice might be given on all cases. At a school I recently visited, a child was presented by the teacher as "not dull but somehow wrong"; grave brain defect was obvious; the advice given was to keep the child, if possible, at school and out of the gutters.

A boy was brought to me who was frequently absent, and often punished when in school; he had harelip, a defect of the heart, and an ill-developed brain. He has a right to be educated, and ought not to be punished for dulness of brain.

In examining a child as to brain condition, general excitability may be expressed by general fidgetiness and finger twitching. The posture of the hand when held out by a healthy child is straight; it assumes a special posture in the nervous, excitable child, and a

different position in simple fatigue. The teeth are usually ground in an ill-sleeping child. The parts around the eyes are visibly relaxed in conditions of headache, making it unnecessary to take a child's word as to whether it suffers; we can see it for ourselves. As to training the brain to stand strains, I believe it is better for the nervous child to be educated. It must meet the shocks and strains of life, and if *properly* educated and exercised it will bear those shocks and strains better than if untrained to think and to exercise selfcontrol.

B. What can be done for these children?

I am not a technical educator; a want is pointed out, and we are prepared to show how this special class of children may be classified, and in individual cases, or a group of cases we can say what will aid brain development.

In classes for the dumb I have seen cases very defective in brain being educated. In the highest class at Darenth Schools I have seen feeble minded children being educated and sent out into the world. Small classes and special teachers could well manage the dull, the excitable, the wrongly made children.

As to the expense of teaching a few children in a small class room, instead of in a large room, would not the money be well spent in an effort to lessen crime, pauperism, and social failure? Should the endeavour be made to educate and save the child, or to reform the drunkard and criminal, and redeem the pauper to society?

I should like to see a tentative effort made. Provide inspection for a few large schools and two small class rooms with suitable teachers, and the truth of these statements would, I think, be soon demonstrated, and the value of classifying the brain power of the children would be recognised. The school examiner classifies by intellectual functions only. Every weakly or troublesome child who now escapes from public education is a failure of the system, and every such child is likely to be a public harm.

He was a good pathologist who gave three reasons why his patient could not get well, he was a better who against all reason rescued him, but he would be best who could prevent him getting sick.

## DISINFECTION.

That well known Sanitarian, Mr. A. Winter Blyth, medical officer of health for Marylebone, Eng., in a criticism on the exhibits of disinfectants at the health exhibition, after referring at considerable length to the different disinfectants in common use, concluded a lengthy address with the following practical remarks on disinfection in general:

A practical study of the question of disinfection has profoundly altered my views, and I have an honest conviction that most of the disinfection by *chemical agencies*, as commonly practised, is worse than none. The reliance that even medical men of repute, still more the laity, place on a sheet wet with a little permanganate hung up before the sick room door, or on a feeble atmosphere of phenol, or a tablespoonful of Burnet's fluid to destroy things, the resistant nature of which is pretty well proved by their persistence, is astonishing. I question whether three horseshoes nailed over the lintel, by which some country folk keep the devil away, would not avail as much.

Specific excreta should be treated with the strongest chemical agencies. They may for instance be cast into the undiluted crude carbolic acid of commerce, which contains from 25 to 50 per cent. of real acids, and there digested for at least *two hours* before being thrown into the common sewer.

House drains in the presence of zymotic disease should not be intermittently but continuously disinfected, so that the walls of the pipes be ever moistened with a disinfectant.

A non poisonous disinfectant is certain to be useless as a germicide. It stands not in reason, that a fluid harmless to mammals, rodents, and reptiles will be destructive of forms of life, some of which withstand a short exposure to the heat of boiling water.

Rampant rides the quack in the fields both of preventive and remedial art. Quackery takes a well known common

powder, labels it with a grand mystic name, selling bright copper at the price of gold. Quackery finds a stink outstinking feebler stinks, and gives it forth as a disinfectant. Of all the substances gathered together under the name of disinfectants—solids, vapours, gases and odours—a small percentage alone possess any value.

Heat, chlorine, phenol, and corrosive sublimate are the sole practicable agents in which I put my trust as germicides, but to have due effect these must be used in a concentrated form, and for a prolonged period. To receive specific excreta in a five per cent. solution of carbolic acid, and then after a few minutes' interval to cast the substances so treated into drains or cesspits, is not likely to afford safety; for the disinfectant will be immediately diluted a thousand or million fold, and cease to inhibit pathogenic activity. The aim of the disinfectant must be not to "scotch," but to kill, and this destruction should take place at the bedside of the patient; on the birth, as it were, of the fever egg.

## STORY OF LIEUT. GREELY'S RECOVERY.

The story of Lieutenant Greely's recovery after his rescue from Cape Sabine is given by Assist. Surg. Green, U. S. N., in the *Medical Record*. The cases of Greely's six fellow survivors were very similar. The condition of all was so desperate that much delay in the camp was necessary before they could be removed to the vessels. Brandy, milk, and beef essence were administered.

Lieutenant Greely's disease is called asthenia, a diminution of the vital forces. Greely fainted after being carried to the wardroom of the *Thetis*. When he received a teaspoonful of minced raw fresh beef was given. His clothes were carefully cut off and warmed, heavy red flannels substituted. "He was excessively emaciated, and his body emitted an offensive odor. His skin hung from his limbs in flaps. His face, hands, and scalp were black with a thick crust of soot and dirt. He had not washed himself nor changed his clothing for ten months. He

had lived a long time at a temperature inside the hut of from five to ten degrees above zero. He was nervous and irritable, at times almost irrational, and his eyes were wild and staring. He insisted on talking, craving news and demanding food, but he complained of no pain."

His tongue was dry and cracked and coated a brownish-black. He was ravenously hungry. Pulse 52, soft or compressible. Skin cold, clammy, shrivelled, and sallow. Temperature under the tongue 97.2°. There was great muscular waste, and he was unable to move or to stand without support. Before leaving Fort Conger in August 1883, he weighed 168 pounds. He now weighed 120. He was carried aboard the *Thetis* about 11 P.M. on June 22nd, it being then broad daylight in that region, and his treatment from that hour until 8 the next morning was a teaspoonful of minced raw beef, alternated every half hour with a teaspoonful of milk punch. Strict quiet was enjoined. On June 23rd Surgeon Green was compelled to allow him to read some letters from home, after which he seemed less restless. He talked rationally, but showed a loss of memory in often repeating what he had previously said. He had not closed his eyes in sleep since his rescue. There was excessive constipation. The treatment was the same as during the night, except that finely cut raw onion was added to the minced beef, and half an ounce of milk punch was given every two hours." June 24th, he had yet had no sleep, and showed a great desire to talk and read, but there were signs of improvement. He was less persistent in demanding food, his tongue was moister, complained of soreness in his l.u.s., and his heart sounded stronger. Surg. Green had him sponged with tepid water and briskly rubbed with flannels. Gave a small quantity of oatmeal thoroughly boiled, beef essence, and scraped beef and onion." June 25th, he slept for the first time, and awoke after two or three hours, much refreshed. He talked without

excitement, and his tongue and skin began to look more natural." June 26th, his mind was tranquil, but there was a loss of memory of words. He was allowed to sit up in bed and read a little. He slept six hours. For the first time since his rescue medicine was given him, some muriate of iron. Next morning he got eight ounces of broiled steak, and on June 28th, he dressed himself and sat up two hours. His food was now gradually increased from day to day, and he continued steadily to improve. July 1st he was allowed to sit on deck for an hour in the sunshine. On July 17th the *Thetis* arrived at St. Johns.

Lieutenant Greely's muscles were now filling out rapidly, and he was allowed to go on shore and take exercise. Here, he committed an error in diet at the American Consul's table, and suffered for two days with a slight attack of intestinal indigestion. On July 25th, for the first time, he was allowed to eat three square meals. Six weeks after his rescue he had gained 49 pounds. He gained 9½ pounds the first week, 15 pounds the second week, 8 pounds the third week, 7 pounds the fourth week, 5½ pounds the fifth week, and 4 pounds the sixth week.

#### SUNLIGHT IN STABLES.

We (*National Live Stock Journal*) tried an experiment, some years since, to test the effect of absence of light upon a calf. We had two deep red calves of the same age, (sixty days), one weighing 180 and the other 182 pounds. The latter we placed in a dark room, with a trough that could be filled by a spout through a partition. The other was confined in the same amount of space, but in full light, and both were fed exactly alike for the next three months. The object was to test the effect of light upon such a growing animal. At the end of that time, the one in the light weighed 430 pounds, and the one in the dark weighed 360 pounds; and its color had faded to a very pale, dirty red. Its eyes were so much affected when admitted to the light, that it kept them closed most of the time for the first week or two. The two calves were kept

on together, but the one from the dark room never fully recovered from this three months of darkness. It never recovered its bright red color, although the color improved. Any one who noted these two calves during this experiment would never after doubt the impolicy of a dark stable. Sunlight is indispensable to healthy vegetable and animal life. Every farmer sees his cat and dog select a belt of sunshine on the floor to lie and bask in; and if he will watch his cattle when turned out, he will find them seeking at once the sunny side of the barn-yard. And with all these indications before his eyes, still the farmer keeps his animals in a dark stable, much to their discomfort and his pecuniary loss.

#### THE NECESSITY OF SANITARY REFORM.

In an article on "The Principles and Practice of House Drainage," by Geo. E. Waring, jr., in the November *Century*, is the following: "Houses that are perfect even in the general arrangement and construction of their sanitary works, are extremely rare. Those which, having begun perfect, continue so under daily occupation, are still more rare. So true is this that it is sometimes asked if it is, after all, worth while to encounter the additional expense and the constant attention that perfection demands; whether, indeed, the world has not got on so well in spite of grave sanitary defects that it is futile to hope for an improvement corresponding with the cost in money and time. The most simple and the efficient answer to this is that the world has not got on well at all, and is not getting on well; that among large classes of the population one-half of all the children born die before they attain the age of five years; that those who come to maturity rarely escape the suffering, loss of time, and incidental expense of unnecessary sickness; that the average age of all mankind at death is not one-half of what it would be were we living

under perfect sanitary conditions; that one of the chief items of cost in carrying on the world, to say nothing of the cost of burying those who die, is that of supporting and attending the sick and helpless; that another great item is the cost of raising children to or toward the useful age, and then having them die before they begin to make a return on the investment; that the great object of a well-regulated life is to secure happiness for one's self and one's dependents, an aim which is crushed to the earth with every death of wife or child or friend. There is a sentimental view, no less important which need not be recited, but which is sufficiently suggested to the minds of all who have had to do with the sanitary regulation of houses by the frequency with which their services are called into requisition only when the offices of the undertaker have been performed. No cost and no care would be too great to prevent the constantly recurring domestic calamities which have had their origin and which have found their development, in material conditions that a little original outlay and a constant and watchful care would have prevented.

#### BALDNESS—ITS PREVENTION AND REMOVAL.

Much of what is known about baldness is summed up by the *Scientific American* as follows: The mode of formation and growth of the hair is now so well known that there can be no question as to the cause of baldness. It is produced by a failure of normal nutrition in the papillae at the base of each hair follicle. Imperfect work being done in the capillaries, which are here richly distributed, the cells which constitute a hair shaft are not formed in their due proportion, the old shaft thus feebly sustained becomes loose and drops away, leaving nothing in its place. This failure of nutrition may have a sudden cause, of which the effect will be but temporary. For instance, an attack of typhoid fever often leaves the

papillæ of the scalp so much onfeebled that rapid baldness ensues. The papillæ, however, still retain their vitality, and as the system regains its strength they quickly recover their potentiality, and the hair comes again, perhaps thicker than before.

In the same manner certain cutaneous affections may cause the hair to fall by an action on the papillæ which is but temporary; in such cases recovery, perhaps with assistance, perhaps without it, is possible. In the great majority of instances, however, where the head is bald the failure of nutrition of each papilla has come on so gradually, and has continued so long, that the papilla no longer exists; it has passed away by atrophy; its capillaries have become obliterated, and even the follicle itself no longer constitutes a depression in the cutis, and the scalp has the smooth and shining appearance which we so well recognize.

It is easy, therefore, to see that in such a condition as this no renewed growth of the hair is to be expected, for the anatomical structure which caused its development and continued it has ceased to exist, and the countless remedies which are so freely advertised as being able to rejuvenate bald heads are utterly of no avail. They serve only to illustrate the greed and the impudence of the inventors, as well as the credulity of the purchasers. But such is the desire to escape the appearance of "growing old" that no doubt they will hold their ground for all time to come.

But now arises the question, cannot the application of the various agents to the scalp, at the time when the hair is *beginning* to lose its hold, be of service in stimulating the follicles and papillæ into renewed and permanent vigor? To this question it is not possible, on theoretical grounds, to say no, absolutely; but in practical fact that is the only true answer to give in the vast majority of cases. The cause of the falling of the hair has been already stated, and safe reasoning

tells us that our only hope can be in that which can restore the failing vitality, and we well know that we should not expect to secure this on any other part of the skin by filthy oils and washes. Proper cleansing of the scalp is as important as it is of all other parts; nothing else should be applied to it but common sense.

There can be little question that the continued close covering of the head with hats and caps is one very constant cause of baldness. Women, in our own communities, seldom lose their hair, except from sudden causes: and among those nations where the head is habitually left bare or but slightly covered, baldness is practically unknown. At the same time the beard, which is of the same class of hair as that of the scalp, but which is always uncovered, does not fail with age. A reform in our style of head gear is very desirable, but it is not at all likely to be accomplished.

The suggestion was some time ago made in our columns that bald heads might perhaps be covered anew with hair by "skin grafting," *i. e.*, applying bits taken from other scalps and causing them to take root and spread. No doubt such bits might be attached, but the whole matter is merely a wild fancy without practical value. We can make "skin grafts" take hold, but it is only where the skin is destroyed and the surface raw and exposed, commonly rendered so by disease. Assuming that some person (though it is difficult to believe that such a person could be found) would consent to have his scalp peeled away in preparation for the operation, and then assuming that some other person could be found who would consent to appropriate his own scalp to cutting out the proper bits for the work, yet then the very best possible success (even theoretically) must be extremely imperfect. The denuded surface would heal so rapidly between the "grafts" that no extension on their part could take place, and a head with small specks of hair here and there would be the only attainable result. "Crazy patch-work" is fashionable, but perhaps not many would care to wear it in that way.

The result of all seems to be that when baldness has come slowly and naturally, it has come to stay, and our only wisdom is to be content.

VALUE OF WATER DRINKING—ITS DIURETIC EFFECTS.—Dr. Laudor Brunton, a high authority, in a recent number of the *Practitioner* (Eng) tells us that the drinking of water increases tissue change, but removes the waste products as soon as they are formed. In persons who are accustomed to take too little water, the products of tissue waste may be formed faster than they are removed, and by accumulating, may lead to disease. Fatigue is to be regarded as the imperfect response of muscles and nerves to stimuli, and such an imperfection in their action may be due either to their imperfect nutrition, or to the imperfect removal of the products of their waste. There are many people who awake in the morning feeling languid and more tired than when they went to bed. Though such persons are often well fed and sleep soundly, and though they get better after walking about a little, yet Dr. Brunton thinks their languor depends on imperfect removal of waste products from the body, and has found that a tumbler of water taken just before going to bed, often prevents this languor.

ON ABUSES in connection with placing persons in asylums, after referring to the increase of insanity, especially amongst women, in whom it was frequently traceable to cerebro-nervous disorders originating in reflex irritation from utero-ovarian causes, Dr. T. More Madden said, these disorders, however, were very frequently unrecognised and neglected in lunatic asylums, the result being, that many women were needlessly confined or improperly detained in such institutions. The present administration of lunatic asylums and the laws by which it is directed, afford scope for the possible occurrence of abuses. The facility, he continued, "with which any person can be legally confined as a lunatic is indefensible, seeing that any two of the most inexperienced of the 24,000 practitioners on the medical register can virtually consign any man or woman to a lunatic asylum." That this power was liable to abuse he illustrated by cases in his own experience. He suggested that the power

of signing certificates should be restricted to certain officially appointed medical inspectors of lunatics; and that in the case of alleged female lunatics, one of the inspectors should be a physician with some experience of the special functional disorders, the reflex consequences of which may either simulate or eventuate in insanity. The "facilities" in Canada are equally "indefensible," and we have sometimes feared might be abused.

A YOUTHFUL SANITARIAN.—Dr Bartlett, F. C. S, &c., in an address delivered at the meeting of the Sanitary Institute of Great Britain, July 16, referred to the written examination of May Austin, aged 13, who sent in a paper from a Board School, Birmingham, in answer to the question 'What special points would you think of in choosing a house?' her answer was 'Dryness, light, good air, good water, and good drainage.' In delineating these 'principle points,' her descriptions, were so terse and full, so complete, and left out so little of what is essential, that unless the whole examination and teaching the cut-and-dried result of mere *memoria technica*, nothing could be more satisfactory. If May Austin, says Dr. Bartlett, can reply on paper equally well to half a dozen more questions coming equally within the scope of our own examinations, and pass a by no means more difficult *viva voce*, he feels bound to admit to himself that he, as an examiner of the Sanitary Institute, must pass that very clever little girl—certainly as a sanitary inspector, and perhaps as a local surveyor.

HEREDITY.—Of ninety-two children conceived during the siege of Paris by the Germans, M. du Saunle found that sixty-four had physical, intellectual or affective anomalies and the rest were small and sickly. Alcohol, inanition and the mental state of the parents all doubtless entered into the list of causes.

In the most densely-peopled districts of London there are but 170,000 persons to the square mile. New York has 290,000. London has an average population of 7 persons to each house. New York has 25. One block in the Eleventh Ward has 45 occupants to each house. Vienna has an average of sixty persons to each house,

### Leading Articles.

#### THE WORK OF MEDICAL HEALTH OFFICERS.

From time to time in this JOURNAL attention has been drawn to certain and various unsanitary conditions which might profitably engage the attention of medical health officers in any municipality. Now that many such officers are being appointed, throughout the province of Ontario especially, it is all the more necessary that all such conditions should receive consideration in these pages. Amidst the many and constant engagements of a large practice, it is most natural that the medical practitioner, on accepting the responsible position of medical health officer, after asking himself the question, "to what sanitary evils can I first and most profitably turn my attention?" would require to consider the question for a little time before being able to answer it to his own satisfaction.

Of all sources of sickness, it is probable that those from which waste excremental matters find their way back into the body again are the most prolific. And of all these sources the privy vaults are without doubt by far the most common and important. Where boards of health there fore can be induced to enforce in their municipality—be it city, town or village, or even township, the adoption of some method of disposal of human excreta more in accordance with health and with what one would naturally expect as an outcome of modern civilization than the present too common one, there good will be accomplished; and medical health officers may by their influence often do a great deal in the way of inducing action in the direction indicated. The village of Parkdale, a western suburb of Toronto, is probably the only municipality in Canada where the use of privy vaults is prohibited. There, four or five years ago, when the writer of this was medical health officer for the village, the council were induced to pass a by-law prohibiting

any collections of excremental matters in vaults, and requiring all householders to use earth or ash closets or to dispose of the closet excreta at frequently repeated intervals by mixing it with the soil in the gardens, or by having it removed out of the village. There is probably not a village nor town in any of the older settled parts of Ontario, in the neighborhood of which there are not farmers who would be glad to cart away at sufficiently frequent intervals all the excreta of the place if such were mingled, and thus deodorized, with earth or coal ashes.

We believe, then, it is of the first importance that all boards of health should take such prompt action as shall secure in their municipalities the proper disposal of all excremental matters, and more especially of human excreta, it being the most concentrated and offensive of all, and most likely to produce disease.

With the proper disposal of all refuse, the purity of the water supply will be promoted, and it would be well for health boards to next turn their attention to the milk supply.

Milk dealers may require to be taught the great danger arising from a case of any infectious disease at the dairy farm or any where near the milk supply, and to exercise sufficient care to prevent such danger. Diseased—probably tuberculous, cows are not infrequently milked for months together, and the milk dealt out to unsuspecting customers. Sometimes probably the diseased condition of the cow may be unknown to the owner—symptoms of disease sometimes not being plainly manifested at an early period. During the cold weather the cow byres should be closely looked after by municipal authorities, as cows are often housed in dark, damp, filthy stables, in which no cow can remain long in a healthy condition.

The isolation of persons affected with infectious diseases is another matter requiring the attention of health boards. We will defer the consideration of this however for another occasion.

## OVER-PRESSURE IN SCHOOLS.

The subject of over-pressure in schools, especially in the elementary schools, is just now receiving a good deal of attention in England, and a commission of enquiry is urged by medical and other journals. In Switzerland, too, the subject is being investigated, and it is attracting a good deal of attention in other countries in Europe and in the United States. The school children in Canada, with the present educational system, are quite as likely to suffer from over-pressure as the school children in any other country. Statistics of over-pressure are difficult to obtain. Many are of opinion, however, that much injury is being inflicted in our public schools in this country by the indiscriminate competitive system, with its multitudinous subjects of study, long hours and home lessons, and that it is high time something were being done to check the inevitable and increasing evil.

In England some months ago the President of the Education Department invited Dr. Crichton Browne, a physician of eminence there, to visit some of the public elementary schools in London in company with one of Her Majesty's Inspectors, Mr. Fitch, and to favor him with an opinion of their working from a sanitary point of view. Dr. Browne, as it has been said, was "sent to bless but came back to curse." He reported strongly against the present system. Mr. Inspector Fitch has been trying to take the sting out of Dr. Browne's report and a warm controversy has been the result. The Inspector, it appears, only accompanied Dr. Browne to a small proportion of the schools visited by the latter, and is not in a position to fairly question the doctor's statements. The *London Medical Times* (of 11 Oct. inst.) in an editorial on "the progress of the over-pressure question," asserts "it is now more than ever clear from this controversy that further investigation should be made by the Government on this matter, and should any corroboration of this contention be asked

for it may be found in the great consensus of medical opinion shown in the correspondence on over-pressure which has recently appeared in our columns. The letters we have received on this subject are certainly free from bias, representing for the most part the impressions received directly from experience, and by no means conclusions drawn from facts observed with any preconceived object of enquiry. The seven physicians who have addressed themselves directly to the question at issue, all of them on the active staffs of our hospitals for children, are of opinion that cases of chorea in its various degrees, frequent headaches, and disturbed sleep, are often to be attributed to overwork at school; and it must undoubtedly be inferred, though it may not be possible with the data at present at command to demonstrate conclusively the evidence of fatal or permanent effects of over-schooling, that the evils resulting therefrom are of sufficient magnitude and frequency to arrest the attention of those who administer the education code."

One of the *Times'* correspondents referred to in the above extract, Dr. Surges, of London, physician to the hospital for sick children, writes, "it is only upon the most direct evidence that these common complaints of children, and especially of London children, are to be put to the charge of what is called over-pressure. And assuredly such direct evidence is not wanting. Instances of nervous injury from over schooling are, I am persuaded, far from infrequent, and they are all of one pattern, girls suffering in far larger proportion than boys. Let the initial cause be hard lessons, or lessons which, without being hard, are to be learnt at home, where "home," as a matter of fact, is not a place suitable for study, but is put to far other uses; or let it be the fear of punishment or the excitement of competition in school examinations, the effect is broken and uneasy sleep disturbed by visions of sums and spelling, loss of spirit and appetite, and presently general failure of health. And it is very curious, as well as very pitiable, to notice how symptoms like these, once started, are kept going, so to speak, of themselves. Children so affected are

seldom brought to hospital until a long course of suffering has developed some complaint or other to which a name can be attached. But once overmastered in this way, all hope of recovery is taken away until the child's true condition is recognised, for there is daily failure and disgrace along with daily increasing inability to perform the allotted task.

It is not alone in England that the subject is attracting attention. In the section of Psychological Medicine at the recent International Medical Congress, Dr. Kjellberg, of Upsala, "gave a startling description of the effects of excessive brain work on the health of school children. The symptoms he had noticed were much the same as those met with in the out patient rooms of children's hospitals in London and our large towns, viz: headache, sleeplessness, intellectual torpor, change in character, muscular weakness and spasm, culminating in hallucinations, and very often in sudden loss of consciousness." Statistics have been collected in the schools of Switzerland with the result that the cases of over-pressure are found to be so numerous that the cantonal governments are considering how best to modify a state of things so threatening.

The *Educational Times* holds that "it is quite time that the effect of the educational arrangements on the general health should be investigated by professional and disciplined enquirers, and be reported on with judicial impartiality." It cordially supports Dr. Chrichton Browne's proposal to institute a sanitary and medical inspection of schools, a periodical measurement and medical examination of the children; while it fully realizes the importance of medical opinion in connection with the subject. "The medical profession," it says, "may render great service to education at the present time by collecting observations on the question of the effect of the present educational arrangements on the general health. Applicable to Canada are the following remarks of the *Times*: Let us take warning in time, and if possible seek to forestall the appearance of such startling effects as those described by Dr. Kjellberg. It would be deplorable if our efforts to get on in the world should result only in a nation characterized by physical and intellectual torpor.

### Matters Recent and Current.

**SANITATION IN TORONTO.**—As the queen city, Toronto makes very slow progress in sanitary work. As in most cities there are there abundance of unsanitary conditions. Beyond the ordinary process of scavenging, which the city commissioner continues to carry out probably as thoroughly as possible with the means at his command, and a system of sanitary police visitation, which does not seem to be of much practical use, very little is being done to improve the sanitary condition of the city or promote the public health. The people have been occasionally discussing the trunk sewer question for not very much short of a quarter of a century, and it is probable that before another quarter of a century has passed the trunk sewer will be built. Some one has proposed that they should construct, as a substitute for a trunk sewer, a sort of sluice way along the edge of but within the bay—indeed make a sort of trunk sewer of a narrow portion of the bay, instead of using the whole bay, as at present. The proposer was wise enough, it appears, to withhold his name from the public. He must have made the proposition as a joke.

A SANITARY ASSOCIATION has at length been organized in Toronto, after many vain efforts toward that object. From this much is hoped for, and it is probable that considerable good will be the outcome of it. Mr. Henry Langley was elected president and Mr. Alan Macdougall C. E. &c., Associate Editor of this Journal, secretary. A council, composed of six members—two medical men, two architects, and two plumbers—were elected, who were chosen as having close practical connection with sanitary work—house building, ventilation, drainage, etc. The following are the names of the council: Architects, S. G. Currie and H. B. Gordon, plumbers, John Ritchie, Sr., and W. J. Burroughes; physicians, Dr. Geo. Wright and Dr. Oldright. At a late meeting the president stated that at the meetings to be held each month, it was proposed to have papers on various sanitary subjects of interest to the city

read and discussed. On motion by Dr. Bryce, it was decided to communicate with the secretary and trustees of the public school board, and request that certain schools in the city be placed at the disposal of the association during the coming winter for the purpose of holding sanitary classes and delivering lectures on sanitary subjects.

A TRUNK SEWER is absolutely indispensable to the well being of the city, and the want of it, through the fouling of the bay, has no doubt already cost many thousands of lives, especially of infants, by means of foul air and foul water. But the trunk will greatly increase the danger from sewer gases in dwellings unless a much more efficient method of ventilating the sewers, both the present mains and the trunk, is adopted, as it will materially obstruct the outflow of gases. One strong objection to the trunk, too, is the slight fall that can be obtained, for the flow of sewage, between the garrison creek and the Don. A free outflow is most essential in the water-carriage system.

A REMEDY SUGGESTED.—By the construction of a large deep tank at the east end of the trunk, that end might be made much lower than has been contemplated, and the fall the entire length of the trunk greatly increased thereby. This would necessitate the constant pumping of the sewage out of the tank. But much better this than a poor slow outflow of the sewage. At the same time the sewage could be pumped up onto the high waste ground east of the city, and so purified by epuration before flowing into the lake. This would afford a great opportunity for a sewage farm (see pages 1 to 5), from which the city could be supplied with abundance of vegetables. And an abundant supply reduces prices. As things are now there is "wilful waste" of valuable material, which might be utilized in supplying what is sometimes a "woeful want" of fair priced vegetables in the city. "There is that which scattereth and yet increaseth, and there is that which withholdeth more than is meet, but it tendeth to poverty."

EXTINCTION OF THE DON MARSH.—The suggestion has already been made in this JOURNAL that the Don Marsh might be filled in and made into solid ground with earth from the "heights" east of Toronto. One good earth-car load of solid earth per minute during ten hours a day for five years would raise one thousand acres of the Marsh about six feet. The cost of this at two dollars per car load would be less than two millions of dollars. One thousand acres of land at two thousand dollars per acre would be worth two millions of dollars. Would not a thousand acres of solid land at the Don Marsh be worth more than that sum? And the improvement in the public health in the neighborhood would be inestimable if there were no Don Marsh.

THE TORONTO WATER SUPPLY.—The people in Toronto have been recently greatly exercised over this. Over and over again they have been informed by the SANITARY JOURNAL and other Sanitarians that the water was far from being what it should be—that it was not pure, and doubtless received sewage from leakage into the pipes; that the water in the Bay was very foul; and at some other mode of sewage disposal should be adopted. But prophets are not without honor except in their own country. Prof. W. L. Carpenter and Dr. Stevenson MacAdam, "all the way from London," tell them the terrible fact—tell them "That the whole of the water in your bay is more or less contaminated with organic matter, and probably in a degree dangerous to health," and that "the present mode of the disposal of the sewage is extremely primitive, and independently of the pollution of the water supply must be immediately dealt with." And behold the people are greatly exercised indeed. But they will soon recover their usual equanimity and indifference. Probably even from these warnings the trunk sewer will not be built any the sooner.

IN MONTREAL much the same thing has occurred. Dr. MacAdam has been lecturing there on Sanitary Science, and the *Medical Record* says, "our local

sanitarians have again and again pointed out the requisites laid down by the lecturer, but being home productions these have fallen unheeded on the mind of our prominent citizens. The lecture is a valuable one, and we trust may bear some fruit, but there is nothing new about the subject, and the same advice could have been given by members of the medical profession here."

**DIPHTHERIA IN CANADA.** — There has been some discussion in relation to a great increase of diphtheria in Canada, and our opinion has been repeatedly asked in relation thereto. Certainly there have been an unusual number of outbreaks of the disease reported in various parts of the country, but from exchanges we learn of like frequent reports in Europe and the United States. Diphtheria is apparently increasing in frequency in most countries. In Russia it has been recently reported as very prevalent and fatal. We have no reason to believe that the disease is any more common in Canada than elsewhere.

THUS FAR KOCH has not been able to show that the comma bacilli did produce cholera. Nor has he demonstrated the early life history of the bacillus. In the *British Medical Journal* (Sept. 6th) what seems to be its life history is given by Drs. Maurin and Lange. These observers continued working at Marseilles, and report that they have found a mucor, or mould, which they regard as the actual agent in propagating the cholera. This mucor appears, on the fourth or fifth day, on putrefying cholera stools and on these only. It has the form of a mycelium, with cup-shaped sporangia, which burst on the slightest agitation, discharging vast numbers of spores. These spores, it appears, require for their germination, contact with some putrid organic matter, on which they develop into a mucor of another form, an anærobium, not requiring oxygen, which the Drs. believe to be the immediate cause of the disease, and which again, in its turn sporifying, produces the bacilli of Koch.

THE BACILLI ARE INNOCUOUS, it appears, as bacilli, but when deposited on putrid

matter in the atmosphere, they develop the first mentioned mucor, and so renew the cycle of phenomena.

A STRIKING CONTRAST between the bacillus and the mucor which springs immediately from it is that, while the former is, as Koch found, incapable of resisting the feeblest acid, the mucor defies most of the reagents commonly fatal to low vegetable life. It was not killed by a ten per cent. solution of sulphuric, hydrochloric, or carbolic acids, nor by a temperature under 302° F., though higher temperatures, or a ten per cent. solution of tincture of iodine, destroyed it. It is said that a specimen preserved in oil of turpentine, intended for presentation to the Academy of Medicine, continued its development unchecked, bore conidia, and scattered its spores throughout the fluid. This recalls, says an exchange, the utter failure of disinfectants in 1806 to check the spread of cholera in Erfurt, Stettin and Leipzig, though used in such profusion that at Erfurt the very wells reeked of carbolic acid. "Should these observations be substantially verified they will elucidate to a degree which we can but faintly realise the perplexing phenomena of the ætiology and propagation of cholera."

PARTLY DIGESTED FOODS are gradually coming more and more into general use. Such foods are valuable not only for the convalescent with weak and imperfect digestive powers, but for men engaged in active employment, especially during the middle of the day, who hardly take time to eat and who are not in a condition to properly digest ordinary foods. It may be that the time is not far distant when man will subsist largely or wholly on foods which have been partly or completely digested, when the large amount of force now expended in the digestive process may be utilized in some other way—in mental or physical labor. Mr. H. P. Gisborne, of Toronto, manager Canadian branch of the Maltine Manufacturing Company of New York, is about to commence the manufacture of "Liquid Beef Peptonoids" which, besides being partly digested, will be vastly more nutritious than any of the beef extracts

or preparations of so called "Fluid Beef." The Liquid Beef Peptonoid is now manufactured in New York. Mr. Gisborne will also manufacture a preparation of iron and wine and also of cod liver oil and milk, both partly digested.

**DEATH-RATE AND SICKNESS-RATE.**—At the late meeting of the Sanitary Institute (Gt. Brit.) early in the present month, in a paper by Dr. Grimshaw, Registrar-General for Ireland, on the statistical measures of the Health of Communities, the writer said that the death-rate did not by any means represent the amount of sickness in a district, some diseases, such as influenza, having no death-rate at all. Unfortunately no other method had yet been discovered which would furnish results that could be used by the benefit societies. "A death-rate of 40 per 1,000 did not necessarily mean that the place was twice as unhealthy as one which had a rate of 20 per 1,000; it indicated that the people of the latter had a more robust constitution, but nothing else."

**A GOOD INDICATION OF SICKNESS-RATE,** Dr. Grimshaw thinks, may be found in the relations between marriage-rate, birth-rate, and death-rate; "I think I may ask you to take my word for it that when these three rates bear an undue proportion to one another in any given community there will be found to be serious defects in the health of that community, and not improbably a serious defect in its moral as well as its physical health. The relation between cleanliness and godliness is deeper than many who use this common proverb are aware."

**CHEESE POISONING.**—At the regular quarterly meeting of the Michigan state board of health, held on the 7th inst, the secretary, Dr. H. R. Baker, reported seven outbreaks of cheese poisoning in Michigan during this year, in which there were 190 cases of sickness, but no deaths. The symptoms following the eating of the cheese were very similar in all cases, pain in the stomach, cramping of muscles, coldness of extremities, and great prostration, with violent retching and purging, lasting for several hours. In most cases the larger the amount of cheese

eaten the more violent were the symptoms. Samples of the Lowell cheese had an acid reaction and a peculiar strong odor. Examined with a magnifier, this cheese was found to contain the mycelium of a mould, and to be swarming with several kinds of actively moving bacteria. Samples of the cheese were sent to experts for further examination and experiment.

**RECOVERY FROM BITE OF A COBRA.**—The *Pioneer* gives a recent instance of recovery from the bite of a cobra. An officer of the 1st Goorkhas, while staying at Kangra, was bitten by a cobra in the hand. With great fortitude he seized a gun and blew off the finger that had been bitten. When medical aid arrived, he was almost insensible, and it was only by keeping him walking about all night and administering large doses of brandy and ammonia that he was pulled through.

**VACCINATION AND RABIES.**—At the International Medical Congress at Copenhagen, August 11th, 1884, M. Pasteur delivered a lengthy address on his experiments in relation to rabies. He said, when an animal dies of rabies (and we know that the disease invariably ends in death), it is absolutely certain that one will be able to obtain from the animal's *bulb*, the uppermost portion of the spinal cord, which forms the point of transition between the cord and brain, rabies-virus, which will produce the disease by inoculation on the surface of the brain in the arachnoid cavity, after previous trephining. If you take any street-dog you please and inoculate rabies in this manner by trephining, using as inoculating-material a portion of the bulb of an animal which has died of the disease, you will invariably convey rabies. The dogs to which the disease has been communicated in this manner are to be counted by hundreds. The method has never failed. The same operation has been performed on hundreds of guinea-pigs and on a yet greater number of rabbits, without a single failure.

M. PASTEUR said, on May 10th, 1882, there were introduced into the popliteal vein of a dog, ten drops of a fluid which had been obtained by macerating in three

to four times its weight of sterilised broth, a portion of the bulb from a dog which had died of rabies after being found in the streets in a mad condition. A second dog was inoculated with a hundredth part of the quantity, and a third dog with a two-hundredth. The first dog was seized with rabies after an incubation period of 18 days, the second after 35 days, the third remained unaffected; *i.e.*, in this last case, and by the method of inoculation used in this experiment, a certain quantity of virus proved insufficient to produce rabies. This last dog was susceptible of rabies, as all dogs usually are, for it was again inoculated on September 3rd, 1882, and was seized with rabies 22 days later.

IT IS NOT IN THE QUANTITY of the virus therefore by which protection is afforded, but through some changes produced in it by cultivation, which is nevertheless called 'attenuation'. M. Pasteur continued, many attempts were made to attenuate rabies-virus by passing it through the bodies of certain animals. But in the majority of the experiments on animals, the poison increased in virulence, just as in rabbits and guinea-pigs; fortunately this was not so in the case of monkeys. After detailing his experiments with monkeys he says;—it is thus impossible to doubt that by transmission from monkey to monkey, and from the different monkeys to rabbits, the strength of the poison is weakened in the latter just as it is weakened in the dogs. The application of these facts yields a method of vaccinating dogs as a protection against rabies.

THE COMMISSION ON RABIES asked for by Pasteur, has performed experiments on thirty-eight dogs, nineteen of which had been supplied by Pasteur as insusceptible to rabies, while the other nineteen could be made mad. As to the present condition of the dogs which have been the subject of enquiry, the Commission report that, in the case of the nineteen trial dogs, of six which were bitten, rabies occurred in three; of seven which were inoculated in a vein it occurred in five; and of five which were inoculated by trephining it

occurred in all; while not a single sign of rabies has shown itself in any of the nineteen vaccinated or protected dogs.

M. PASTEUR ENQUIRES, "is the application of the new advance to be confined to the prevention of diseases in animals?" We most certainly hope so. During the course of the commission inquiry one of the protected dogs died from a sanguineous diarrhoea. Pasteur says, "in order to determine whether rabies had any share in its death, three rabbits and one guinea-pig were at once inoculated with its bulb by trephining. All of these four animals are still in the best of health, which is a certain proof that the dog did not die of rabies, but of a common disease." But is it a certain proof that the rabies poison had nothing to do with causing the death of the dog?

DISINFECTANTS.—At the Health Exhibition recently Prof. de Chaumont delivered to a numerous audience a lecture on the Prevention of Cholera. The most important point in the advice he gave was, his warning about disinfectants. Fire, he said, was the only true disinfectant, most so called disinfectants being simply deodorants. If there existed a system of drains properly flushed and properly protected, there would be no need for disinfectants. In other words, have all excremental matter completely removed.

INTERESTING EXHIBITION.—The supra-conservative *Medical Times and Gazette*, London, Eng., has been forced to change its views once more. It had opposed the germ "theory" of disease, and also the teaching of such subjects as physiology in the schools, because "a little knowledge," &c. In referring to the Biological Laboratory, under the charge of Mr. Watson Cheyne and his assistant, Mr. Joseph Lister, at the International Health Exhibition, the *Times* says (Aug. 30th, '84). "Obviously no greater incentive to safeguard health can be imagined than a study of the life history of the organisms, whose entrance into, and development within, the body constitutes disease, and of the power of

chemical agents in destroying them. Nor can any objects be conceived more likely to convey a powerful lesson or more surely point a moral, than the ocular demonstration of the germs which work such disaster amongst us...Further, the knowledge of the existence and life history of germs will never be of much service to humanity so long as it is confined to the medical profession only. Hence the importance of the present laboratory in connection with the International Exhibition at South Kensington, serving as it does to bring before vast numbers of the public the germs themselves, and expose in tangible reality the existence, specificity and characteristics of each."

**ON THE INCREASE OF INSANITY,** Dr. T. More Madden, in a paper read at a meeting of the Academy of medicine in Ireland in August, inst., said, although the recent increase of insanity had been disputed as a popular fallacy, even by psychological authorities, including Lunacy Commissioners, the statistical evidence of the fact was incontrovertible. At present, one in every 414 of the population of England and Wales is a registered lunatic; while in 1800, there was only one lunatic in 7,300 of the population. In 1806, there were 2,248 lunatics in England and Wales; in 1819, 6,000; in 1823, 8,000; and in 1826, 14,000. In 1845, there was one in 800 of the population insane, and thirty seven years later, one in 414. In Ireland, since 1851, the population decreased 12 per cent., and there has been an increase of 41 per cent. in the number of lunatics. In 1851 the number was 9,980, or one in every 1,291; but last year it had risen to 13,820, or one in 369. The increase had been greater amongst women than men.

**EXCRETA AND DISEASE.**—In an editorial in a late number of the *Journal of the American Medical Association* the editor writes: "The progress of civilization has demonstrated no one thing more clearly, than that soil and water contaminated by the presence in them of excretory and refuse matters are capable of engendering several of the most distressing and fatal diseases we have to encounter. And yet such contamination has commenced, and

is progressively increasing wherever the excretions and refuse are either deposited in cesspools, sunk in the soil, or turned through sewers into the neighboring waters, whether of brook, river, lake, or sea. The evil has chiefly attracted attention in connection with the sewerage of cities and manufacturing towns, but it exists to a greater or less degree wherever human beings become permanent residents.

A SANITARY CONVENTION, under the auspices of the Michigan State Board of Health, will be held at East Saginaw (Mich.) on December 2nd and 3rd; to which we have received an invitation, and hereby tender our thanks for the same.

THE 'REFUSE DESTROYER' is the name of a very useful furnace recently invented by a Mr. Stafford, engineer of Burnley, which has been doing such efficient work in consuming street and other refuse by fire that it promises to be extensively adopted. Street sweepings, the offal from slaughter-houses and fishmongers' shops, and unpleasant waste matters of all kinds treated in this furnace are rendered not only harmless, but are converted into a residuum which can be utilized for mixing with mortar, and for other purposes. Hence the machine can be made almost self-supporting.

**NEW AMBULANCE.**—The medical officer of the Metropolitan Asylum board has invented a new ambulance. The improvement consists in a double layer of perforated metal enclosing an absorbent material saturated with a 'germicide,' or destroyer of the minute microscopical particles which tend to propagate disease. Fresh air is admitted through modified improved 'Tobin ventilators' of a horn-shape, with the large end opening externally, whilst the smaller extremity inside the van is provided with a disinfecting air-chamber, constructed like those attached to the other apertures or windows. These improved ambulances are in use by the Metropolitan Asylum Board.

THE LAST NUMBER of the *Glasgow Sanitary Journal* reports another outbreak of enteric fever, evidently connected with a contaminated milk supply. "And

it is surprising," says the Journal, "how little alarm, and even interest, have been, in consequence, aroused in the public mind. Judging from newspaper notices, public references, and letters of correspondents, this epidemic, perhaps the most alarming that has ever appeared in Glasgow, has been a decided failure even from a sensational point of view. People have got accustomed to milk-typhoid epidemics; so that they possess no novelty.

A LATE NUMBER of the *British Medical Journal* says that the laws compelling medical men to report infectious disease to the local health officer are of no advantage, as the history of their operation shows; facts show that in various places the laws had to be altered so as to place the control of the patient in the hands of the doctor; concealment of disease has been promoted; untrustworthiness in returns is encouraged; distrust is excited between the doctors and their patients and conflict between the doctors and health officers.

DR. KLEIN, of the English cholera commission now in Calcutta, in pursuing his investigations, has, it is said, swallowed microbes of cholera, convincing himself that Koch's bacilli are harmless. The experiments of Drs. Maurin and Lango referred to elsewhere, also show the harmlessness of the bacilli, as bacilli.

ANOTHER SACRIFICE.—Dr. Samuel Rabbeth, Sen. Medical Officer of the Royal Free Hospital, London, Eng., has sacrificed his life by his unselfish efforts to save the life of a pauper child by sucking at a tracheotomy tube to remove an obstruction caused by diphtheria.

A JUST WARNING TO LANDLORDS.—In a suit for rent claimed from a tenant for a suite of rooms in an apartment house in New York, it was shown that the defendant's wife and servants had been sick from inhaling poisonous gas in the apartments occupied by them, owing to the defective condition of the plumbing work, of which the landlord had been notified. The defendant waited for two weeks when, nothing being done, he left. The

judge decided that the tenant could not be forced to pay rent during that portion of his lease subsequent to his removal. The decision has been affirmed by the Court of Common Pleas, and unless reversed by the Court of Appeal, will be the law in future.

A REWARD of \$100,000 (*New York Med. Times*) is provided for in a bill recently introduced into the United States Senate to any person who shall discover the true germ of yellow fever, or any certain way of preventing or materially modifying the spread of the disease.

THE ELECTRIC LIGHT IN DWELLINGS.—A Mr. Tayler-Smith it appears has devised a system which will overcome the difficulties heretofore experienced in lighting dwellings with the electric light. After the first installation the cost is but little if at all in excess of gas to supply the same light. It is to be hoped the public will not be slow in appreciating the full value of a good light with a pure atmosphere.

DR. KOCH has refused the invitation to Leipzig to fill the chair left vacant by the death of Professor Cohnheim, having decided to remain in Berlin. It is understood however, that before taking this step he received assurances that no long time will elapse before he is installed in the chair of hygiene, which is to form part of the new hygienic institute to be founded on a very comprehensive scale. With this will be associated the directorship of the *Reichsgesundheitsamt*.

It is announced in a Vienna medical journal that Dr. Koch has succeeded in proving the communicability of cholera to animals by means of the bacilli and that rabbits have been so infected.

MR. HUMPHREYS, an eminent statistician, will shortly collect and publish the miscellaneous statistical works of the late Dr. Farr, formerly registrar-general of England.

THE ATTENDANCE at the health exhibition in London has already exceeded the number which attended the fisheries exhibition. Nearly three millions of people have passed the stiles of the exhibition.

MR. J. NETTEN RADCLIFFE, recently assistant medical officer of the English local government board, died September 12, aged fifty-seven years. He was an earnest hygienic worker, and began as a volunteer in the Turkish army in the Russo-Turkish war of 1854-55. He invented a tent-hospital which bears his name. In 1874, his report on the prevention of excrement nuisances in towns was published by the local government board, and is regarded as a standard work.

THE AMERICAN PUBLIC HEALTH ASSOCIATION held their annual meeting in St. Louis during the present month. Some of the papers read and discussed were exceedingly valuable, and synopses of them will be published in this journal hereafter. The sessions were all well attended, and a large number of new members were received. Dr. Covernton, President of the Ontario Board of Health, and Dr. Bryce, Secretary, were present as delegates from the Ontario board.

AN ITALIAN PAPER, *Echo di Bergamo*, says that "the prevailing superstition there is incredible, and not confined to the poor. Physicians are distrusted, and Medicines suspected. In one place people are ready to swear that the doctor receives 20 lire (\$4) for every cholera patient who dies under his treatment, and that when his victims amount to a thousand he is rewarded with a pension! The result is that not only is the physician never sent for in time, but when he arrives, his services are refused. As it is generally the priests who send for him, the suspicious friends decline to call in the priest.

A REPORT has come from Washington that the carcasses of one thousand hogs, dead from hog cholera, had been thrown into the Potomac river and the canal, from which the water-supply of the City is derived. The health commissioner has requested the governors of Maryland and Virginia to take action to prevent farmers thus disposing of their dead animals.

THE PLUMBERS' company of London are considering the desirability of action being taken by which the condition of the trade may be advanced, and the public

interest be protected from bad workmen and bad work, and are advocating a system of examination and registration of plumbers.

DIPHThERIA IN CATS.—The board of health of Amsterdam, N. Y., says the *Sanitary News*, have recently investigated an outbreak of diphtheria. The disease was traced to a pet kitten, with which a little girl played while the animal was sick with a swollen throat and discharge from the nose. The cat died. The child was taken sick, and died. Another girl played with a doll which had belonged to the deceased child; she was also taken sick, and died. Still another contracted the disease without other means of communication than the doll. The latter was supposed to have been disinfected. The *News* reports several cases in which it appeared clear that this disease had been communicated to children by cats.

A SOCIETY for the study and cure of inebriety has been formed in England. It consists of medical men as members, and laymen as associates, for the study of the various physiological and psychological causes of inebriety in the individual, and for the presentation of the physical aspects of inebriety. Dr. Norman Kerr is President, and among the Vice-Presidents are Drs. Burrows, Spencer, Wells, Cameron, Carpenter, Richardson, Britton, and others among the leading scientific men of Great Britain. There has been for many years a similar society in Connecticut, U. S.

ON THE PARIS WATER SUPPLY, Prof. Gantier, in the name of the *Conseil d'Hygiène*, remarks, the water supply of Paris is divided into two distinct classes; 1st, public services, namely, watering the streets, supplying manufactories and bathing establishments, from the Canal de l'Ourcy, a tolerably impure source. 2nd, private services, namely, water distributed in houses for home purposes, derived from two small rivers, both remarkably pure. Each inhabitant of Paris receives daily between 50 and 60 gallons of water.

THE crematory of the United States cremation company has been commenced at Newton, Long Island,

JUDGE WHEELER, United States circuit court, decided that in taking children who were suffering with whooping-cough to a boarding-house, a man was liable for damages to the mistress of the house, because her child contracted the disease and boarders were kept away.

"HEAP'S PATENT" DRY INODOROUS EARTH OR ASH CLOSETS.—At the recent Health Exhibition in Dublin, in connection with the Sanitary Institute of Great Britain and Ireland, opened 30th Sept. last, these closets were awarded "the medal." This makes 13 Prize Medals awarded to "Heap's Patent." The closets have been manufactured at Manchester, England, and shipped to almost all parts of the world, over 15,000 being now in use, Mr. Heap recently came to Canada and started a Factory in Owen Sound, where he has just formed a Joint Stock Company. This company intend to manufacture these closets on an extensive scale, and to have Depots in Toronto, Winnipeg and Montreal, with Agencies in all the principal Cities. It is also the intention of the Company to form local companies to work the dry earth system in Cities and Towns not provided with, or not well adapted for, a good system of sewerage, in which the dry system affords altogether the best method of disposal of excreta. Mr. Heap, the Managing Director, will be pleased to correspond with municipal authorities, medical officers of health, and any gentlemen interested in the dry earth system. The readers of this JOURNAL need hardly be informed that it has always been a strong advocate of the dry system of excreta disposal, as being altogether the safest.

SULPHUR, in the form of sulphurous acid fumes, has long been regarded as one of the best disinfectants. In Homer's Odyssey, book xxii., where speaking of Ulysses, it is said:

With fire and sulphur, cure of noxious fumes,  
He purged the walls and blood-polluted rooms.

A PLAN for using the enormous water power of the Alps for working electric railways in Switzerland is about to take a definite shape.

### Miscellaneous.

BAKING POWDERS—There has been a great deal said and written within the last few years about baking powders. The use of large quantities of potash and soda salts is objectionable, because not essential to health, and most baking powders in the market contain much more objectionable ingredients than these. The following substances, thoroughly mixed, make any excellent baking powder, one which probably cannot be surpassed, in utility and simplicity, and as regards unobjectionable features. It is vastly less expensive, and less of it is required in baking than of most powders. Obtain the two principal ingredients from a reliable druggist or grocer and you will then know what you are using.

Potassa bitart, (Cream Tartar) ..	3 parts
Soda bicarbonate .....	15 "
Flour .....	5 "

AN UNUSUAL INSTANCE OF poisoning by illuminating gas is given by Dr. G. E. Bentzen, in the *Nordiskt Medicinskt Arkiv*. All the inmates of a house three stories in height, containing sixteen rooms and occupied by six families, suffered from the poisoning. There was no gas supply and not a single gas pipe in the house. There had been a break in the gas main in the street; from this the gas passed through several feet of earth into the cellar, and was thence diffused through the whole house in such quantity that every inmate suffered in nearly equal degree. This shows how readily emanations from the soil may pass into the different apartments of a dwelling.

WILFUL WASTE MAKES WOEFUL WANT.—Liebig, says Mayhew (*London Labor and London Poor*), contends that many an arid and desolate region in the East has been made desolate because men understood not the restoration which all nature demands for the land. He declares that those regions are now desolate because the inhabitants did not understand the art of restoring exhausted soil. It would be hopeless now to form, or attempt to form, the 'hanging gardens,' or to display the rich florescence 'round about Babylon,' to be seen when Alexander the Great died

in that city. The Tigris and Euphrates, before and after their junction, Liebig maintains, have carried, and to a circumscribed degree still carry, into the sea, 'a sufficient amount of manure for the reproduction of food for millions of human beings.' It is said that 'could that matter only be arrested in its progress, and converted into bread and wine, fruit and beef, mutton and wool, then cities might flourish once more in the desert, where men are now digging for the relics of primitive civilization and discovering the symbols of luxury and ease beneath the barren sand and sunburnt clay.

**THE QUEEN AS A SANITARIAN.**—At the first anniversary dinner of the Association of Sanitary Inspectors, held June 7th, in London, Mr. Edwin Chadwick, C. B., the President of the Association, occupied the chair, and in proposing the first toast said: Gentlemen, I propose the health of one who is regarded as the great and beloved lady-mother of the people of this great empire, our Sovereign the Queen; and I may take occasion to state the example she has set to her subjects of the exercise of the functions which are the subject of our Association. One of the first things the Queen did as soon as public affairs permitted, was to direct a close sanitary inspection of all the cottages on her own estate at Osborne, and attentive action on that inspection. I had the results sent to me, when it appeared that there was a sickness and death rate by one third less than the rates prevalent elsewhere. From that result I was enabled to declare that if her Majesty's example of proper sanitary inspection and action upon the inspection were generally followed, it would be for her subjects of the wage classes as if every third year there were a jubilee; and there were no sickness and no deaths. I ask you sanitary inspectors to drink reverently the health of her Majesty.

THREE SHRIMPS were recently found in the Toronto city water by Mr. H. A. Knowles, druggist, Yonge street.

WATER FROM HOT SPRINGS is now used, by being conveyed through pipes, to warm forcing beds for early vegetables:

## Publisher's Notices.

### VOLUME SEVEN.

With this number is commenced volume seven of the SANITARY JOURNAL, and already the JOURNAL had entered upon its eleventh year of publication. While many subscribers are good enough to pay up promptly in advance, a large number do not, and so do not enable the publisher to make the Journal as valuable as it might otherwise be. He will feel greatly obliged if these will kindly remit at an earlier day.

**SPECIAL.**—A large number to whom the JOURNAL has been sent during the past year the publisher has not yet heard from. Will they kindly remit the amount of subscription—\$1.50 if sent now at an early day. Please oblige.

**BACK NUMBERS MUCH WANTED.**—The publisher wants very much a few copies of number 6 of volume 3 of this JOURNAL. He will be very much obliged indeed if any one having such will communicate with him by post card or otherwise; cash or current numbers will be given in exchange.

FOR THE LATENESS of this number, the publisher desires to apologize. The printing is done outside this office, and sometimes all efforts, however great, to have this work done on time prove unavailing. All printers seem to be alike in this respect. It is a source of much regret to the publisher.

**COMPLAINTS** of not receiving the JOURNAL regularly have never been so numerous as within the last year and it never has been issued more regularly. The fault must be outside this office. We have reason to believe that local post offices are at fault. The mailing is done with particular care and over sight, and to every subscriber a copy is carefully addressed and mailed.

SEE OUR SPECIAL CLUBBING RATES on another page—turn over one leaf. An excellent opportunity to get current literature at lowest rates.

### Literary and Scientific.

UNDER THE TITLE of "Battles and Leaders of the civil war." *The Century* begins with the November number and will continue a series of separate papers, the object of which is to set forth, in a clear and graphic manner, the life and spirit of the most important of modern military conflicts—the War for the Union. The main portion of the scheme will be papers of a popular character on the great engagements of the war, by general officers high in command at the time, and in every instance a participant in the engagements under consideration. For instance, the battles of of Shiloh and Vicksburg will be described by General U. S. Grant; General Beauregard will write of the First Bull Run; General McClellan, of Antietam. A number of other prominent Confederate generals have engaged to contribute, and some of these contributions will be hardly less notable than those above mentioned. \*The illustrations of the scheme will receive the most careful attention, and in this particular it is thought that the series will possess an unequalled historical interest.

**PANACEA FOR TROUBLE.**—Life is filled with troubles as a writer in *Our Homes* has said, and we must shoulder our share with the best grace we can. We may only seek to make them as light as we can, since to avoid them is impossible. There is one sovereign panacea for this. It is work. Brooding over trouble is like surrounding one's self with a fog. It magnifies all objects seen through it. Occupation of the mind prevents this; hard work, manual work even, gives the mind other matters of concern, tires the body so that sleep will come. Very few suicides occur when men are actively employed. When out of work they think of their other troubles, and the despondency arising from this added one throws the mind from its balance, and the fatal deed is done. Many a man would have committed suicide if he had had the time. Work of any kind, especially work for others, is the great panacea for a trouble mind.

**No CATS.**—There is not a single cat within the limits of the town of Leadville, Colorado, according to the *Chicago Inter-Ocean*. Cats have been imported there by the hundreds, but not one survived the second week. Neither are there rats nor mice. The thin atmosphere at that altitude (10,200) is as fatal to the vermin as to their foe, and the inhabitants are thus mercifully spared the inflictions of both.

SINCE 1828 cholera has attacked four millions of Russians, and killed one million six hundred thousand.

**Co-OPERATION** gives strength, and co-operative societies of various kinds are becoming more and more common and valuable. Co-operative life insurance and aid in times of sickness is becoming more and more popular and it is believed by the most competent judges that such will be the system of the future. If properly managed, and looked after by the members of the different associations, it is the safest.

**LIFE INSURERS** usually pay more than twice as much annually as will cover the risk on their life, the surplus going to enrich stock companies. By far the cheapest, and certainly the safest, if properly managed, are co-operative companies or associations.

**INCOMBUSTIBLE PAPER** is stated to have been invented by a Mr. Meyers, of Paris, which, in addition to its power of resistance to extreme heat, has the merit of preserving its normal appearance under the action of fire.

**CITRIC ACID** is, according to the *Journal d'Hygiene* a most powerful disinfectant, preserving meat from putrefaction, and proving rapidly fatal to septic microbes.

**AN ALASKA U. S. Signal Corps** observer writes of the discovery of a wonderful medicinal spring in that Territory, long highly esteemed by the Indians and greatly valued by the few whites who know of it.

**A MACHINE FOR PRODUCING RAIN** is among the last inventions, reported from Australia. It is in the form of a balloon with a charge of dynamite attached underneath it. The balloon is to be fired by a wire connecting it with the earth.

**THE FIRST CABLE tramway** laid in Europe has been opened on a steep piece of road near London, Highgate Hill, and is pronounced a complete success.

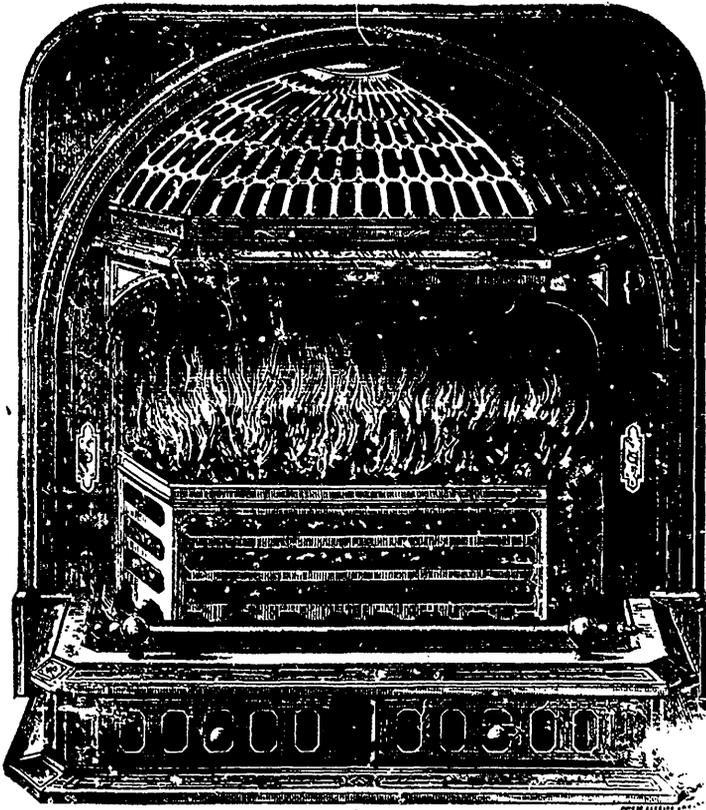
IT IS SUGGESTED that the present be called the 'steel age' instead of the "iron age".

IN A PAPER is this advertisement: 'Two sisters want washing.' Thousands of brothers are in the same predicament.

**CONSOLATION.**—If you live in a city don't cry over spilled milk. Examine it closely and you may find it is not milk, after all.

"Ever had a cyclone here?" asked a Kansas man who was visiting a country aunt in the east. "A cyclone? Oh, yes," said his aunt. "Deacon Brown's son brought one from Boston a spell ago, but law! he couldn't ride it. Tumbled off every time he tried."

The prospectus of an electric sweat band for men's hats declares that "it stimulates the imagination, strengthens the memory and greatly augments the working power of the brain."



## FIRE ON THE HEARTH STOVES

(6 Sizes.)

AIR WARMING GRATES. FIRE PLACE HEATER.

(2 Sizes).

(2 Sizes).

SCHOOL ROOM HEATER DOUBLE HEATER.

### WARMING AND VENTILATION.

Each article combining the radiation and ventilation of an open fire, with the power and economy of a warm air furnace.

Recommended by the highest sanitary and practical authorities in the land.

Send for description to the

OPEN STOVE VENTILATING Co.

76 BEEKMAN St., New York City.

# BALL'S HEALTH PRESERVING



## A PERFECT CORSET SECURED AT LAST.

A combination of COILED WIRE SPRINGS, Whalebone and Corset Jean, which is pronounced by our best Physicians less injurious to the wearer than any other Corset made.

Fits perfectly a greater variety of forms than any other.

Yields readily to every respiration and is equally comfortable in any position assumed by the wearer.

Warranted to retain its perfect shape till worn out. By it you secure a more graceful figure than with any other corset. Please give it a single trial and you will wear no other.

### What Eminent Chicago Physicians say of it.

CHICAGO, October 23, 1880.

I have examined BALL'S HEALTH PRESERVING CORSET and believe that it is in every respect best calculated to preserve the health of the women who wear it.

It does not seem to be possible for the wearer of such a corset to be injured by tight lacing. It should receive the favorable endorsement of the Physicians who have the opportunity of examining it.

JAMES NEVENS HYDE.

CHICAGO, October 13, 1880.

I have examined BALL'S HEALTH PRESERVING CORSET, and believe it to be the least injurious to the wearer of any Corset I have seen.

A. J. BAXTER, M. D.

CHICAGO, October 11, 1880.

I do not advise any woman to wear a Corset, but if she will do so—and she generally will—I advise her to use one of BALL'S HEALTH PRESERVING CORSETS, as it is less likely to do her injury than any with which I am acquainted.

A. REEVES JACKSON.

PRICE BY MAIL, PREPAID, \$1.75.

For Sale and Manufactured by

**Clinton E. Brush & Bro.,**

33 FRONT ST. WEST, TORONTO.

IN ASSUNCIÓN, Paraguay, there are no deep sewers. The excreta mingled with the ashes is collected in pails, the whole being removed weekly by scavengers. The slop-water flows by open channels into a gutter in the center of the road.

DR. JANEWAY relates the case of a physician in New Mexico, who, after having attended a scarlet fever patient, went to see a patient in a town twenty miles distant, in which, as he subsequently took special pains to inquire, there was no scarlet fever; yet, one week after his visit, the disease appeared in the family which he had gone to see. Similar instances of carrying contagion long distances have been reported in the *Practitioner*, by physicians in rural districts in England.

## INTERCOLONIAL RAILWAY.

THE DIRECT ROUTE FROM THE WEST

FOR ALL POINTS IN

New Brunswick, Nova Scotia, Cape Breton  
AND NEWFOUNDLAND.

All the popular sea bathing, fishing and pleasure resorts of Canada are along this line.

Pullman cars leaving Montreal on Monday, Wednesday and Friday run through to Halifax and on Tuesday Thursday and Saturday to St. John N. B. without change.

Close connections made at Pointe Levis or Chaudiere Junction with the Grand Trunk Railway and at Pointe Levis with the Richelieu and Ontario Navigation Company's Steamers from Montreal.

Elegant first class, Pullman and smoking cars on all through trains.

First class refreshment rooms at convenient distances.

### Importers and Exporters.

will find it advantageous to use this route, as it is the quickest in point of time, and the rates are as low as by any other. Through Freight is forwarded by fast special trains, and experience has proved the Intercolonial route to be the quickest for European freight to and from all points in Canada and Western States.

Tickets may be obtained and also information about the route and about freight and passenger rates from

E. KING, Ticket Agent,

OTTAWA.

ROBERT B. MOODIE,

Western Freight and Passenger Agent,

93 Rossin House Block, York St., Toronto.

D. POTTINGER,

Chief Superintendent.

Railway Office, Moncton N. B. May 28th, 1884.