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VOL. II. JUNE, 1876. No. 6.

THE SANITARY JOURNAL.

DEVOTED TO

Public Health and Preventive Medicine.

EDITED BY

EDWARD PLAYTER, M.D.

SALUS POPULI SUPREMA EST LEX.

CONTENTS.

PUBLISHED MONTHLY,

Terms: Two Dollars Per Annum in Advance.

Two Copies, 1 Year, $3.50; Three Copies, 1 Year, $5.00.

Single Copy, Twenty Cents.

Address SANITARY JOURNAL, TORONTO.

DUDLEY & BURNS, PRINTERS, No. 11 COLBORNE STREET.

THE

SANITARY JOURNAL.

DEVOTED TO

PUBLIC HEALTH.

VOL. II.] JUNE, 1876. [No. 6.

Original Communications.

OZONE.

BY AN AMATEUR IN METEROLOGY.

To the physician, as well as to the chemist and meterologist, there is probably no subject more interesting than that of Ozone; while it is one of much importance, as it largely concerns the health.

THE HISTORY of Ozone is exceedingly attractive. It has long been known that a peculiar odor is sometimes perceptible during thunder-storms, and it is believed that this is identical with that of Ozone. For many centuries the common people have believed that flashes of lightning are always followed by the diffusion in the air of an odor resembling sulphur or gunpowder. The Ancients appear to have observed the same odor in connection with flashes of lightning, called "thunderbolts." Jupiter, it is said (Hom. *Odys*) struck a ship with a "thunder-bolt, full of sulphurous odour." Ajax hurls a rock at Hector, who falls like a "mountain oak struck by lightning, which lies uprooted, and from which the fearful smell of smoking sulphur rises." *(Iliad.)*

The discovery of "vital air" or oxygen, by Priestly in the last century was followed by many experiments on this gas. Van Marrum of Holland, after passing electric sparks through it observed that it possessed a peculiar smell. At the commencement of the present century, Cavallo observed that this

"electrified air" had a purifying effect on decomposing vegetable and animal matter, and he employed it as a disinfectant to fœtid ulcers. Later, Dr. John Davy recognised this principle in the atmosphere, and arranged a formula for the preparation of chemical tests to be employed in detecting it. A few years later, Schonbein, Professor of chemistry at Balse, drew the attention of scientists to remarkable properties of this substance, to which he gave the name it bears, Ozone, from the Greek word, signifying to smell or emit an odor.

Schonbein showed that it was a substance possessing the property of entering most readily, like Oxygen, into chemical combination, and also that the odor emitted by the electrical machine when in action was due to it, and not, as had been supposed, to the peculiar action of electricity on the olfactory nerves. He proved that it could be produced without the aid of electricity. He found the gas was contained in the oxygen evolved at the positive pole during the decomposition of water by the voltaic pile. And he believed that oxygen could be split up or transformed—half into oxygen in a negatively polar state, or Ozone, and half into oxygen in a positively polar condition, r Antozone, which I may make the subject of a future paper.

The theory that Ozone is allotropic or condensed oxygen is now most universally believed. Professor Tyndall thinks that ozone is an aggregation of atoms of oxygen into molecules.

"If the difference between ozone and its parent oxygen are great," says Dr. Fox.* "They are not more if so striking, as are those between the three allotropic modifications of Carbon—viz. lamp-black, graphite or plumbago, and the diamond—or as the widely-dissimilar forms of vitreous and red Phosphorus, the former, when dry, igniting at the temperature of a summer's day, whilst its brick-red modification can be carried with safety in the waistcoat pocket. Draper of New York has shown that Chlorine, a gas which bears the closest analogy with Ozone, on account of the powerful bleaching, disinfecting, deodorizing, and other powers common to both, may exist in an active and passive condition. In the former state it would appear to possess all its well-known properties, and in the latter even its most energetic affinities disappear. As Ozone, then, is an active allotropic form of Oxygen, so Chlorine would seem to be an active allotropic condition of passive Chlorine.

"Thanks to the researches of Andrews, Tait, and Soret, a reply to the question with which this chapter commences—"What is Ozone?"—can now be given with confidence. Our present knowledge enables us to conclude that Ozone is simply a con-

* Ozone and Antozone, their History, &c. Cor. B. Fox, M.D., &c., &c.

densed or allotropic form of Oxygen, and that they are mutually convertible, the one into the other, without the production of any other body."

OZONE MAY BE PRODUCED in many ways, though not in a pure and isolated form. Many apparatuses have been constructed for producing it by passing electric sparks through oxygen or atmospheric air. But the formation of ozone by electricity is expensive.

A simple process for generating ozone, Bettger's was given in the SANITARY JOURNAL for April.

Lender recommends the use of a powder consisting of equal parts of peroxide of manganese, permanganate of potash and oxalic acid. When diluted with water, ozone is quickly generated.

By the slow oxidation from exposure to air and light of certain ethers and volatile and resin oils, turpentine, linseed, bergamot and most essential oils, ozone is produced.

REGARDING THE PROPERTIES of ozone: It acts powerfully on most substances as an oxidizing agent. Silver, mercury, tin, arsenic and such like metals are oxidized by it. According to Schonbein nitrites are changed into nitrates by ozone only. The property it possesses of destroying most organic substances is remarkable. Its bleaching power is greater than that of chlorine. Experiments of Schorbein and others show that wood, straw, vegetable colors, albumen, starch, caoutchouc, etc., are oxidised by this agent, while it possesses the power of destroying by oxidation the gaseous and other exhalations resulting from the decomposition of organic matter.

The following experiments of Drs. Wood and Richardson forcibly illustrates the deodorizing and purifying powers of Ozone.

"In 1854, a pint of the blood of an ox coagulated was exposed to the air until it was quite putrid, and the clot was softening. At the close of the year, the clot having redissolved as a result of alkaline decomposition, the blood was a most offensive fluid. In 1862, the fluid was found to be so offensive as to produce nausea when the gases evolved from it were inhaled. Drs. Wood and Richardson subjected it to a current of Ozone from Siemens' apparatus. Gradually the offensive smell passed away, and the fluid mass became quite sweet. The dead blood, moreover, coagulated as the products of decomposition were removed, and this so perfectly, that the new clot exuded serum."

The following table by Houzeau shows the chief differences between the properties of Ozone and Oxygen:

Properties of Oxygen in a Free State at the temperature of 59° F.	Properties of Ozone in a Free State at the temperature of 59° F.
A colorless and tasteless gas.	A colourless gas possessing a powerful odour and a flavour of lobsters
Without action on blue litmus.	Decolorizes blue litmus.
" India rubber	Corrodes India rubber
Does not oxodize silver	Oxidizes silver.
Does not decompose Potassium Iodide.	Rapidly acts on Potassium Iodide and places Iodine at liberty.
Without action on Ammonia.	Consumes instantaneously Ammonia, transforming it into the Nitrate.
Without action on Phosphuretted Hydrogen	Combines immediately with Phosphuretted Hydrogen, with emmission of light.
Does not react on Hydrochloric Acid.	Decomposes Hydrochloric Acid, liberating its Chlorine.
A feeble oxidizing agent	A powerful oxidizing agent, and an energetic bleacher.
Very stable at all temperatures.	Destroyed at high temperatures

[To be continued.]

A LECTURE ON INDIVIDUAL HYGIENE.

By Reginald Southey, M.D., F.R.C.P., Physician to, and Lecturer on, Forensic Medicine and Hygiene at St. Bartholomew's Hospital.—From the *Lancet*.

It is a far more easy thing to ascertain the health-rate of a town or population than that of an individual. The inference follows, then directly upon established facts. Death rates; mean death age; mortality at different periods of life; return of sickness. But from what date will you appoint an individual health-rate? What standard are we to set up? Are we all agreed upon an ideal health as something separate from a reliable measure of health?—since this last is what we must rest content with. The scale of health can only be graduated by degrees of disease, or degrees of immunity from disease.

Health and longevity are not synonymous, neither are health and great muscularity. The most muscular men, great prize-fighters, men who could fell an ox with their fists, have been known to be always ailing and complaining about themselves. The state of perfect training, regarded by those who know little

of it as a condition of most perfect health, is rather one of morbid imminence.

Longevity, like height, is a race attribute, but it does not signify health. The three oldest people I ever knew, women who reached respectively eighty-nine, ninety-eight, and a hundred, were valetudinarians, and had been so nearly all their lives.

I wish you to perceive that while a great deal of sickness may be compatible with long life, and a huge amount of disease is preventable and quite unnecessary, there must still always remain a fair quantity of illness which has to be accepted as the allotment of the sons of Adam, which will lay a man by for some few days in every year of his life, which will confine him to house or bed now and then as he advances in years, and which he can neither prevent by any care he takes of himself nor avoid by following the guidance of the very best Æsculapius.

The conditions under which life is held make it a tenancy, not a freehold.

But we may profitably occupy ourselves in scrutinising men like machines, and noting what is good and what bad in construction, what kind of build of body is adapted to fulfil good mental and bodily work, to endure long, and waste very little if treated fairly.

Insurance offices mean by average healthy lives, persons who at the date of their examination show no sign of disease, and the history of whose past lives, as well as that of their families, exhibits no proclivity to early death.

When Government advertises for smart young men for active service, it is understood to require persons who can endure fatigue and stand ordinary exposure without breaking down.

The hygienist defines health as a comparative exemption from disease at each period of life; he regards it as an abstract quality of the body, just as virtue is of the mind, arising out of a perfect adjustment of the several component parts towards the requirements of the whole.

If this be allowed, let us next inquire how we are to discover and appoint this quality of body. What form or appearance of man is most likely to possess it? Will he be a *bel homme*, or a Hercules, with broad shoulders, short thick neck, and small round head? Be an Apollo or an Adonis? If a woman, will she be exquisitely proportioned like the Venus or Praxitcles? It is at least probable that such an exterior as artists and sculptors admire will coincide with health, for beauty in form usually accompanies the adaptation of means to ends, parts to purposes; but if you understand health to be comparative im-

munity from disease, and a disposition to resist it, you must not expect this endowment will find immediate or precise expression in either form or feature. Nay, I shall go further, and say that disease is so subtle a thing that you cannot estimate any individual's health at a mere glance. You may make a guess, and perhaps a shrewd guess, if you have had experience of disease, and some practice in examining persons. But unless you have learnt what to look for and how to examine, your opinion upon any individual's health, present or prospective, will not be valuable. My object to-day is to teach you how to make it so.

The ideal of health is, after all, nearly what common sense teaches us it should be—a body that functions (as the Americans phrase it) well and unconsciously, and possesses recuperative powers in store.

The following are the chief things to be noticed in estimating *the construction of any person's body* :—The age, the weight, height, and girth of chest, have all to be taken into account. They bear a certain definite ratio to each other in well constructed bodies.

You should estimate the girth at two different levels: first round the mammæ, the tape passing just above the level of the nipples; and, secondly, at the level of the xiphoid cartilage. The upper girth should exceed the lower.

The next thing to ascertain is the mobility of the chest. Mere girth will not give you what you seek to know, which is the amount of air ordinarily changed at each respiratory act, and the maximum mobility, or the greatest amount which can be changed. For instance, a 30-inch chest-girth which expands only two inches, to 32, after deepest inspiration, is capable of changing less air than one measuring 29 inches and expanding to 33 inches. Hutchinson found that the thorax presented the greatest capacity in men whose height ranged between 5 feet 6 and 5 feet 8 inches; and that it was relatively smaller in men measuring between 5 feet 8 and 5 feet 10 inches.

Again, above the weight of 11½ stone (= 161 pounds), the circumference of a man's chest ought to increase about 1 inch for every 10 lb. in weight, and for every inch in height over 5 feet 8 inches the mobility of the chest should increase in definite ratio.

What Hutchinson called the vital capacity, and estimated by his spirometer, a floating cylinder which was raised from its bed like a small gas meter, by being filled with air from the mouth, is the fullest measure of air a man can expire after the deepest inspiration. It is not so valuable a test as it ought to be because there is a good deal of knack required in blowing to

one's bellows power. I do not intend to occupy your time with a lecture upon the examination of the chest, however. I only desire to call your attention to the data requisite for arriving at an opinion upon the probable health of any individual.

Take (1st) as items of unfavourable augury, a weight at all below the average, which should correspond with the height—important in the degree in which it is constant; (2nd) a thoracic girth not commensurate with the weight; (3rd) any chest girth in an adult less than twenty-eight inches: (4th) a thoracic mobility between deepest inspiration and fullest expiration measuring less than three inches.

But it is not merely by stripping, weighing, and measuring a man that you estimate what he is worth—you must make him quicken his circulation, and then examine his heart and pulse and auscult his chest: you must feel over the heart and large vessels for impulse and thrills; a certain amount of pressure should be borne over the heart and chest without interfering with the heart's action; its rhythm should be regular, its impulse not excessive, its sounds distinct and clear. There are many other things you must notice as well—the shape of the abdomen, which ought not to be prominent, the limits of liver and spleen, the hernial sites, the general formation of spine and chest and feet, varicocele and piles, obesity and leanness. There are features about a pulse you have to value: one that is succinct, firm, and regular, rendered fuller by feeding, thinner by fasting, altered in rapidity by posture; but, however quickened that should always be distinct. Temperature, too, appoints a great deal; while high temperatures suggest the febrile state, low temperatures often signify existing thoracic disease or a feeble state of health. I have observed that the subjects of chronic peritonitis, of brain-softening, of diabetes, and of renal disease, usually present temperatures below normal.

Again, the stability of the axillary temperature, when a person is exposed to circumstances which tend to depress it, such as resting one foot upon a block of ice—the test, if you remember, which Black applied in selecting sailors for an Arctic voyage—would be a valuable criterion of both a sound circulation and a good nervous system.

Lastly, you should practice yourselves in estimating the mental as well as the bodily health; for, as the Latin Grammar taught you, the *mens sana* is only found in *corpore sano*.

In summary, let me repeat that a sound constitution depends upon a body well constructed both inside and out, and upon a balance of functions, circulation, respiration, innervation, digestion, sanguification, each well, all unconsciously fulfilled; upon a temperature well maintained all the body over; and last, but

by no means least, upon good habits of life. A man, as Celsus, said, is not to live too much by rule; he should be the master not the slave of his body.

The state of health is a state of very perfect hæmatosis, in which the tissues of the body are neither too moist nor too dry. Flabby muscles and hydræmia of the intercellular tissue are suggestive of debility if not of actual disease. There appears to be a maximum of solidity, a ratio between weight, height and girth, which coincides with that period of life when the energy or vigor is greatest, when each individual is capable of his greatest feats of strength and endurance: it is better marked in males than in females, and happens at or about the thirtieth year of life. This is the quality of body which the hygienist aims at prolonging.

The following signs may be accepted as evidences of sound health:—1. Individual adaptability: the capacity in man to adapt himself to extremely opposite conditions of existence without suffering in energy. 2. Endurance: the capacity of supporting considerable bodily or mental labor without suffering from fatigue, or of repairing the latter quickly. 3. Self-command: the capacity of controlling the emotions, blunting as well as sharpening the sensations at will. 4. Resistance to morbid influences: the capacity of eliminating all poisons quickly by dint of sound organs of excretion.

The following signs of debility ought to be enumerated as well:—1. Deformity; obesity; leanness; bad construction of the skeleton or of its clothing. 2. Personal inadaptability: liability to disturbance of either mind or body upon slight provocation, such as change of food, clothing, climate, or any interruption of the ordinary habits. 3. Lack of endurance; small staying powers, requiring long rest to repair fatigue. 4. Small emotional control: the persons who are quickly provoked to anger, or are speedily moved to tears or laughter, exhibit feeble nervous systems, and are prone to nervous disorders. 5. Proclivity to morbid influences: those whose organs of sanguification or of elimination are damaged; who, although equal to ordinary calls upon them, exhibit their inefficiency by succumbing to every contagion, miasma, or poisonous influence that they encounter.

INTEMPERANCE IN AMERICA.—Dr. De Marmon, in the *New York Medical Journal*, says: 'For the last ten years the use of spirits has, 1. Imposed upon the nation a direct expense of 600,000,000 dols., 2. Has caused an indirect expense of 700,000,000 dols.; 3. Has destroyed 300,000 lives; 4. Has sent

100,000 children to the poorhouse; 5. Has committed at least 150,000 people to prisons and workhouses; 6. Has determined at least 1,000 suicides; 7. Has caused the loss, by fire or violence, of at least 10,000,000 dols. worth of property; 8. Has made 200,000 widows, and 1,000,000 orphans.'—*Sanitary Record.*

FASHION AND ITS PENALTIES.

By Washington L. Atlee, M. D. Annual Address before the Medical Society of the State of Pennsylvania.—From the *Sanitarian.*

Gynæcology (the diseases peculiar to women), as a branch of study, was scarcely known half a century ago. The vast discoveries made in uterine pathology, and the advance in the treatment of the diseases of females, even in the life-time of many of us, are beyond estimate. A large majority of the members of the Society can well appreciate the extent of this progress. Old Physic, if he has kept pace with the course of events, will acknowledge that in the early part of his professional career he knew little or nothing, comparatively, of the proper treatment of such diseases. He can look back and call to mind scores of patients who went down into the grave without relief, and who could have been saved had he possessed that knowledge which the profession now claims. The proportion of female diseases, however, was no doubt much less in the earlier part of the century than it is now, because the habits of the people were much more simple and healthful than in the present day. Ladies then occupied the good old-style one and two story houses, well ventilated by wood-fires on open hearths; wore six yards of material for a dress; supported their garments by suspenders upon their shoulders; did not constrict their bodies below the waist to the smallest possible wasp-like dimensions, but allowed their lungs to expand in the normal direction; wore low-heeled shoes to enable them to walk erect, and threw the centre of gravity on to the spinal column, where it properly belongs; walked and lived much in the open air; rode on horseback instead of going in carriages, which are a modern luxury; retired early to bed and arose therefore early; did not revel most of the night in over-heated, crowded, and badly-ventilated rooms, nor slumber away the whole of next morning in their close chambers, while the balmy fresh air outside was inviting them to its embrace. Age may have blunted my sensibilities and clouded my judgment, but I remember that, in the ardour of my youth, I admired the girl of that day as eminently healthful, rosy, buxom, and

beautiful; and no doubt Thomson had the same lovely object in view when he wrote:—

> "A native grace
> Sat fair proportion'd on her polished limbs,
> Veil'd in a simple robe, their best attire,
> Beyond the pomp of dress; for loveliness
> Needs not the foreign aid for ornament,
> But is, when unadorn'd, adorn'd the most."

But as time has advanced customs have become different, and in proportion as they have departed from simplicity have the infirmities of women increased. Our dwellings have risen to three, four and even five stories, and in like proportion have dress-patterns augmented. The amount of dry goods required to furnish one dress now would have sufficed to clothe four or five of our good mothers when they were young women. How can we explain this singular phenomenon? Have the dimensions of our lovely sisters quadrupled, or has that remorseless goddess Fashion imposed upon the tender frame this immense weight? Look at that interesting, delicate girl, pallid and wan, struggling wearily under a weight of clothing which the strongest of our sex would not tolerate; all suspended, not upon her shoulders, but upon her necessarily constricted waist.

Let us glance for a moment at the pathology of these dogmas of fashion. Examine a lady in full dress thus poised: high heels, and a constricted waist supporting from ten to thirty pounds of merchandise? She cannot, if she would, maintain a perfectly erect position. Look at her figure: her heels are tilted up, she is partly on tiptoe; the feet, head, and shoulders are thrown forward and the hips must necessarily take an opposite direction to maintain the proper equilibrium. Why, this is a caricature, a burlesque on female beauty! But when she stands forth as God hath made her—erect in her fine proportions, with her fully, finely chiseled bust; her ample waist responding naturally to every inspiration; animated by the glow of vigorous health; and clothed so as not to clog any vital function, nor hide every grace; and walks forth, as only she can walk who practically recognises the physiology of the foot; she carries herself with true majesty; she is "a thing of beauty and a joy for ever," and we bow down in adoration to the most beautiful object in creation. Drop the plummet from her fair forehead, and the line is parallel with the axis of her body, while in the other case, it falls anterior to the body, resembling the string when taut on its bow, and forms the hypothenuse of an obtuse triangle. Surely, the Venus de Medici was never chiseled from such a model!

"Old as I am, for ladies' love unfit,
The power of beauty I remember yet."—DRYDEN.

But this is not all. Beauty and health are twin sisters. Examine these two beings under another aspect. Place your line on the mastoid process of the one, and the plummet, as it should do, will strictly indicate the axis of the spinal column, and strike the malleolus. This, therefore, is the centre of gravity, and its force does not impinge upon a single vital organ. Make the same experiment with the other. The line of gravity will be very different; it leaves the vertebral axis and passes through the organs of the chest, the viscera of the abdomen, and impinges upon the pelvic organs. Add to this a waist contracted and rigidly fixed. Now what must be the result? The upper wall of the thorax being an unyielding cone, and its lower border rendered incapable of expansion, the only compensation must be in the direction of the least resistance. We all know where that is. There are from twenty to forty inspirations every minute during every day of our existence, and in such a faulty attitude of the body the diaphragm is driven down by each inspiration, in the line of the centre of gravity, like the piston-rod of a pump, forcing every organ below it more or less out of place. All violent and unusual exertions of the body also act in the same direction.

Is it any wonder, therefore, that the diseases peculiar to females should have increased to so an alarming extent? And is it strange that, with all these counteracting causes, we should find these ills so difficult of cure, and, when cured, so apt to return? It is fortunate for women, amidst the follies of dress and the foibles of fashionable society, that pathology and treatment have made so much progress in uterine troubles. Were we not in advance of the knowledge of old physic, and did we possess no better means of combating the destructive influences of the times, our households would become female hospitals, and the treatment of such diseases would be an opprobrium to medicine. But to do the best we can, this "patched-up" existence is but a poor substitute for that buoyancy of health and spirits which is the natural birthright of the majority of women.

I have often said to my lady patients privately, and gentlemen, I say it to you publicly, that if the ladies of this country, instead of being travestied by milliners and mantua-makers, and enslaved by every change in the tide of fashion, would, before adopting them submit their costumes to a committee of medical men, or better, of medical women, they would be infinitely more comfortable, would enjoy better health, more

satisfactorily fulfill the duties of maternity and of marital life, and meet the requirement of every domestic and social position. We certainly would recommend no more clothing than could be carried with ease and comfort; we would suspend all garments from the shoulders; we would not constrict the most important part of the body, making that portion of the chest which is naturally the most expansive a contracted, immovable *point d'appui* for every inspiration to drive down and displace the vital organ; we would have the shoe to fit the foot, not forcibly adapt the foot to the shoe; we would order the heels to be low and broad, and placed where the Almighty designed them, we would discard furs from the neck and shoulders for common use, reserving them for extraordinary occasions, and veto the use of unwieldly masses of false hair —as these portions of the body are so near the centre of circulation as to have their heat well maintained: in short, in adopting any style of dress we would do no violence to the laws of physiology and hygiene. This could always be accomplished in perfect harmony with good taste. The health of women, which is so intimately associated with the beauty, welfare, and happiness of the whole human race, is too valuable to be sacrificed to the blind and indiscriminating tyranny of fashion.

In these remarks I mean no offensive criticism on the manners and customs of the day. I am incapable of this. As physicians, we should be the conservators of public health; and we have no legitimate right to be counted in the profession, if, through any mercenary or other unworthy motive, we fail to promote it in every possible way.

Growing out of the debility and ill-health to which our female patients are so often the victims, is the resort to tonics, stimulants, nervines and opiates, the former to maintain their strength, and the latter to quiet their nerves. This, I regret to say, is not sufficiently discountenanced by the profession, and often degenerates into a habit which entails a life-time of misery and distress. Tonics and stimulants can rarely, of themselves, add tone and strength to the animal system, and to regard them as nutrients, and to employ them with that view, is, to say the least, a most hazardous proceeding. There are times when they may be employed to advantage, but I apprehend that the cases requiring them are comparatively rare. Permanent strength is the result of molecular nutrition. And true nutrition is the effect of the assimilation and appropriation of wholesome food supplied to the stomach, mingled with and elaborated by pure air inhaled by the lungs, and then subjected to the recuperative and depurative processes throughout the whole body—while the great pendulum, required to

keep this machinery in healthful action, is exercise both of body and mind. The functions of life require both motion and rest to maintain them in a normal condition. Constant activity will destroy them by wear and tear, while uninterrupted inertia will sooner or later paralyse vital force. Bandage the arm in an immovable splint, and in six or eight weeks endeavour to exert its muscular power. It is gone. As with the muscular system, so with the health of all other anatomical divisions of the body—exercise, in due proportion, is essential. If, then, our American ladies would depend upon exercise in the open air, conjoined with simple habits, non-luxurious living and cheerful company, more than upon tonics and stimulants, they would soon secure that vigorous state of health that would enable them, by an effort of the will, to discard that other vice of using nervines and opiates for every trifling irregularity of the nervous system. It would be cruel to deny to the suffering some mild sedative, yet the constant dependence upon such agents is weakening and demoralising, and lowers the mind from that supreme influence over the body which is its rightful dignity. Besides, there is a terrible responsibility associated with these habits on the part of mothers, which can scarcely be estimated. You will understand this when I announce the words of a prominent London physician, who says: "*The babies of London are always intoxicated, from the time they are born until they are weaned.*" How far this will apply to the little innocents of America I will not pretend to say; but the enormity of the practice, if such exist, may be estimated by a reference to the Decalogue, which tells us that the iniquity of the parent shall be visited upon the children unto the third and fourth generation.

INFANT DIET.

A CURSORY VIEW OF THE SUBJECT.

By J. H. Hobart Burge, M.D, Surgeon to L. I. College Hospital, Consulting Physician to Sheltering Arms Nursery, etc., Brooklyn.—From the *Sanitarian*.

Mal-nutrition is so prominent a feature in the fatal diseases of children two years old and under, that we cannot over-estimate the importance of the subject, particularly when we consider the fearful contributions which these little ones make to the death record everywhere. The vice which underlies it may exist in the quantity or quality of the aliment upon which the individual depends, or it may belong to one or more

of the processes which go to make up the complex process which we call digestion. Mal-nutrition may belong to any period of intra or extra-uterine life. Children may be born dyspeptic and in the strictest sense of that word destined to find digestion difficult, no matter what we put in their stomachs. It has surprised me to note how many of the newly born have some degree of constriction or approach to an imperforate condition in some portion of the alimentary canal. Besides the cases of imperforate anus which are met with in the practice of almost every one of large experience, we have a much larger number in which it is exceedingly difficult to obtain a free evacuation of the meconium, and I recall one case in which death occurred when the child was one week old. Post mortem examination revealed that from the pylorus to the upper end of the rectum the intestine was a mere cord, entirely imperforate. This seems like drifting away from the subject of infant diet, but I wish to note just here that although in a vast majority of cases of indigestion and mal-nutrition of infants, the one thing needful is to regulate the diet, yet in a considerable number of cases there will be found a disability to digest anything; and since this disability may be organic and incurable, or simple and temporary, it becomes us to be vigilant that we may not fail to discover the true condition and apply the proper remedy in all remediable cases For example: from an infant too weak to digest or even retain food of any kind—withhold a gentle stimulant and it will die; give the needful remedy and it may be saved. Another illustration is found in a babe suffering from malaria. Two to five grains of quinine given daily by inunction may enable the patient to thrive upon the same diet which immediately before seemed unsuitable. In this case a change of food might produce irreparable injury. It is then only by remembering that each case constitutes a study by itself that we shall avoid on the one hand the error of those who try to relieve all by medication, and on the other of those who imagine that a change of diet is the only thing to be thought of. In the hurry of medical practice there is no class of cases in which a "snap judgment" is more dangerous.

As a rule the young of any mammal is best nourished by the milk of its own mother. The exceptions to this rule are, however, so many that it is not the simple truism which at first glance it may seem. It occasionally happens that the apparently healthy milk of an apparently healthy mother will disagree with her child, and that the child will thrive better upon the milk of another person. Thousands of children are deprived of the maternal breast by the mother's death; by severe

illness; by accident; by mammary abscess; by sore nipples; by forced separation and by voluntary desertion. The attempt to substitute anything else for the mother's milk where no real necessity exists, is a meanness for which I have great contempt. But what shall we do with the children who for any reason whatever are deprived of this fountain of life? Perhaps before the physician is called to advise, the mother gives cow's milk, and soon finds that the excess of casein and the other marked differences between it and human milk make the child sick. She then substitutes rice-water, cracker-water, gum arabic, Iceland moss, gelatine, gruel made of fine wheat flour, Papoma, or some other substance equally incapable of supporting life. She now appeals to the physician with all the eloquence of maternal anxiety: "How shall I nourish my child? he is sick unto death for want of a suitable diet." It is easy to say "get a wet-nurse," but it is not so easy to do it. When it can be done with good prospect of success, 'twere folly to try anything else first. It is without doubt the next best thing to the mother's own breast, when just the right woman in just the right condition stands right there waiting for the babe to be transferred to her arms. But the difficulties are so many and so great, and arise so at every period of the experiment, that I venture to say it is an expedient that will oftener fail than succeed.

Some of the points involved are these—

1. The nurse must be in good health.
2. She must have no taint of scrofula, or syphilis, or cancer, or insanity.
3. She must be temperate.
4. She must be of good disposition—not passionate or ill-tempered.
5. She must be honest enough to nurse the baby till the proper time of weaning, without a perpetual threat to leave her post of duty unless you accede to the most unreasonable demands upon your purse, or still more unreasonable demands in reference to household affairs with which she has no possible right to meddle.
6. She must have moral principle and common-sense enough not to dose the baby "on the sly" with Winslow's soothing syrup, paregoric or gin, in order to gain time for her own purposes.
7. In case the natural supply prove insufficient, she must be too conscientious to deceive her employer by any artificial feeding whatever.
8. She must not be too old or too young.
9. Her breast must have been secreting for a period but lit-

tle longer than the life of the child for whom her services are sought.

10. She must not be pregnant.

11. She is presumed to be virtuous.

12. If a widow, she is morally bound not to marry till the period of service terminates.

13. It is necessary to the best condition of health, and therefore essential to the foster mother, that she should not only be resigned to her station, but cheerful and happy. Recollect, then, that wet-nurses are generally in deep affliction by the loss of their own offspring, or so wretchedly impecunious as to be willing to rob their babes of the nutriment which nature has supplied, and become hirelings to keep themselves from starvation, beggary or vice. Will you risk it? Sometimes it is worth while; generally it is not.

Next comes the inquiry, How shall we feed the infant when no human breast can be relied upon? Naturally we turn to the milk of the lower animals, and by preference to that of the cow as the most convenient substitute, and perhaps the nearest approach to the child's proper aliment of all that can be found ready prepared in the laboratory of nature. Good as it is, however—for many children have taken nothing else from birth till the end of the first year, and have been among the healthiest of their race—its use is obviously inferior to mother's milk in very many respects. Some of which are these—

1. A child draws milk from the maternal breast blood-warm and freshly secreted. Cow's milk is either taken cold into the delicate stomach of the infant, or it has been cooled and re-warmed, and I submit that so delicate an article as milk cannot undergo such a process—no matter how carefully conducted—without effecting a marked change in even its sensible qualities.

2. The substitute has an excess of casein amounting to 26 parts in 1000, and

3. An excess of butter amounting to only 18 parts in 1000, thus altering the relative proportions in such a way that no diluting with water can possibly bring them to the standard of human milk.

4. By standing, the cream becomes separated, and by no process can it be again uniformly distributed through the milk which is now essentially skimmed.

5. By transportation it becomes partially churned and is "buttery;" the oil globules having become agglutinated. So true is this, that you can tell by the olfactory sense which of two cans of milk has ridden ten miles and which a hundred.

6. It is often so adulterated with water, that children get no

more nourishment in a quart than a pint should furnish, and many infants have been slowly starved while their unsuspecting mothers have thought the quantity taken all-sufficient.

8. The water added by the dishonest dealer is not always as pure as Croton or Ridgewood—it may be more convenient and less liable to excite remark for the milkman to get the proper quantity from some pond in the vicinity of his dairy, or from a well in his barnyard. That intestinal irritation, vomiting, diarrhœa, dysentry and typhoid fever are often due to such sources has been abundantly proven.

9. Milk is often skimmed by the dealer, and the cream being the lighter portion, the specific gravity of the balance is increased. He then adds water enough to bring it to the proper standard, and though the lactometer will not detect the cheat, the purchaser gets an article which was *originally* deficient in butter as compared with some of the other elements, and is *now* thoroughly impoverished.

10. That milk will absorb gasses and odors to such an extent as to be rendered thereby unwholesome, is, I believe, beyond dispute; and

11. It is believed by many to be an excellent nucleus for the development of numerous morbific germs.

I have pointed out these evils with no desire to create a prejudice against cows' milk, either as an article of general diet, or as a substitute for human milk in infancy; but, that when we use it we may be aware of all the dangers—and it will be readily seen that nearly all of them are preventable and avoidable. It will often happen in the future as in the past, that no better substitute can be procured for the child deprived of its mother's breast, and if the facts here collated shall in one such case lead to a more intelligent use of this delicate article, I shall not have written in vain. I have also had it in mind to prove, even by this cursory view of the subject, that we ought not to be content until we have discovered a substitute for human milk which is less liable to objection than is the milk of any of the inferior animals.

It is true that many efforts have been made to supply this great need. It is *not* true that because most of these efforts have been abortive, there is no hope of better success in the future. The excess of casein in cow's milk causes so firm a coagulum in the stomach, that this seems to be one of the most serious obstacles to digestion.

The condensed milk which has been evaporated at a high temperature, of which Borden's is a good example, has deposited some of its casein, and is improved thereby. In town, at least, I prefer condensed to ordinary milk. I have had most

experience with the fresh condensed, but some of my medical friends say the *canned* is equally good, if not better. It will all constipate, and this is one of the greatest evils with which we have to contend. The addition of limewater, in the proportion of one-sixth to one-quarter of the quantity of milk diluted and ready for use, will prevent the formation of so firm a coagulum as would otherwise be formed by the action of the gastric juice. The experiments of Dr. Chapman (SANITARIAN, Vol. III, 391), designed to show that limewater has a therapeutic value independent of and not explained by its alkalinity, are very interesting and instructive, and no doubt true in this indication; but that limewater and milk—good as I concede them to be, for I have used them in conjunction for twenty-eight years—can be *uniformly relied upon* as a diet for infants, or that they will generally restore marasmic children to health, I do not believe. Glycerine is said to have been used with advantage instead of sugar. I have had no experience with it. In the obstinate constipation of children fed on cows' milk, I have directed West India molasses to be used instead of sugar whenever necessary, and have found it useful.

[To be continued.]

ARSENICAL PAPER HANGINGS.—This forms the subject of a paper read before the Medical Observation Society of Boston, by Dr. Brown, Surgeon to the Children's Hospital. The History is given of a number of cases of disease evidently caused by arsenical poisoning through occupying rooms hung with paper containing arsenical pigments. He mentions also the case of two canaries dying in a room so papered, and without any other known cause; they "shewed signs of poison." And he speaks of a paper-hanger who had remarked that his mouth was always sore when he put on green paper, and his men often complained of their eyes becoming inflamed, and their hands ulcerating at such times. He urges the necessity of laws, such as they have in some countries, to protect people from such dangers.

DR. RICHARDSON, of London, cites the high death-rate of innkeepers, publicans, and the like, as evidence of the fatal effects of intoxicating drink. In London the mortality of all males is 2.012 per cent. annually; that of publicans, 3.466 per cent. In England, exclusive of London, the mortality of all males is 1.182 per cent. annually; of publicans 3.163 per cent. It is a striking fact that the death-rate in this class is higher than in any other class of male occupations named in the census, save one—the hackney-coachman.—*Pop. Sci. Mon.*

GRAPES.—Scarcely any plant surpasses the vine as regards the beauty of its leaves and fruit. As a covering for bare walls and for affording shelter and shade, it is a climber of the first rank. To sit under one's own vine has in all ages been considered the acme of rural happiness—an emblem of peace, a symbol of plenty, and a picture of contentment. That pleasure, though perhaps not in all its fullness, may become the heritage of thousands throughout the United States.

Our climate—variable as it is for a large portion of the Union—is eminently suited to the culture of the vine; and in some of the States the fruit attains a degree of perfection, for both eating and wine making, scarcely surpassed in the Old World. As food, ripe grapes are universally esteemed—no one ever tires of them, and people can live and work on grapes and bread quite as well as they can on *meat* and bread. Indeed, the wholesomeness of this kind of diet is beyond question. In parts of France, Spain and Italy the peasantry for a season, annually, almost wholly subsist on grapes and bread, and those who so live are noted for their freedom from consumption and scrofula—to such a degree as to have given rise to the "grape cures."

And there is scarcely a plant so easy of cultivation, or more ornamental as an arbor for the back yard of the city lot, or for cooling the gable of the country cottage. In this the vine has its healthful value for those who do not like grapes, if, indeed, there are any such persons. And for those who decline to eat grapes, or can thus cultivate more than they want for home consumption, there is always a ready market in town, to realize on space scarcely available for other purposes—good for rent.—*Sanitarian, N. Y.*

EXERCISE AND LABOUR.—Exercise, both physical and mental, is necessary to health; excess in either is productive of disease. Dr. Playfair has estimated the average work of a man at 105,604 metre-kilograms, which is nearly equivalent to the labour expended in lifting 106 metric tons, one metre high. Such a full day's work is equivalent to a daily walk of twenty miles. The soldier, in war, carrying 60lb. 14 miles a day, does nearly the same amount of work. The London policeman walks 16 to 20 miles in 8½ hours. Twenty miles a a day, with rest on Sundays, is a full day's work for a postman; with more he breaks down. Many men over-work themselves; women, too, are overworked in pregnancy and under-fed; and even children are over-worked, with the very worst of effects on their future life. In judging of the amount of work of which a man is capable, its kind, its continuance,

and its intermittences, have all to be taken into account. Thus Rankine reckons that a man can do three times as much work by pulling horizontally as he can by hammering; and Haughton, measuring by area, found that high mental and mechanical work demands a better quality of food than routine labour.—*Public Health, Lond.*

CLOTHING THE YOUNG.—"Hygiene of Dress" is the subject of a series of articles in the *Sanitary Record*. The author's remarks concerning the proper clothing of infants and children are judicious. "Warmth," he says, "is the first requisite for infants, who are very susceptible to cold. The clothing of the infant should be both light and warm. Its purpose is to protect the infant from chills, or rather to prevent too great a loss of heat. It should be ample enough to prevent any pressure on the blood-vessels, which would impede the circulation and hinder the free development of the members. It should be especially easy over the chest, in order to insure the free play of the lungs and heart, and should be equally ample around the stomach and the intestines, in order not to interfere with digestion. The sleeves should be wide, in order that the garment may be easily put on, and to favor the circulation of the blood in the arteries and veins of the arms and legs. The robe should be long enough to preserve the infant from cold, but not so long as to be a burden. The head should not be covered. A cap often tends to favor congestions; sometimes, too, it compresses the head, and certain cerebral affections have been, apparently with good reason, referred to this cause alone.—*Popular Science Monthly.*

A CRUCIAL experiment was recently made at Sunderland, England, on a fire-proof house. One of the rooms was filled with tar-barrels, wood, and other combustible material, and, when the door was shut, the mass was set on fire. It simply burnt itself out, without apparently affecting the condition of the adjoining rooms or the stability of the house itself. The building material was a concrete of cement and fibre bound together by strings of iron and wire. This becomes a sort of stone-cloth, available for floors and doors, as well as walls and ceilings, so that no wood whatever need be used.—*Ibid.*

AN Englishman who insualted his bedstead by placing underneath each post a broken-off bottom of a glass bottle, says that he had not been free from rheumatic gout for fifteen years, and that he began to improve immediately after the application of the insulators. A local paper quoting this item wisely adds: "There's many a fellow who could cure his gout, if he would break off the bottoms of his glass bottles in time."—*Exchange.*

To the Editor of the Toronto Sanitary Journal

Sir,—A leading writer in your Journal for March has fallen into serious errors on the subject of Dry Earth Closets, which I trust you will allow us to correct. We think he greatly underrates the inventive power of the Yankee Nation.

Your contributor admits that under certain limitations or exigencies the Earth Closet may be useful in private families, but for public institutions on a large scale in cities, it is unsuited and will not answer at all. This might be fully answered by reference to the cases of Wimbleton Camp, the Island of Mauritius and many other places in England and India, where the earth system has proved successful in spite of very imperfect appliances and other drawbacks. Whoever will take the pains to read Dr. Corfeild's book on sewage and disinfectants, and also that of George Warrings, will be prepared to understand the scope of this reform.

We will not go into argument to show the causes of failure more or less complete by every other earth closet, or attempt to explain the mechanism of our own, but rest our case by quoting below some very fresh, notable, and conclusive testimony *to the very point called in question by your contributor.* The first is from a leading architect in N. Y., Supt. of Parks, the second from the largest and best of the Centennial Hotels.

New York, May 25th, 1876.

To the Wakefield Earth Closet Co., 34, Dey Street, N.Y.

Gentlemen,—One hundred of your Wakefield Closets have been in use four years in Central Park. They have given *entire satisfaction.* We have ceased using the Water Closets which were *contaminating the water* of our Lakes.

Respectfully,

Julius Munckwitz, Dept. Pub. Parks.

Grand Exposition Hotel, *Philadelphia,* May 18, 1876.

Gentlemen,—The fifty Cabinet Closets that you sent us give general satisfaction to our guests. We will send you an order shortly for as many more, R. Riley, Manager.

We have it is true a commercial interest in this sanitary reform, but we presume that does not impeach the high character of the above and hundreds of other testimonials in our possession. *Trusting that the cause we represent may at* no distant day meet with the recognition it deserves,

We remain, very respectfully,

The Wakefield Earth Closet Company.

New York, May 30th, 1876.

THE SANITARY JOURNAL.

Communications solicited from Medical Men and others on all subjects pertaining to Public Health.

VOL. II. TORONTO, JUNE 1ST, 1876. No. 6.

PREVENTION AND CURE.

One of the foremost medical men in Canada, one of very high standing, and of great experience, Dr. Wm. Marsden of Quebec, concluded an article in the May number of this JOURNAL by drawing attention to the "truth in the trite old saying, that there is more virtue in an ounce of prevention, than in a pound of cure." We have long felt the force and truth of this, and while endeavoring to put it into practice, have striven to awaken medical men to what seems to be an undeniable fact, that prevention rather than cure should be the *first* duty of the physician of the present day. We have no desire to depreciate in the least degree the value of curative medicine, but on the contrary place upon it the highest value, but as in that department of medicine "Nature" so maintains her supremacy, and her powers to cure are so vastly superior to man's, that though he can do much, very much, to alleviate suffering and promote restoration to health—as in the use of surgical and other instruments, in supplying essential elements to the body, the want of which often constitutes the disease, yet he can do *comparatively* but little—little more than watch and aid the benign influences of the great Master, we therefore maintain there is greater scope for the exercise of the talents and skill of the physician—greater reward awaiting him, in the department of prevention.

Sir Wm. Jenner said, that to prevent disease is the first and most important aim of the science and art of medicine. When the mass of the profession recognises this and *acts upon it*, when there shall be a complete change in the relation between the public and the profession, then we believe will our profession rank first and highest, as it should, and

not be regarded as it now is, as second to those of Theology and Law.

We need not here say anything about the value and success of preventive measures. Probably all medical men will admit that one-half of all the cases of disease, which afflict the human family may be prevented and the death-rate reduced to one half, by the combined, judicious action of the general public and medical men, the former guided and assisted by the latter. To thus assist in lessening the amount of disease by one-half would be an easier task for physicians than to attend to that half during the period of disease, while the public could well afford to pay better for that kind of service. It may possibly be said that the public could not be brought to pay for that sort of service. Well, whether they could or not, our duty as medical men is plain. And, moreover, when we do our duty and serve the public in this way, we have a right to demand fair remuneration for the service; and we should no doubt receive it. The power of the medical profession must not be underrated. United, it is capable of exerting upon the public a force and influence that could not be brought to bear by any other class. The Medical man, says Dr. Lyon Playfair, "is gradually becoming more the confidant of the inner circles, than even the priest," and his influence is therefore great. What would be the effect in Toronto, on the minds of the inhabitants, if for a period of forty-eight or even twenty-four hours not one medical man could be found to attend on the sick?

Besides the work of Public Health proper, as usually understood, there is a wide scope for the physician in the way of personal or private hygiene, as affecting single individuals. We may ask, in the words of Dr. Holly, in a very interesting paper read before a Union Medical Society of Michigan, and published in the May number of the *Detroit Review of Medicine*, "have we not all often wished in our inmost heart that a more general knowledge of some of the simple laws of hygiene could by some means or other be so diffused through communities as to bring forth beneficial practical results." "It is through our noble profession alone that the masses must be

educated to a certain knowledge of the laws that govern life and death," and health. It is in this department of the medical profession that private practitioners are most directly and intimately concerned, and it is more especially here that some change is required in the relation between them and their patients. This is very plainly and squarely put by Dr. Farr, in his admirable and highly interesting supplement to the Registrar General's (Great Britain) Annual Report, noticed on another page. He urges that private hygiene must be placed on a better basis of recognition by the substitution of some more equitable relation between the afflicted and their physician; and that the public would derive more benefit from a medical man specially engaged as family advisor, at an annual stipend, than from attendance merely resorted to in illness. Service, he says, "would be greater and easier and pay higher;" while consulting practice would remain as at present. We should be glad to see the profession taking this matter into more serious consideration. To bring about a change in the relations mentioned, must take time. Such a change would do more to extinguish quackery, too, than all the laws that can be enacted, and the fines that can be imposed.

Annotations.

A DECENNIAL MORTALITY AND THE CONDITION OF LIFE.

A supplement to the British Registrar-General's Annual Report, compiled by Dr. Farr, deals with the lives and deaths of the English people during the two years, 1861-70, and is deeply interesting to all who are concerned in the subject of health, and the causes of disease. We extract the following comments thereon chiefly from *Public Health*, London, Eng.

The vital units dealt with in Dr. Farr's summary are the persons living and dying in the ten years ending with 1870 in about 627 districts. The primary object is to determine what the death-toll is at the several ages, and what the causes of the loss of life are under different circumstances. The desire for long-life is as old as the belief in its possibility. The dreams of the Alchemists were but efforts to realise on earth the immortality man had been promised by his oldest legends; and their influence is visible even upon Roger Bacon, Descartes, Franklin, and Condorcet, who all intimate that human life

may be prolonged indefinitely. The forces as well as the constituents, of the body are, indeed, humanly speaking, indestructible; but they are also fugitive, and are perpetually passing out of the men of existing generations into other forms.

There are fifty-four favored districts in England and Wales, including the London district of Hampstead, which actually experience a mortality at the rate of only 17 per 1,000—less by five than the average mortality per 1,000 of the whole country; less by ten than in nine districts, and less by twenty-two than the mortality reigning for ten years in Liverpool. The inhabitants of the fifty-four districts are by no means wealthy or educated people; on the contrary, the great mass of them are laborers and workpeople living on low wages; they get few luxuries, and rarely taste animal food, but *they dwell on salubrious soil, and are generally supplied with pure water.* Their sanitary condition is, however, by no means perfect, their habitations are crowded, and impurities abound; so that we are not pitching the standard of health too high when we assert that *any excess of mortality in English districts over 17 annual deaths to every 1,000 persons is due not to the mortality incident to human nature, but to other causes which may be avoided and overcome.*

The most interesting chapter in the whole Report is that entitled "The March of an English Generation through Life." Dr. Farr takes a million children, and follows their lives from the beginning to the end. During the first five years the deaths from all causes are 263.182. At birth the million children were unequally divided as regards sex, 511,745 of them being boys and 488,255 girls. The mortality of the first five years goes very far to reduce this disparity, and by the end of that period the boys only slightly exceed the girls in number. Nearly every one of the 736,818 survivors who enter on their sixth year of life have been attacked by one infantile disease or another—some by several diseases in succession. There is now however, one fact in their favour—the rare recurrence of the majority of the zymotic diseases. The total mortality in the next five years is, therefore, only 34,309, more than half of which is due to miasmatic causes. Still fewer are the deaths during the next five years; of the 702,509 survivors at the age of ten, only 17,946 fail to reach the period of purberty, or fifteen years; but during the next age of from fifteen to twenty the mortality increases, especially among women. From twenty to twenty-five large numbers marry; the deaths are 28,705, of which nearly half, or no less than 13,785, are from phthisis. This period is the age of love, of war, of dangerous work, and of crime. Of the million, 635,045 attain the

age of twenty-five, and 571,993 live to the age of thirty-five. This decade is the athletic and poetic age, and the prime of life. Consumption is the most fatal disease, women suffering more than men; the local diseases of lungs, heart, and brain also grow intenser in this period. From thirty-five to forty-five the losses are 69,078 lives. The combined faculties of muscular and nervous energy are now at their height; women have borne half their children, now they bear the rest. It is the age of fathers and mothers, and criminality declines. Phthisis and fever still predominate, and the brain, heart, lungs, and bowels become more and more the seats of destructive diseases. From forty five to fifty-five is the "middle arch of life," for the million are reduced to half a million lives a few months after the age of 45. The deaths from all causes are 81,800. Suicides and other violent deaths increase, and cancer, a formidable disease that began to be fatal before, now reaches alarming proportions. The number of men and women surviving becomes equal at the age of 53, but at and after 55 the women exceed the men in number, as their mortality rate is lower even after the age of 39. While 421,115 of both sexes enter this stage of life, 112,086 die, leaving 309,029 survivors at 65, 161,124 reach 75. The age of 72 is that at which most men die, and this fact may have lead the Psalmist to make his well-remembered assertion. Threescore and ten is not, however, necessarily the limit of existence where the laws of health are observed. The numbers that enter the decennial between 75 and 85 are 161,124 of which only 38,565 leave it alive. Cold is now the great foe, but many die of atrophy, debility and old age. The 38,565 aged pilgrims now rapidly disappear; only 2,153 live to be 95, 223, to be 100, and finally at the age of 108, the last survivor of the million dies.

An interesting question, answered by one series of tables in the Report is—What are the relative chances of death at different stages of life? We ask, for instance, Of what disease is a child just born most likely to die? Dr. Farr replies, Of some local disease, in the present state of England; for of 1,000,000 born, 424,480 will die of specific diseases, the breath-organs standing first in the list of fatality. Similar calculations as to mortality at all ages, and from all causes, can be easily made by the help of these tables. Another point of interest to the political economist as well as the sanitarian, is the economic effect of deaths by different diseases. Life has a distinct pecuniary value, far different, indeed, remarks Dr. Farr, from that attached by the mother to helpless child, or from that which the son, with filial piety, is ready to sacrifice

for his father, but agreeing, on the whole, with the popular appreciation of value expressed by national grief at the death of conspicuous characters, which is always greatest when death occurs at the ages when life is most precious. The worth of any life is determined by valuing, first at birth, or at any age, the cost of future maintenance, and then the value of the future earnings. Proceeding thus, Dr. Farr found the value of a Norfolk agricultural laborer to be £246 at the age of 25. By this standard, the value of the child at birth is £5; at the age of 5, £56; £117 at the age of 10; £192 at the age of 15; £234 at the age of 20; and reaches its maximum of £246, as before stated, at the age of 25. The value then declines from £241 at the age of 30, to £138 at the age of 55, and becomes only £1 at the age of 70. After that age the cost of maintenance exceeding the value of earnings, the value becomes negative. In the education of professional men more capital is sunk, and generally speaking, at greater risk: and it has to remain longer under investment before it is returned. The maximum value of such a man is not attained till later in life—probably not till 40, and in the higher grades of the Church, Law, and Politics, the life still increases in value at higher ages.

Dr. Farr remarks that much of the avoidable misery of mankind is due to untimely death and disordered vitality. Though by the laws of life no man can be certain that he will continue in existence another year, he may, if blest with an average constitution, justly expect "his days to be long in the land" if he keep the Divine Commandments proclaimed by Science. Death is simply the natural sequence of certain causes. Loss of blood, asphyxia, starvation, lightning, fire and frost, and other agencies kill men instantly or slowly; but the danger from all these can be obviated to a large extent by precautions, sometimes simple, sometimes elaborate, on the part of individuals and communities. Air is well called vital, but when charged with either organic or inorganic particles it becomes a medium of contagion. Water is the first necessary of life, and the want of it in a pure state, owing to the waste due to lack of storage and the pollution caused by sewage, is a matter of national concern, to which private interests should present no obstacle. To the want of pure water is due in no small degree the immoderate indulgence in fermented liquors, which is so deleterious to health. Intoxication, formerly the vice of the rich, is now chiefly the habit of the lower classes, and has of late years attracted the attention of a zealous school of social reformers, who, for the protection of drunkards, propose to suppress public-houses and

beer-shops altogether. This, Dr. Farr believes, is neither possible nor desirable. Alcoholic liquors enter the blood readily, and with other food are a part of diet; their use as beverages must be regulated by climate, weather, and temperament. The pending experiment of total abstinence by thousands of all classes seems to show that men can live in health without alcoholic drinks; but whether their lives are better or worse, or will become better or worse as age creeps on, than the lives of their fellow-mortals, the insurance offices will find out; anyhow, abstainers deserve the watchful attention of the physiological student. No deaths are ascribed in the registers to non-alcoholic drinks. Tea, coffee, and cocoa *afford salutary subsidiary diets; but in excess tea shakes and* saps the nervous system, especially when drunk largely by women, without food. Opium, taken habitually, is in the end fatal. We will continue the notice of this in our next.

HEALTH OF INDIA—Captain Douglas Galton, C.B., D.C.L., last week (*Med. Times and Gazette*, April 29th,) read a paper before the Society of Arts, on the Sanitary progress of India He maintained that there was no subject of greater import ance to the vast population of that empire, but to apply our hygienic knowledge to benefit them would be an Herculean task. Precautions against disease were tenfold more necessary there than in this country. The basin of the Indus contained districts where the average rainfall was as low as six inches in the year, while the Ganges rose as high as 370 inches; this showed the varying climate of the country. Down to 1862 the neglect of sanitary administration in India had been most grievous, and the result was that from the time of the establishment of our Empire there the death-rate of the British army had been enormous. It was shown from the Report of the Royal Commission of 1862, that from 1830 to 1845 the deaths of the European army in Bengal averaged 67 per 1000, of which number 58 per 1,000 were from zymotic or preventable diseases. The European army in India now amounted to about 60,000 men, and had the death-rate of former times continued, the population of Great Britain could scarcely have stood the drain upon it for recruits. But the death-rate in 1874 was only 13·58 per 1,000; yet the mortality from preventable causes was still too great, for in years of cholera epidemic it would be largely increased. We had now provided the soldier with barracks of unsurpassed accommodation, good food, and agreeable occupation; but outside the.

barracks the insanitary agents had a depressing effect on him A sad account was given of the filth and disease in that country. In 1874, fever added 1,644,342 to the number of deaths. In one district, in 1872, almost every human being was suffering from fever; and afterwards it was stated that the population had decreased from 46,121 to 32,687 inhabitants. Cholera was also most deadly; there was no country where it was more sudden in its appearance, or more rapidly fatal. There also appeared to be a district where cholera was endrmic. At the root of the whole question of sanitary improvement of India lay the question of an accurate registration of births and deaths of the population. But a census was fraught with great difficulty, from the superstitious ignorance of the people. The education of the people themselves in the appreciation of the real value of "sanitation" would alone solve the difficulty of the question. The Government of India had set itself a gigantic task; and though the progress of sanitary reform there had no parallel in the history of the world, each step forward had only shown how much had still to be done. To arrest the enormous waste of national health and wealth it was necessary to remeve the sources of contamination of the air and water.

DIETETIC VALUE OF WATER-CRESS.—The *Medical and Surgical Reporter* says: If Americans would eat more freely of soups and salads, and give pies and hot bread the go-by, dyspepsia would be less frequent. One of the best of the spring salads is water-cress. According to a recently published analysis by M. Chatin, Director of the School of Pharmacy of Paris, and present President of the Academy of Medicine, water-cress contains:—a sulpho-nitrogenous essential oil; a bitter extract; iodine; iron; phosphates, water, and some other salts. Water-cress has been vaunted for its efficacy in all cases in which the digestive organs are weak, in cachexia, in scurvy, in scorfula and lymphatism; it has even been prescribed as a cure for phthisis. The medicinal principles which it contains are more or less abundant according to the culture or maturity of the plant. As food, water-cress ought to be used in its green or uncooked state, in the form of salad, or without seasoning.

A STATE BOARD of health and a National Health Bureau is urgently called for in some forcible articles in the New York *Medical Record*. Many States have now a State Board, and we trust New York State may be the next one to institute such an essential organization. There seems to be a very general desire for a National Central Health Bureau at Washington.

CHOLERA AND CLEANLINESS.—In a minute history of the spread of the epidemic cholera in 1847 through Asia and a part of Europe, the author, Dr, Verrollot, physician to the French Embassy, describes its general spread, and terrible ravages, from the shores of the Caspian sea up the river Volga, among the semi-civilized Musselmans, and still more filthy and degraded Russians, and mentions with great, but reasonable enthusiasm, one place as a remarkable exception. (Dr. Holly, in *Detroit Review of Med.*) There is a small Moravian colony called Sarepta, situated in the bend of the river in the midst of the Kalmuck hordes, eulogized by all travellers for its remarkable industry and minute cleanliness and for all other fortunate and laudable features of character. The cholera seemed to respect this sacred spot, passing by in 1830 and again in 1847 without inflicting on it the least evil. This fact, corroborated as it is by others of like character, speaks volumes on the subject of prevention, and leaves nothing further necessary to be said. Prof. Palmer sententiously remarks: "If the inhabited globe were a Sarepta, this terrible scourge would disappear from it forever.

PUT YOUR HOUSE IN ORDER.—Though highly important that cellars and back yards should at all times be kept free from all decomposing organic matter and dampness or standing water, it is particularly essential that such places should be looked closely after in this way during the coming warm season. Any earth which has been saturated with slops should be entirely removed, and if necessary, fresh dry earth substituted, and any parts emitting the slightest odor should be disinfected. A quantity of dry earth, coal ashes, or some finely powdered ferri sulphate (copperas) should be repeatedly thrown into all privy vaults, and about stables. By a little timely attention to such matters much suffering may be prevented as well as money saved.

MR. SIMON'S RESIGNATION.—It is rumoured that Mr. Simon whose health reports are so highly valued in Great Britain and elsewhere, contemplates resigning his official post. Anything more disastrous to practical and scientific hygiene at the present moment in this country we cannot well conceive, says the *Lancet*. Dr. Parkes's loss to the public by death was an irreparable but uncontrollable misfortune; Mr. Simon's resignation while in the fullest vigor of his unrivalled powers would be a loss to the public involving the gravest responsibility, and which can hardly go unquestioned.

How Typhoid Fever is Spread.—Dr. Frankland, *(Lancet*, April 15th), in a recent address to the Fellows of the Chemical Society on the Organic Impurities of Drinking-water, adduced, as a striking instance of the persistency of the typhoid poison when diffused in water, the outbreak of a violent epidemic of typhoid fever in a Swiss village through the use of spring water which, after contamination with the poison, had filtered through nearly a mile of porous earth, but had nevertheless lost none of its virulent properties. The occurrence is one of the most remarkable on record, and the circumstances have been exhaustively investigated, by Dr. Hagler. In the Furler Valley, at a farm-house, in June and July, two cases of typhoid fever occurred. Nearly a mile away, in the village of Lausen, on "ground consisting of marl and lime, tolerably water holding," on August 7th, ten persons were attached, and in nine days 57 more, with typhoid fever; while before the end of October, 130 persons had suffered from the disease, "besides several children;" all of whom used water from a certain public spring. Epidemic fever had never occurred here in the memory of man. It was well-known to the inhabitants of Lausen that when the meadows in the Furler valley were watered, this spring increased in amount. The passage of water from the valley to the spring was proved by dissolving in it at the meadows, eighteen hundred-weight of common salt, and then observing the rapid increase of chlorine in the spring water; but the most important and interesting experiment consisted in mixing uniformly with the water fifty hundred-weight of flour, not a trace of which made its way to the spring; showing that the water was *filtered through the intervening earth*, and did not pass by *underground channel*. But the filterng did not remove the typhoid poison.

Public Health and the Royal Title.—The London *Lancet*, profoundly regrets that no real progress in sanitary legislation is likely to be effected this session in Great Britain. "The air we breathe and the water we drink are both to remain foul a little longer, and all we gain in exchange is a new title for our Queen, and that, too, a title which is desired by none and strongly disliked by very many."

Seats for Saleswomen.—A ladies' committee in Manchester has caused a circular to be forwarded to all local shopkeepers employing female assistants, urging upon them the propriety of providing seats for their saleswomen when not engaged in serving customers. The document has been approved of by many members of the medical profession.

NEW BUILDINGS A SOURCE OF DISEASE.—As the building season is fully established and many new buildings are being erected everywhere, a timely hint as to the danger of inhabiting them too soon may not be wholly lost. Lung and glandular affections, rheumatism, neuralgia, fever, &c., are very liable to affect those who dwell in quite new houses. A writer in the *English Mechanic* suggests the use of a dewpoint thermometer as a means of determining whether or not a house is sufficiently dry to live in. The Italians have a proverb which says:—"When you have built a new house, rent it to your enemy for the first year; to your friend for the second; then go into it yourself."

NOTES, QUERIES AND REPLIES.

BIOMETRY.—A large foot, high instep, and short fin[illegible] because webbed half way from the metacarpo-phalangeal articulation to the first phalangeal articulation, (from the first to the second joint,) especially this deep web, are said to be very decided signs of long life.

THE ARABIAN PHYSICIANS say: "Eating for living and praise (of God): You think that living is for eating." We have a like wise saying: "We should eat to live, not live to eat."

LICENCE.—The first Statute on record imposing restrictions on *ale-houses* was 5th and 6th Edward VI., chap. 25. It provides that none should keep an ale-house without a licence by two justices of the peace.

TOLEDO, OHIO, thirty years ago, was regarded as one of the most unhealthy places in the United States. Now, with 50,000 inhabitants, as the result of efficient sanitary labor, the annual death-rate is about 14 per 1,000, the lowest of any city in the Union. They have a tax of 1 mill. per dollar for sanitary purposes.

IN RE-PAPERING the walls of rooms it is of the highest importance to have the walls first well *scraped* and *washed* in order to remove every trace of the old paper. Paper-hangers must be looked after closely while at such work, or it will rarely be safely done.

BARLEY WATER.—Boil two tablespoonfuls of best pearl barly in a quart of water until it is "smooth;" then strain it through muslin and it is ready for use.

MILTUM IN PRAVO.—The New York *Herald* recently contained the following advertisement:—"Wanted—a few young men lately landed, to work in a distillery store; *those who smoke, chew or drink, need not apply.*

THE QUEEN has conferred the honor of the Companionship of the Civil Division of the Order of the Bath on Mr. John Simon, F.R.S., medical officer of the Privy Council, Great Britain.

BOOK NOTICES.

SOME PRACTICAL POINTS IN THE TREATMENT of those forms of eye disease of most frequent occurrence in general practice, by A. M. Rosebrugh, M.D. A pamphlet of much practical value; Toronto: Dudley & Burns.

The *Canadian Monthly* and *National Review*. Toronto: Adam, Stevenson & Company.

Canadians have reason to be proud of this publication, now only in its fourth year. The literature, upon the whole, is of a very high order. Its "Current Events" are worth almost the price of the magazine, for present information and as an historical record, while its "Reviews," "Current Literature," and "Music and the Drama," are highly instructive and interesting. The May number is certainly not behind its predecessors. Many in these times of "doubt" might be benefitted by reading the article on the "Immortality of the Soul," by Prof. Goldwin Smith. Though open to criticism, especially in his remarks on Necessarianism, though possibly he has not made himself quite plain to our understanding (if he means that man is not much more largely influenced by external or antecedent circumstances than by the will, we do not agree with him) he puts it strongly against the absolute "Scientists" when he says:

"To refer absolutely to the authority of the senses, and reject as necessarily baseless anything which they do not confirm, has become more unreasonable than ever since science herself has proved that the nervous organizations on which the senses depend are, like everything else, in a state of flux and development. If they are in a state of flux and development, how can their present decisions be final."

The lighter literature of the *Monthly* has become somewhat suddenly elevated by the publication of "As Long as She Lived," by F.W. Robinson. The poetry, though not always by any means equal in "standing" to the other departments, is often very pretty and frequently good, and serves as spice for the more solid food.

THE *Aldine*, the Art Journal of America, Toronto: Geo. Virtue, Adelaide Street, East.

This popular work continues to increase in beauty. Commencing in 1868 as a sheet to illustrate the quality of printing, it has worked up to a standard of elegance surpassed by few. It is not an ideal publication; and its pictures are less costly than those of L'Art, while its subscription price is lower. But as a repository of cuts, many of them admirable, most good, it is certainly a success. Among its contributors are American artists of high standing; while English, Italian, and even Canadian art has been allotted space in it. As a collection, too, of sketches, poems and short stories, it holds a very respectable place.

COMMENDATORY LETTERS TO THE EDITOR.

The following are copies of, and extracts from, a few of the many letters to the Editor, received from time to time, from medical men and others, regarding the SANITARY JOURNAL, unsolicited, of course, and, with two or three exceptions, the writers being personally quite unknown to the Editor :

TORONTO, December 7th, 1875.

DEAR DR. PLAYTER :— . . Please send me your receipt for the enclosed two dollars, for your valuable Journal. I wish all in the profession valued it as I do. . . .

Very truly, JOSEPH WORKMAN, M.D.
(Late Supt. Toronto Lunatic Asylum.)

BOWMANVILLE, June, 1875.

DEAR SIR :—I am much pleased with your Journal . . . I look upon it as one of the most useful periodicals with which I am acquainted, and especially to the medical practitioner, who wishes to keep pace with the advancements of science. Yours truly, W. ALLISON, M.D.
(Member Medical Council, Ont.)

GLANFORD, ONT., November 22nd, 1875.

DEAR SIR :—Enclosed you will find $2, to be applied to SANITARY JOURNAL. . . . . I think your journal is doing a good work, and that such a magazine was much needed in Ontario. Wishing it every success,

I remain, yours truly, ALEX. BETHUNE, M.D.
(Member Medical Council, Ontario.)

OAKVILLE, March 18th, 1875.

MY DEAR DOCTOR :—Enclosed please find one dollar for your really valuable Journal. . . . . Accept my best wishes for the success of your new enterprise. Yours faithfully, D. D. WRIGHT, M.D

DUNDAS, September 10th, 1875.

MY DEAR SIR :—Please receive the enclosed $2 for the SANITARY JOURNAL. Your moderately-priced monthly contains much that is of interest to the reading public of all classes. . . . Much valuable information as well fitted for the general reader as for the professional student. It ought to receive a large measure of support, and I heartily wish it every success.

I am, my dear sir, yours truly, JAMES HAMILTON, M.D.,
(Late Member Medical Council, Ont.)

LANSING, MICH., August, 12th, 1875.

DEAR DOCTOR :—I am much pleased with your Journal. . . . . I read it with interest, and satisfaction, and sincerely hope its circulation may be increased, believing, as I do, that the interests of public health will be advanced thereby.

Very respectfully, H. B. BAKER, M.D.
(Sec'y Michigan State Board of Health.)

TORONTO, December 13th, 1875.

Dr. PLAYTER,—*Dear Sir* :—Enclosed find amount of subscription to the SANITARY JOURNAL. I am much pleased with it, and feel that I cannot say too much in its behalf. . . . I hope the publication will receive the support its merits deserve ; it should be carefully studied by every man, woman and child.

Yours very truly, DONALD MCDONALD.
(Senator Dom. Can.)

WARKWORTH, November 17th, 1875.

DEAR SIR :—I appreciate your Journal very much. It contains information but little understood by the mass of the profession. I give you my best wishes.

Yours truly, P. D. GOLDSMITH, M.D.

HEALTH DEPARTMENT,

MONTREAL, November 26th, 1875.

DEAR SIR : Enclosed, with the amount of one year's subscription, you will find a list of prominent citizens who will willingly, I think, subscribe for your valuable Journal. Yours truly JAS. I. FLYNN.

The following are Notices of the Sanitary Journal by the Press.

THE CANADA LANCET says :—"The SANITARY JOURNAL is very well got up and contains good articles on Public Health. We wish our contemporary every success."

PENINSULAR JOURNAL OF MEDICINE.—"We welcome to our list of exchanges the SANITARY JOURNAL. It presents a very neat appearance, its selections are well made, and its editorials exhibit an ability competent to the consideration of this important branch of science. We wish the new comer a long and vigorous life."

POPULAR SCIENCE MONTHLY, New York, "THE SANITARY JOURNAL, edited by Edward Playter, M.D., Toronto, both in its editorial and its selected matter, gives evidence of being conducted with ability. It is to be hoped that the enterprise will be sustained by the Canadian public."

NEWMARKET, January 5th, 1875.

DEAR SIR :—I have received, with much pleasure, two numbers of the SANITARY JOURNAL. I congratulate you on the start, and wish you every success in the progress of this important branch of medicine. Will do all I can to forward its interest. Yours respectfully,

J. GRANVILLE HOCKRIDGE, M.D,

CANADA MEDICAL RECORD, MONTREAL.—"This is the only Sanitary Journal published in Canada * * * we wish it every success, and trust it will be the means of doing much good."

MEDICAL TIMES AND GAZETTE, LONDON.—"The Sanitary Journal, edited by Edward Playter, M.D., Toronto. The July number of this publication . . . contains some original communications on lead-poisoning, vaccination, sanitary legislation, water supply, etc. . . . The matter is well written."

NEW YORK SANITARIAN.—"We welcome the first number of this effort to popularize Sanitary Science. Sanitary Science; Means which shorten life; Effects of Tobacco; Rules for preventing the spread of Contagion, with twice as many equally suggestive editorial headings, indicate a manly grasp of the enemies of human health, and we hope for it a long life and a vigorous contest."

KINGSTON BRITISH WHIG, "The SANITARY JOURNAL, edited by Dr. Playter, is performing a very useful mission, in instructing the public mind on some of the questions which vitally affect the public health. The papers are written very ably, and interest one while they convey a large amount of information. The publication should have a wide circulation."

TORONTO GLOBE.—"This is a series of admirable papers on Health. We commend it to all who are wise enough to believe their own organization of as much importance as any other study."

LEADER, Aug. 9, '75.—"The SANITARY JOURNAL, edited by E. Playter, M.D:—This valuable journal, since its new form of issue, seems to increase in excellency. The papers are written on all important subjects connected with public health. The selections are made with special reference to every day matters of household hygiene. The number contains some valuable editorials. We can only say, as we have said before, that for this alone the serial should be in every household."

HEALTH REFORMER.—It takes the right positions on the temperance and tobacco questions, as well as general reform. We trust that the people of Canada are sufficiently awake to their interests to give it the support which it well deserves.

LONDON FREE PRESS.—The contents are valuable, conveying to the general reader in a pleasing style many things bearing upon health, with which all should be acquainted."

OTTAWA TIMES.—"A knowledge of Sanitary Science is no mere accomplishment; it is a positive necessity if there is to be a fair modicum of attention paid to the prevention of disease and the prolongation and enjoyment of life. * * The SANITARY JOURNAL is neatly got up in every respect. The selections are carefully made and from good authors. * * In the editorial department there is a very excellent article on Preventive Disease. "Defective Drainage" is also treated with considerable power. The magazine is altogether a creditable production, and ought to command a wide circulation.

KINGSTON DAILY NEWS.—"We have received the third number of this valuable magazine, the contents of which are of surpassing importance to every citizen. Ventilation, drainage, and cleanliness, commend themselves to every one desirous of enjoying good health or prolonging life, and these are fully treated of in the pages of the SANITARY JOURNAL. We hope it will be extensively patronized, not only by the medical profession, but by the people generally, in whose interest it is published."

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