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CANADA

HEALTH JOURNAL,

A MONTHLY MAGAZINE OF
PREVENTIVE MEDICINE

—EDITED BY—

EDWARD PLAYTER, M.D.

Public Health and National Strength and Wealth.

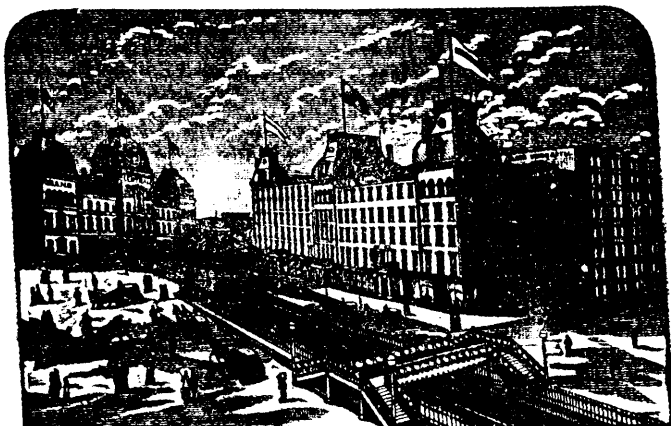
CONTENTS :

Prevailing Diseases and their Prevention—Consumption.....	41	Micro-organisms in Rooms—Remarkable Results of Research.....	63
Prevention of Puerperal (Childbed) Fever.....	44	Diseases of Domestic Animals—Their Relation to the Human Family and Hygiene.....	66
Sleeplessness—its Causes and Prevention.....	46	Dining.....	70
Wash Your Hands.....	48	How some of the Great Ones see us..	70
Putrefaction and Infectious Diseases	50	Never Conceal Plumbing.....	71
The Money Value of Health.....	54	True Jennerian Cow-pox.....	71
The Poison in Breathed Air—Recent Important Experiments.....	56	Editor's Special Corner—Self-control—House Cleaning—Infections of Disease in the Body.....	72-74
Pain and Relief—Disease and its Treatment.....	57	Observations and Annotations—Numerous Useful and Interesting Notes.....	74-79
International Sanitary Legislation and Quarantines.....	60	Notes on Current Literature.....	79-80
Important Points in Vaccination....	61		

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The Canada Health Journal

VOL. X.

FEBRUARY, 1888.

No. 2.

PREVAILING DISEASES AND THEIR PREVENTION.

I.—CONSUMPTION.

THERE is a great deal relating to the causes of tubercular consumption that, outside of the medical profession, is greatly misunderstood, and which if it were generally known many valuable lives, which are now sacrificed through this ignorance, might be preserved for many years. Men and women are daily falling victims to this disease, because they believed themselves doomed to it. Because a parent or a grandparent, an uncle or an aunt had died of the disease, "they are tabooed by society as fore-ordained victims," refused life insurance, and live an objectless, unhappy life; and chiefly because they know little or nothing of the causes of the disease, they do little or nothing to avoid the cause. Living as if doomed, they at most make only an effort to prolong their life a little or to make it as tolerable as they can. Very many others besides these, it is true, with no supposed hereditary taint, fall unconsciously into a condition in which they become easy victims to the disease.

Not less probably than 200,000 human lives are yearly destroyed on this Continent by this disease, and chiefly or largely by reason of public ignorance relating to its causes.

I have long contended that the disease is not strictly hereditary, or only in so far as configuration and structure of body may be hereditary. From statistics collected a few years ago by the Editor of this Magazine, and from observations in practice, I am convinced that the victims of this disease are almost invariably, if not quite so, limited in respiratory capacity—they have small lungs—these organs are the weak point in their bodily structure. This defect may be easily enough overcome in early

life, and is not difficult to remove during middle life. I believe it is plain that in this is about all there is in heredity or predisposition as regards consumption. I am quite in accord with the opinion of Dr. Flick, of Philadelphia, who recently in a paper at a meeting of the County Medical Society, said that heredity, *i. e.*, as now commonly understood, "Ought to be out of the question at the present day. It is an unscientific theory, and at variance with all modern knowledge about the etiology of disease. Its complete eradication from the public mind is one of the first steps necessary in a sanitary crusade against phthisis."

The causes of consumption may be well considered under two heads. Under one, come all those causes which produce in the body a receptivity to the other cause; this other cause, the exciting or immediate one, being as hardly disputed by any one at the present day, the bacillus tuberculosis of Kock.

Under the first head may be placed any and every cause which tends to lower the vitality of the body. It is only in an organism in which there is a diminished vitality that the bacillus can take root, develop and carry on the work of destruction. And it seems probable, on the theory of Dr. Carpenter, that the bacilli will not live and multiply in an organism except where there is in the fluids of the organism retained waste decomposing matter—matter which should, and in a vigorous, healthy condition would have been thrown off from the body by the excretory organs—skin, kidneys, etc.

Some very interesting investigations were made a year or so ago by Prof. Metschnikoff. It appears that he found, with the use of a powerful microscope, that in certain conditions of an animal, as a rabbit, certain little organism, such as corpuscles or cells in the blood and lymph of the animal, had the power of directly destroying, as it were devouring, certain bacilli, as those of anthrax, when these were placed along side the corpuscles; the bacilli entered the corpuscle, broke up and disappeared. In other conditions of the animal, it was found that the reverse of this took place, and the bacilli seemed to destroy the corpuscles. Now, what were the conditions of the animals in which these opposite effects took place? It is a fair inference that there was

a diminished vitality in the corpuscles which succumbed to the power of the bacilli. Either this, or the bacilli were in the one case more vigorous or virulent than in the other. It may be that in both these ways an explanation may be found.

In a communication to the British Medical Journal, a Mr. W. Dawson, writes: "It would appear that many individuals do not take scarlet fever, simply because their epithelium [the thin outer layer of cells, the cuticle, of the membrane lining the lungs and other internal parts] is able to resist the efforts of the organisms to establish themselves" This appears likely enough, and it may be in a similar way that those in good health resist the bacillus of tubercle.

Again, I cannot do better than quote here the words of the Editor of this Magazine, in the British Medical Journal of October 29th last, as follows: "The bacillus of tubercle is, it appears, an organism which develops slowly, requiring many days, when artificially cultivated, before it begins to grow. When a healthy individual inspires the 'brutes' they are driven out of the body by the vigorous action of the lungs, in expiration or expectoration, before they have had time to select a nesting place, even were a suitable spot to be found there for their development or growth and multiplication. But if a portion of a lung chance to be consolidated, or even partially so, as from catarrhal pneumonia, or possibly it may be only in a state of congestion, as from a 'cold,' with unsound epithelium and defective respiration, the parasitic organism has opportunity to establish itself. Such opportunity, too, possibly may be afforded in the apices of the lungs of persons, and there are many such, whose respiratory movements are very imperfect, and in whom the extreme upper portions of the lungs are hardly exercised at all. And this is a locality in which incipient tuberculous deposits in the lungs are oftenest found."

I must defer for another paper detailing and treating of the many causes which come under the first head, and which give rise to lowered vitality. The chief ones, it may be well to mention, are, besides a naturally small respiratory capacity, rebreathing breathed air, through confinement indoors, improper food, depressing discharges or habits, over work, dissipation and damp soil.

M. W.

PREVENTION OF PUERPERAL (CHILDBED) FEVER.

AT THE last meeting of the British Medical Association the time of the Section on Obstetric Medicine was largely occupied in discussing the causes and prevention of puerperal fever (Metria), and a number of very valuable papers were read on this subject. It is clear that by anti-septic practice in lying-in hospitals within the last decade there has been a vast saving of life, and of valuable adult life of mothers. Statistics show that since the free and judicious use of anti-septics the rate of mortality from puerperal fever has been greatly reduced. Dr. Byers, Physician for Diseases of Women at the Royal Hospital, Belfast, at the Association meeting, read a comprehensive paper on the prevention of this fever in private practice. He said :— “ It has been stated that one per cent. of all confinements end fatally as an immediate or remote result of the labor. We cannot hope to abolish all deaths from pregnancy and labor, but our great aim should be to prevent deaths from puerperal fever. In many lying-in hospitals this prevention has been practically accomplished ; but it is far otherwise in private practice, and it is in the hope of bringing before you measures by which this fell scourge, which costs the life of so many women, may be banished out of the list of diseases, that this paper is written.” In a private practice of over twenty years, the writer of this has known of many deaths from this cause, and not only in city practice, but in rural localities, deaths, which no doubt might have been prevented by the use of anti-septics ; a practice hardly known during the most of that period. At the Association meeting, too, Dr. W. S. Playfair, L.L.D., F.R.C.P., (Prof. Obst. Med., King’s Col., and Phys. King’s Col. Hospt.), said :—“ I am particularly anxious to-day to insist on the prevention of puerperal disease in private and domiciliary practice. In lying-in hospitals, since the great revolution produced by the general recognition of the importance of anti-sepsis, a marvellous change has been effected. From being hotbeds of death and disease . . . in the majority of well managed lying-in hospitals a woman is now actually as safe, if not safer, than if she were confined in a large and luxurious private house, with nurse, physician, and all that money could procure. This is no

exaggerated statement. The great lying-in institution of Dublin is a case to point. The statistics of similar institutions in London, Paris, St. Petersburg, and every large Continental city, corroborate it. There is nothing in the history of medicine more remarkable than the change which has come over the working of these public institutions. Although the principle is universally recognised, and I believe, everywhere practised in public institutions, I very much question if even yet antiseptic midwifery is at all in general use in private practice. Perhaps in the near future, when the younger members of the profession enter more largely into work, it will be different; but with the bulk now in practice no special care is taken. Yet, if the work of public charities in which lying-in women are congregated can be conducted with the brilliant results which recent statistics show, *a fortiori*, in civil practice similar care and precaution—a matter of no real difficulty to practise—should almost wipe this scourge out of existence.”

Dr. Playfair further said :—“ I honestly believe that many and many a case has originated in the nurse.” She is “ constantly handling ” septic parts for days in succession. Moreover, many of the “ older nurses persistently set themselves against antiseptic precautions as ‘ new fangled fads which they don’t hold with.’ ” If they are positively ordered to carry them out they may do so in a perfunctory way. The tips of the fingers are just dipped in the antiseptic solution; or a sponge is used and put away unwashed or imperfectly washed.” Dr. Byers, in his paper said :—“ A nurse who has an enthusiastic belief in strict antiseptic measures, is worth a dozen who simply carry out the precautions in a mechanical way.”

As to the causes of this fever, it is the universal medical opinion that while many cases arise from the infection conveyed by the medical attendant or mid-wife,—bacteria, schyzomycetes or other poison, from a case of scarlet fever or erysipelas or from a cadaver or septic wound—yet many, many cases are of a purely autogenetic or endoseptic character, *i. e.*, arising within the patient, from errors in diet, malarial conditions, chills, etc., which check the normal action of the excretory organs, and so give rise to a septic condition of the system, or from causes not strictly

within the body, as "foul stuff" on clothing, "clots," and the like. From such causes as these, and, as Dr. Barnes, Consulting Obstetric Physician, St. George's Hospital, in another lengthy paper at the same meeting, put it, from "emotions" and general "bad hygienic surroundings," "the fever may arise without the necessity of invoking any external poison" or infection.

More details as to the causes of the fever and their removal, with directions for nurses and others I must defer until next number. M. W.

"WASH YOUR HANDS"

MEDICAL Journals have recently discussed the importance, as a preventive of various forms of serious blood poisoning, of the most absolute cleanliness of the hands of surgeons, physicians and nurses. This subject extends in a measure to all who wait upon the sick, and especially upon the mother just after her confinement.

It has been long known that when an infinitesimal portion of decomposing animal matter gets in any way into the blood of another animal, it often produces serious, sometimes fatal disease. Physicians, especially after post mortems, and butchers are notably liable to such forms of blood poisoning, through slight wounds. It now seems clear that puerperal fever (that of lying-in women) is frequently caused in this way.

In the household all decaying animal substances, such as decomposing flesh, fish, eggs or even cheese, should always be safely and quickly disposed of by being buried or burned. Clothes worn by the sick, or especially by those having dischargingly wounds, should be frequently put for a short time in boiling water, and any useless clothes or rags burned. Nurses, or indeed any others handling any such things should thereafter be exceedingly particular about their hands, which should be at once well washed and disinfected. To some all this may seem to be needless trouble, but it is only by such scrupulous attention to minutiae that we can secure absolute safety.

A good article under the above head recently appeared in the Southern California Practitioner, from which the following is an

extract :—" In our search for germicides, some too often forget that antisepticism, like charity, begins at home. Are we sufficiently careful to clean our hands? No! We examine a series of cases in the office, a suppurating wound, a case of erysipelas, a uterine case having its origin perhaps in an old gonorrhœa, and then, after giving our hands a hasty dip in cold water and drying them on a dirty towel, draw on a pair of necessarily impure gloves, and rush off to a case of labor, perhaps dropping in on our way to pay a hasty call to some child suffering from scarlet fever or diphtheria. True, our puerperal cases often have fever, due *of course* to malaria, or to some defective water-closet plumbing, or a pelvic inflammation sets in, laying the foundation for much future gynecological work; or we have death from a mysterious disease called puerperal fever. Now, are these disasters due to poor nursing, to imprudence on the part of the patient, or are they visitations of Providence? Most of the troubles following child-birth originate from disease germs, or, if you like the word better, from *dirt*, introduced too often by the hands of the physician. How then shall we clean our hands? Not so readily as may be imagined. In the first place, handle infectious matter as little as possible and immediately after handling it, wash your hands thoroughly."

The Practitioner then gives in detail, which we need not here go into, how before examining a patient the sleeves are to be rolled up, and the hands and arms washed with a stiff brush in very warm water with soap for five minutes; then all traces of soap are to be removed and the hands bathed in a solution of corrosive sublimate; and concludes in these words: "All this takes time, but if by repeating it and taking other antiseptic precautions a thousand times we can prevent one attack of septicemia, it will be well worth our while, if only for the sake of following out the old precept of the great Physician to do unto others as we would they should do unto us." Prof. Fürbringer, gives these instructions to secure absolute sterilization of the hands: "The nails are to be trimmed and cleaned from all visible dirt before being wet; the hands and nails are to be brushed for a minute with soap and very warm water; then washed with

alcohol for a minute ; before vaporization is completed they are to be washed for a minute with an antiseptic solution consisting of a two-per-cent. solution of sublimate and a three-per-cent. solution of carbolic acid."

Solutions of corrosive sublimate may be prepared off-hand by always having ready an alcoholic solution of a drachm to the ounce. A teaspoonful of this to a pint of water makes a solution of about 1 per 1,000. It should not be used with soapy water, or with dirty or bloody hands, as it "fixes" the dirt.

Directions more in detail for antiseptic practice for nurses and others will be given on another occasion.

SLEEPLESSNESS, ITS CAUSES AND PREVENTION.

CAN you tell me doctor how it is that I cannot sleep? This is a common question, which we have been very frequently asked, as doubtless have been most other physicians. Various answers have to be given to various patients. There are many causes for inability to sleep well. Often the cause is associated with the digestion ; oftener it is in continual mental strain or worry in connection with business or study. Nothing can be done to successfully remedy the trouble until the cause is removed. When there is no mental trouble of this kind, or no head trouble, it is probably the diet and digestion that are at fault ; when greater moderation in eating, and, it may be, in drinking, and more out-of-door exercise, will give the necessary sleep.

On the importance—the absolute necessity—of obtaining sufficient sleep we need not dwell at all ; although in the words of a high authority, Dr. Forbes Winslow, we may say, there is no fact more clearly established in the physiology of man than this, that the brain expends its energies and itself during the hours of wakefulness, and that these are recuperated during sleep. If the recuperation does not equal the expenditure, the brain withers ; this is insanity. The practical inferences he adds are three : (1) those who think most, who do most brain work, require most sleep ; (2) that time "saved" from necessary sleep is infallibly destructive to mind, body and estate ; (3) give yourself, your

children, your servants, give all that are under you, the fullest amount of sleep they will take, by compelling them to *go to bed* at some regular, early hour, and to rise in the morning the moment they awake; and within a fortnight, nature, with almost the regularity of the rising sun, will unloose the bonds of sleep the moment enough repose has been secured for the wants of the system. This is the only safe and sufficient rule as to the quantity of sleep required.

Habit in this as in many other things associated with healthy living, is a great deal; habit and will power indeed are every thing. Some persons after lying down get into the bad habit of thinking in bed, instead of sleeping; a habit which is sometimes not easily overcome. In the London Lancet we find the following, which we cannot do better than quote:—"When we are weary, we ought to sleep; and when we wake, we should get up. There is no habit more vicious than adopting measures to keep awake, or employing artifices, or, still worse, resorting to drugs and other devices, to induce or prolong sleep. Dozing is the very demoralization of the sleep function, and from that pernicious habit arises much of the so-called sleeplessness—more accurately, wakefulness—from which multitudes suffer. Instead of trying to lay down arbitrary rules as to the length of sleep, it would be wiser to say: Work while it is day; sleep when you are weary, which will be at night if the day has been spent in honest and energetic labor. When you awake, rise; and if the previous day's work has been sufficiently well done, the time of waking will not be earlier than sunrise. The difficulties about sleep are almost uniformly fruits of a perverse refusal to comply with the laws of nature. Take the case of a man who cannot sleep at night, or rather, who, having fallen asleep, wakes. If he is what is called strong-minded, he thinks, or perhaps reads, and falls asleep again. The repetition of this lays the foundation of a habit of awakening in the night, and thinking of reading to induce sleep. Before long the thinking or reading fails to induce sleep, and habitual sleeplessness occurs, for which remedies are sought and mischief is done. If the wakeful man would only rouse himself on waking, and get up and do a full day's work of any sort,

and not doze during the day, when next the night came round, his sixteen or twenty hours of wakefulness would be rewarded by sleep of nine or ten hours in length : and one or two of these manful struggles against a perverted tendency to abnormal habit would rectify the error or avert the calamity."

Poisoned sleep—sleep procured by means of drugs,—cannot be too strongly condemned—of course excepting extreme cases in diseased conditions—for reasons which we have repeatedly noted. When the excessive wakefulness is caused by over mental work or worry, absolute rest and change are indispensable ; a complete holiday and change of air and scene.

PUTREFACTION AND INFECTIOUS DISEASES.

IN the British Medical Journal of January 21 is a continuation in a lengthy editorial of the discussion on this important and interesting subject, the relation of putrefaction to infectious diseases. The following is a synopsis of the article : For a long time putridity was considered to be a special characteristic of putrefaction, and Ogston separated the saprophytes [this from the Greek, signifying organisms which feed upon decomposing or rotten organic matter. Ed.] of " ordinary " putrefaction from other organisms. Koch also made it a distinction of his spirochætæ that they did not emit an odour like the comma bacilli of Finkler and Prior. But Poehl and Brieger have shown that the former yield a large amount of " cholera red," an indol derivate, and indol and its derivates are characteristic of all putrid processes. Again, Pasteur's theory of anaerobiosis made putrefaction dependent on the entrance of air. This is too absolute a statement ; the entrance of air is but one of the several conditions requisite. The opposite view of Cohn, that his aerobiotic bacterium termo is the only real saprogenous ferment, is equally erroneous. The recent proposition of Wollny that putrefaction is essentially a reduction process, and that destruction is an oxydation process, is acceptable from the chemical aspect, " but biologically can only be received *cum grano salis*." Many bacteria exhibit both processes at the same time, as Heræus (confirmed by Leone) has shown. Duncan's view is that the excitants

of pyæmia and septicæmia take “no share in putrefaction,” but he has omitted to say what constitutes their unsuitability in this respect, seeing that these organisms live in putrefying matters. Rosenbach attempted to ascertain this, and found that the differences between sapræmia and septicæmia are by no means so great as was supposed.

The fact is that the word “putrefaction” is misleading, as indicating one process, having one cause, while in reality it embraces several processes. The organisms causing putrefaction (not to mention infusoria) have now developed, as shown by cultivations, into a part of the local cryptogamic flora of a geographical district, and not only so, but the same bacteria may be modified by cultivations under various conditions, so as to exert different effects. Fitz took away their capacity of forming butyric acid from the anaerobic bacilli peculiar to the butyric acid fermentation, while their influence on albuminates remained unaltered. Professor Huppe has done the same with the aerobic “butyric acid bacilli,” and also was able to prevent the bacterium coli commune from causing the fermentation of sugar, while this organism still split up albumen, with formation of a poison. The same specific organisms may at times set up a pseudo-putrefaction, without any bad smell, and at times a true stinking putrefaction. It must be remembered that invasive organisms may act pathologically, not only by formation of poisons, but also by their mere increase.

From all this it is to be gathered that the so-called specific organisms of infectious diseases are not so specific as has been announced. The generally received opinion that filth in itself, though it may aid the spread of infectious diseases, can never cause them, requires modification. “Those sorts of filth which we meet with in putrefaction may at least contain the germs of the specific excitants of the infectious diseases, and these germs under (continued) favourable conditions may even set up the latter.” There is a kind of correspondence between the gradations from cholérine to cholera nostras and Asiatic cholera, those from epidemic icterus to yellow fever, and those from localised putrefactive processes up to the development of miasmatic or contagious diseases. Sporadic diseases may become endemic; endemic diseases

may become epidemic. It is probable that Asiatic cholera was only an endemic disease during the last century, having been previously merely sporadic. Conversely, germs may perish; the plague has disappeared from Europe. But all well-defined infectious diseases have for the time being a favourite locality, a home, and their excitant organisms can owe their original development within this locality only to local putrefactive processes; these processes, as already stated, on other grounds being of various kinds and specific to the locality. . . .

In the process of putrefaction the modes of organic life are as follows, to use Garr's nomenclature. Various kinds of organisms grow side by side, and share in the destruction of their own substratum; this is symbiosis. Others prepare material beforehand for the development of others; this is metabiosis. Others, again, struggle for possession of the field with others; this is antagonism, which may be either one-sided or mutual. But different conditions may cause the same organisms to play very different *roles*; an antagonistic organism may become metabiotic, and the latter may become symbiotic. Ultimately, persistent forms are attained, the so-called durable condition (*dauer-form*) permitting fresh development after long periods of inactivity." Dulaux kept germs in an inactive condition for twenty years, and found that when, at the lapse of this period air was admitted, they began at once to develop, that is, to share in the process of putrefaction — as even Koch's comma bacilli do for a few days. Hence the explanation of latent foci of epidemic diseases otherwise hard to trace.

In all the inductive sciences, it is no less important to arrange all newly-discovered facts in their proper sequence than to gather them by laborious experiments, and we ought not to feel disappointed if, when they apparently upset time-honoured theories, further examination reveals that they but substantiate those very theories. Such is the case with infectious diseases. Of old they were connected with filth, with putrefaction; then the microscope appeared to indicate that they were due to specific organisms, that they could be cultivated apart, that they apparently had nothing to do with putrefaction, but were even antagonistic to it,

and succumbed to it in many cases ; lastly, renewed examination of the bacteriological and epidemiological facts before us reveals that, after all, the ancient doctrine of Hippocrates had a substratum of truth.

Watson Cheyne has shown that some bacteria, which in small numbers only act locally, may in large numbers cause general disease. Further, Heube and Kitt, as regards cattle-plague, have obtained the same results with a large number of germs of a low degree of virulence as with a small number of high virulence. Again, Pasteur has shown that pathogenic bacteria undergo modifications of virulence by transmission through (susceptible) animals, the lower grades of virulence protecting against the higher. Heube, who had previously argued that the four diseases, cattle-plague, swine-plague, rabbit-septicæmia, and fowl-cholera, must be nearly related, has made a series of experiments (partly with the assistance, partly under the control, of Kitt) which not only support this idea, but show that the bacteria of these four diseases, when attenuated either by culture or by transmission, are mutually protective against each other.

It results from these general considerations that not only may a virus be strengthened or weakened by adaptation, but collateral effects may arise. In other words, modifications of bacterial action may occur in quality as well as in quantity ; hence the appearance from time to time of infectious diseases apparently new to medicine. When we also bear in mind that Salomon and Th. Smith were able to protect animals against American swine-disease by means of ptomaines as effectually as by attenuated cultures, it is evident that the boundary line between intoxication from putrefactive process on the one hand and infection on the other is done away with. Nature herself steers between the purely localistic and the purely contagious theories, and the truth lies, as usual, between the two extremes. "To admit a saprophytic stage in the existence of infectious organisms at one period or another of their phyletic existence is to admit a miasmatic stage of a localised character ; to deny it is to deny the recent revelations of bacteriology." "It is a matter of indifference," Heube continues, "whether with Pettenkofer we speak of ectogenous, or with Koch of occasional para-

sitism, with myself of a 'saprophytic stage,' with De Bary of 'racial selection,' or with Van Seighem, of 'facultative parasitism.' On the other hand, the purely 'contagious' theory is not opposed to the dependence of the infective organisms upon the outer world, as Naegelli and Pettenkofer postulate. The question whether a disease be transmitted directly or indirectly, whether it is contagious or miasmatic, depends upon the presence or absence of definite organisms (for example, spores), and upon the mode in which infection occurs (for example, by wounds, by the lungs, or by the intestines). And as far as concerns these mere pathological considerations, the broader view of Koch commends itself as the most just, namely, that infection may occur by a plurality of modes."

This comprehensive address closes thus : "Putrefactive processes are necessary as an intermediate stage between plant life and animal life, and as long as these processes go on, so long will organisms exist which, owing to their very origin, will act detrimentally on the structure of the human body, that is, will excite disease Let putrefaction then go on as far removed from human dwellings as possible, in its natural place, the ground . . . Cleanliness—a genuine cleanliness, not a merely external purity—(*Facaden-Remlichkeit*) is the best means of combatting infectious diseases, and here I adopt the English view of the subject The triumphs of hygiene are as brilliant as those of antiseptic surgery, though not so immediately appreciated Prophylactic hygienic measures against infectious diseases are worth more than all the protective inoculations, and the scepticism and reserve of Koch and Kitt, as regards the latter, are fully justified."

THE MONEY VALUE OF HEALTH.

NOT long ago Dr. Arthur Ransome, M. A., F. R. S., etc., in the Association Hall, Manchester, Eng., gave the following valuable statistics upon this subject : He said : From Mr. Neison's tables we learn that the experience of friendly societies shows an average of incapacity for work from sickness of about 2.45 weeks per annum per member for all ages between 21 and 70 years. But,

as the late Dr. Watts, in his excellent lecture of "The Loss of Wealth by the Loss of Health," remarks, we have to include, in our calculations, the less prudent men who are not members of friendly societies, and we may therefore safely assume an average sickness of $2\frac{1}{2}$ working weeks per annum.

"The heads of families in England and Wales number about 5,111,111, of whom 4,259,239 are working-class families, whose weekly wages will amount to about £5,322,675, or £887,112 per working day. Now, the heads of families do not comprise all the workers therein, but they are sufficient for my purpose. . . . We shall find from these figures that by loss of work through sickness the working men lose no less than £13,306,687 per annum; and if we add 25 per cent to that sum for the losses of employers and dealers, by lessened trade we shall find a loss to society the measure of which is £16,633,359, or £1,208,890 for each day of sickness."

Another example will serve to point the moral and to bring it home to every candid mind: "The heads of families in Manchester and Salford are about 1,111,111, the working-class families being 92,593, whose weekly wages amount to about £115,741, so that the average sickness of $2\frac{1}{2}$ weeks (this average is for the whole country, and is, therefore, much exceeded by large towns) will cost £289,352, or £19,290, for each day of sickness. For every day that this sickness can be prevented by public sanitary measures the authorities of Manchester and Salford will add to the wages of working men £19,290, and, with 25 per cent added for profits of employers and dealers, the gain to the society will be £24,112 for every day so saved from sickness. And if the sickness of the workers be lessened by public improvements in and about their homes, and by the isolation of cases of infectious diseases, the health of the non-workers will also be improved, and this will thereby save money if it does not earn it, and this prevention of sickness amongst the wives and little ones will allow the bread-winner more frequently to rest in peace after his day's toil, and to leave home in the morning with a light heart and a smiling face, and to work on through the day without anxiety about the condition of affairs on his return."

I will give you only one example out of many of the cost of sanitary work and sanitary improvement compared with the saving that actually arises from it. From Mr. Henry Whiley's paper on the "Manchester Corporation Health Department," published in the transactions of the Statistical Society of that city for 1885-6, we find that the entire cost of the Health Department, including all the outlay upon hospitals, disinfection, scavenging, &c, was under £87,000 in the year ending March 31st, 1885. The actual saving of life was 2,301 lives, about 1,000 of them between the ages of 20 and 70, or a gain of £200,000 at a rate of £200 per person. Add to this the saving for funeral expenses of about £15,000 and the gain of £50,000 that would have been spent on the treatment of 103,000 citizens preserved from sickness, and another £50,000 for the wages they must have earned, and then, at a very moderate computation, we have a gain of more than £300,000 to set against an expenditure of £87,000, a total saving of more than £200,000 in a single year.

THE POISON IN BREATHED AIR—RECENT IMPORTANT AND INTERESTING EXPERIMENTS.

FROM the British Medical Journal of January 28th. we learn that at the meeting of the Société de Biologie of Paris, on December 24th, 1887, MM. Brown-Séguard and d'Arssonval presented a note on some recent experiments made by them to prove the toxicity of the air exhaled from the lungs. They assert, first, that the air exhaled nearly always contains ammonia; secondly, this air contains, in very minute quantities, organic matter which, if not already putrefied on leaving the broncho-pulmonary passages, has great tendency to rapid alteration, even at a low temperature; thirdly, confined air charged with pulmonary exhalations is extremely noxious, even when containing only 1 per cent. of carbonic acid, with a corresponding diminution of oxygen; whereas atmospheric air containing the same proportion of CO², and a corresponding diminution of oxygen, but containing no pulmonary exhalations, causes hardly any disturbance. The authors injected into the circulation of rabbits a small quantity of

a liquid resulting from the condensation in refrigerated glass bulbs of air exhaled from the lungs of several human beings, and also from the lungs of a dog (taken from the trachea). The results were the following: More or less marked dilatation of the pupil; slower respiration; rapid decrease of temperature, varying from 1° to 5° C.; paralytic weakness, often extreme, of the posterior members; Strange phenomenon sometimes persisted for two or three weeks. On injecting double the quantity of liquid produced by condensation of exhaled air of a dog into the carotid of a strong, healthy rabbit, there was violent tetanus, with almost complete arrest of the cardiac movements and of respiration, and the animal died within a minute. It is evident that this noxious action of the exhaled air must be due to certain toxic organic substances, present in very minute quantities, not yet isolated, and the chemical composition of which is yet unknown. It is not known whether they are alkaloids, like the ptomaines; but it is evident that considering the very minute quantities in which their action becomes appreciable, this action must be very energetic.

PAIN AND RELIEF—DISEASE AND ITS TREATMENT.

A FEW months ago we gave the substance of an article from the London Lancet, by Dr. Gillies, on the "Life Saving Value of Pain and Disease." The writer's rendering or paraphrase of pain is that, "There is Something Wrong." If one takes up a hot poker, pain comes to convince one there is something wrong. If the heat has injured the skin, the pain remains till the structures are all right again or progressing favorably towards the right. If a blister has formed it constitutes the most perfect possible provision for protecting the parts beneath. Pain may continue after the removal of the cause, but this serves the great purpose of ensuring the repair of the injury. It is "the prayer of the nerves of that part for food—for the materials of repair."

Suppose one has eaten indigestible food; the stomach cannot digest it; it rebels, or rather, justly resents the injury. Spasms, cramps and colic declare that there is something wrong. "A healthy man drinks too freely of malt liquors and the heavier

wines. Notwithstanding the many warnings from his head and stomach, he perseveres in his full living, till one early morning a twinge in the great toe and a cruel pain tell him there is something wrong ; you must stop that port. He has the gout." He now calls on his doctor to "get his sewers flushed," as Dr. Alfred Carpenter puts it.

Pain on the other hand comes not when it can serve no good purpose. A man is crushed in a railway accident. If his injuries be such that he cannot recover, he suffers no pain. "Pain is our valuable stimulus or incentive to earnest effort. We may be quite sure that when we understand its meaning we can put right what is wrong and pain shall cease."

Dr. Gillies, writes : "I have under my care a young business man—a man of great force—his physiological expenditure is consequently very high. He is subject to most violent headache and acute feverish attacks, lasting from one to three days ; but in that short time he loses several pounds in weight. That man is as satisfied as I am that his headache is saving his life, for the attacks never come, but when he has overdone himself."

Most people when in pain desire only to get rid of the pain, thinking little about the cause or to what it may lead. They must have something to "stop the pain," whether this something interferes or not with the natural process of complete recovery. Kind Providence has blessed His creatures with many means by which pain may usually be directly relieved ; but great discrimination is needed that these remedies be not employed, perhaps for the relief of the slighter pains only, when they may retard the natural healing processes. If a pain is very great, it should be relieved as quickly as possible ; but relieved with THE REMEDY MOST SUITABLE TO THE OCCASION—with that which is best adapted to the special locality of the pain and to its cause. Some persons are altogether too ready to resort to "pain killers," and such for the relief of pain. Such as in the stomach from indigestible food, or in the head from over work or worry ; and some of our Medical exchanges intimate that some physicians are too much disposed to treat symptoms in this way, and obtain present relief without due regard to future consequences. If one supposes that by a

dose or more of a "pain killer" he may get rid of his pain in his stomach or head, and go on eating indigestible food or over working or worrying his brain, he will find out soon or later, alas ! it may be, when too late, that he is awfully mistaken.

Not long ago, at the Albany Medical College, Dr. Henry Hun, made the following remarks bearing upon this subject :—
"The cloak of mysticism has never been able to entirely envelop scientific medicine. There is an idea of medicine which has existed from the earliest times, and which has become more and more prevalent, until now every educated physician believes it ; and that is, that diseases are self-limited, and that the human system possesses within itself a power to cure disease. That is a truth, I think, which lies at the foundation of all medicine. When an injurious or noxious thing acts upon a dead body and a living one, the former remains as passive as a block of wood, while the latter reacts with a whole chain of phenomena, which we call disease, but which is really the way in which the body recovers itself from the injury inflicted upon it and becomes restored to health. The dead body does not react, because it is dead, and has no recuperative power ; the living body reacts, and thereby continues to live and overcomes the injury inflicted upon it. A machine or instrument may get out of order, but it cannot be diseased. Nothing but a living being which has recuperative power can suffer from disease ; for the essence of disease is a struggle of a living being against some noxious influence. This idea of disease reveals the great object of medicine, which is not to combat the symptoms of disease, but to aid the body, if possible, in the struggle in which it is engaged, and from which it would, if left to itself, in many cases, issue victorious."

It is doubtless, often better to bear considerable pain for a time than to too readily resort to any medicines which simply relieve pain, such as opiates, anodynes, hypnotics and the like.

NOT SCARLATINA.—From Prof. Crookshank's researches it now appears that the so-called Hendon Cow disease does not give rise to scarlatina in man after all. We may next hear from Dr. Klien, who may have been in some way misled.

INTERNATIONAL SANITARY LEGISLATION AND NOTIFICATION AND QUARANTINES.

AT THE Sixth International Congress held in Vienna in October last, a great deal was said against quarantines. It is not to be supposed that the antagonism of the Congress was to practical quarantines as now practiced at some sea-ports on this Continent, but rather to land quarantines and sanitary cordons between adjoining countries, such as had been adopted and practiced in Europe. Prof. Von Pettenkofer, however, and others expressed the hope that the system now practiced in England would soon be altogether abandoned. England herself, *en passant*, as we endeavoured to show some months ago, depends now very much more on internal sanitation or cleanliness than on quarantine. Dr. Mosso, of Turin, stated that the preventive measures that had been taken in Italy in 1884—cordons, quarantine, isolation—had completely failed to check the cholera, while causing much inconvenience and suffering to the country, and that the epidemic of last year, without such precautions had run a milder course. But this last fact alone is of little value as against such precautions. Many causes might have contributed to so modify the epidemic.

An international system of compulsory notification would unquestionably be of great value, and it is to be hoped it will be carried into practice throughout the civilized world before many more years have elapsed. The Vienna Congress carried the following resolution by a large majority :—

“That an international convention should be arranged between the different States for their common protection against cholera, yellow fever, plague, etc., the said convention to be based on the following principles :—1. Compulsory notification of each case of the above-mentioned diseases to be made without delay. 2. In a neutral European State an office should be established which should be a centre of information to which the first cases of epidemics, and regular accounts as to their course, should be forwarded by telegraph ; these accounts should then be transmitted by the office to all the States which participated in the convention. 3. The convention should lay down rules for the proper

sanitation of sea-ports and centres of commerce, etc. 4. The States taking part in the convention should take all necessary steps to prevent the shipping of persons or goods from localities in which any of the above-specified diseases were prevalent. 5. Vessels arriving from infected places should be so arranged that the patients could be isolated on board, and the necessary disinfection performed. 6. Ships coming from infected places should be submitted to a medical examination at the port when they arrive. 7. When cases of cholera had occurred on board the ship, the patients should be disembarked and isolated, and those who were suspected should be kept under observation until the true nature of the disease was established. 8. The ship should be kept under observation until disinfection had been duly carried out, and it was certain that no epidemic was to be met with on board the ship. 9. At the ports of the Suez canal an international board of medical supervision should be established, and the officials appointed by the Sanitary Council of Alexandria."

If every State and Province and locality would do its plain duty in regard to preventing epidemics, there would be but little necessity for sanitary cordons or quarantines (The term quarantine is indeed becoming somewhat misleading). But when any such will not do its duty in this regard, what is to be done by neighboring States or localities? As an eminent Sanitarian said recently to the writer, establish a "shot gun" quarantine?

IMPORTANT POINTS IN VACCINATION.

THE practice of vaccination for small-pox, while it has many opponents, even in the medical profession in England and on the Continent of Europe,—but very few physicians on this Continent being opposed to it—the great mass of the profession everywhere are in favor of it, and consider it a most valuable and effectual prophylactic. The disrepute into which the practice has fallen is chiefly due to want of special care, and particularly on the part of the vaccinator. It has been too much the practice to consider that every one should be vaccinated, and to have the vaccination performed as universally as possibly, however, per-

functorily it might be done. Sometimes lymph or scabs from diseased or bad subjects, lymph from old decomposing scabs, or a foul or septic lance has been used in the operation by vaccinators not having a due regard for the importance of the operation.

It cannot be too strongly impressed upon every vaccinator that the object is *not* simply to vaccinate, but to vaccinate in a most perfect and careful manner in every case. The authorities such as Health Boards, who employ public vaccinators should feel their responsibility, and not only exercise discrimination in the appointments, and not be influenced by political or other favoritism, but should in certain cases exercise a measure of oversight, and especially have a care that a sufficient supply of perfect virus be always provided. The responsibility, however, of the whole measure must rest chiefly with the vaccinator—with his medical knowledge. He should refuse to use any but the best obtainable virus, either clear transparent lymph from the arm of another subject in a perfectly healthy state, on the eighth day, before the inflamed areola appears, from properly and carefully selected fresh crusts, or from unquestionable points, human or animal. The lance after every operation, excepting when more than one are done at about the same time, must be carefully cleaned and dipped in boiling water or cleansed with a strong antiseptic solution.

That serious diseases have been inoculated into the healthy human body along with humanized virus cannot be doubted, and as the responsibility of any such accident must rest with the vaccinator, he should exercise the utmost care. There is no doubt but that septic poison may be communicated by a dirty or impure lance, or quite possibly from an old or decomposing crust.

Humanized virus, it may be observed, takes more readily, runs through its course in a shorter time, and will retain its active properties for a longer period than animal virus. If the physician himself collects humanized lymph from a proper source, he knows that it is pure, but with animal lymph from the cultivators of it, he cannot be so certain of its purity. He will not neglect to bear in mind that if the child or other subject to be vaccinated has any cutaneous disease or disorder of the system

the vaccine will not be likely to "take," and that any such obstacle should be first removed.

As the *British Medical Journal* (Feb. 11, 1888), says: "Apart from the question of decreasing protection, it is important that the operation should be performed in each case before the actual business of life is entered upon. If it is not so performed it is likely to be indefinitely postponed, if not altogether forgotten, until a scare of small-pox increases the applicants for revaccination, strains to the utmost the resources of the public vaccinators, and increases the risk of the operation being inefficient.

"We would venture to impress upon Boards of Health the importance of promoting revaccination systematically during non-epidemic periods much more than has been the practice hitherto. Practically no efforts have been made in the past in this direction, except in the presence of small-pox, and consequently revaccination is by no means as general as the public welfare requires."

MICRO-ORGANISMS IN THE AIR OF ROOMS—REMARKABLE RESULTS OF EXPERIMENTAL RESEARCH.

That the micro-organisms do not come from the breath was shown by experiments, the details of which we need not describe. That they do not come in any large number directly from the clothes or skin of the persons present in a room was shown by a number of observations made in the two chemical lecture rooms. Even during a course of crowded popular lectures there was found to be an average of only four micro-organisms per litre, as compared with an average of about three when the room had remained empty. Nor did the number rise beyond six per litre when the room was left unventilated during the lecture, and the carbonic acid rose to nearly 40 volumes per 1,000. This observation alone shows that the carbonic acid is no measure of the number of micro-organisms in the air of a room.

It was therefore concluded that micro-organisms come from the floor and other parts of the room itself. If this is really so,

the state of a room as regards cleanliness ought to have an effect on the number of micro-organisms. This was found to be actually the case, as shown in the following classification of both schools and houses :—

		No. of cases	Average space per person	Average carbonic acid	Average organic matter	Average micro-organisms
One-roomed houses	Clean.....	1	295	8.0	13.1	18
	Dirty.....	7	200	9.9	18.1	41
	Dirtier.....	13	221	10.7	13.5	49
	Very dirty..	6	220	11.0	15.1	93
Two-roomed houses	Very clean..	2	273	12.5	10.8	10
	Clean.....	4	264	9.3	7.7	22
	Dirty.....	7	233	9.4	11.2	69
Naturally ventilated Board Schools	Cleaner...	12	167	19.7	18.1	91
	Average cleanliness	12	166	14.2	16.2	125
	Dirtier....	12	191	22.5	15.2	198
Mechanically ventilated schools and college .	Cleanest ..	7	194	12.5	12.7	3
	Clean.....	11	155	12.8	8.3	10
	Less clean.	4	152	10.8	9.8	30

They next classified the schools according to the age of the building, and obtained the following results :—

	No. of cases.	Micro-organisms per litre
Opened before 1886.....	7	211
“ 1875-1880.....	20	150
“ 1884-1885.....	5	38

This, Mr. Haldane says, was not at all what we expected to find. One would rather have anticipated that the micro-organisms, like the ordinary dust particles in a room, would very soon reach a maximum, depending on how often the room was cleaned. But the causes under the action of which a room becomes infested with micro-organisms are evidently no merely temporary ones, but have a gradually cumulative action. Further investigations on this point are now being carried out by Professor Carnelley.

At the time when the results of our analysis led us to this important result, he continues, we were unaware of the very interesting researches made recently by Dr. Emmerich, of Leipzig. He made a large number of analyses of the damping material used for filling up the space between the ceiling of one flat and the floor of the flat above. He found an almost incredible pollution of this material. His analyses show that, to use his own words, "there exists nowhere in nature, not even in the neighborhood of human dwellings, a soil so highly contaminated with nitrogenous organic substances and their decomposition products as the damping material under the floor of dwelling rooms." The amount of chloride of sodium found in this material was on an average seven times greater than that found on the ground under leaky cesspools, and twelve times greater than that found in the soil round a dung hill, although this soil was visibly soaked with filth. When the coarse pieces of stone were separated from this material it was found that the finer dust and sand which was left contained even more nitrogenous matter than human excrement. "In the damping material of a single room there was usually more excremental matter present than in a large cesspool." That all this filth is alive with micro-organisms is shown by the amount of the products of decomposition which result from their activity. Thus, under the floor of one single room Emmerich found that there were more than 6 cwt. of nitric acid in the form of nitrates. He also showed that the carbonic acid in the air of rooms left shut up and empty increased, although all other known sources of carbonic acid, such as subsoil, air, &c., were excluded. The chief cause of this contamination was undoubtedly the soaking of fluids and shaking of dust through the fissures and spaces between the boards in the floor. . . . There seems no reason to doubt that a very similar state of pollution exists in the damping material of English houses.

Emmerich followed up this research by another no less interesting one in connection with the same subject. In a prison at Amberg there had persistently occurred for years epidemics of croupous pneumonia. The last of these had attacked every seventh and killed every twentieth prisoner. As is well known, the late

Dr. Friedlander, of Berlin, discovered the presence in cases of croupous pneumonia of a species of bacterium, cultivations of which, when inhaled by, or inoculated into, certain animals, produces a similar disease in them. There can thus be little doubt as to the casual connection between this organism and the disease, or at any rate certain forms of it. Emmerich examined the damp material from the infected rooms in the Amberg prison. He not only found this material full of organic matter as usual, but actually discovered Friedlander's bacterium in enormous numbers.

To return to our own researches, it seems very likely that the progressive contamination of the material in the floors, and perhaps elsewhere about the room, may be connected with the progressive contamination of the air with micro-organisms. Emmerich's researches throw a vivid light on the manner in which this progressive contamination may affect the health of the inhabitants.

On another occasion we may give a synopsis of the report on the investigations on the air of sewers, which was found to be surprisingly free from micro-organisms; because probably, as shown by Prof. Nageli, of Munich, these organisms, like other particulate matter, are not given off by moist surfaces.

DISEASES OF DOMESTIC ANIMALS, THEIR RELATION TO THE HUMAN FAMILY AND HYGIENE.

FEW subjects relating to the public health or, indeed, to the growth and profits of agricultural stock, are of greater importance than the hygiene of domestic animals and the relation of the diseases of these animals to mankind. It is constantly becoming clearer and more evident that the ordinary diseases which prevail among horned cattle, sheep, pigs, horses and even poultry are for the most part caused by unhygienic management and surroundings, and that many of these diseases—the infectious ones—are more or less communicable, not only from the animals to man, but also conversely—from man to the animals. It has long been known that those terrible diseases, hydrophobia, glanders and trichinitis, are common to both man and animals; and it is now fully and, I believe, universally recognized that the tubercular

disease in animals is identical with tubercular consumption in the human organism, and that the disease is communicable from the one class of beings to the other there is overwhelming evidence. Vaccinia, or cow-pox, is common to both human beings and the cow, and, it seems also, to the horse. Recently a case of true Jennerian or natural cow-pox in a boy was discovered by Prof. Crookshank, of King's College, London, Eng.; a calf was innoculated with the virus from a pustule in the lad, which developed in the calf into well marked cow-pox. There is now evidence (Dr. Stickler, in the N. Y. Medical Record, Dec. 10, 1887,) that foot and mouth disease, or aphthous fever in cattle, and scarlet fever bear the same reciprocal relation to animals and human beings as do cow-pox and small-pox; indeed, that they are virtually one and the same disease—having origin doubtless in the same germ in a somewhat modified form. But recently, too, in France, Prof. Verneuil has put forth the hypothesis, supported by numerous facts (Annals of Surgery, January, 1888), that tetanus, commonly called lock-jaw, is an infectious disease derived from the lower animals, particularly the horse. In the February number of the American Lancet is a communication from Dr. Billings, of the Patho-biological Laboratory of the Nebraska State University, from which it appears probable that the germ or infection of the Southern cattle and swine plague belongs to the same group as that of yellow fever, and the two are quite possibly identical. There is strong evidence that birds and cats may take diphtheria from a human subject affected with this disease. Late investigations of Klebs, Ferrand and Tessier show that manure heaps play a considerable part in propagating diphtheria. An army surgeon, M. Longuet, has tried to prove by statistics how far this theory is correct, and has collected the following facts (Sanitary Record, London, Eng., January, 1888.) :—In the French army the deaths from diphtheria in the cavalry regiments are treble those in the infantry. It is most prevalent in the cavalry barracks in Paris, which are in the vicinity of stables belonging to the Paris Omnibus Company, and of a large depot for manure. In the German army the proportion of cases of diphtheria among the cavalry, as compared with the infantry, is the same as in the French army.

In the Austro-Hungarian army cases of diphtheria are rare, but they occur principally amongst the cavalry regiments. Much has been written on this point, too, by investigators on this continent. In England, some months ago, Dr. Tanner presented to the Local Government Board a report on the subject of diphtheria in animals, especially pigeons and fowls, and gave many instances in support of the communicability of the disease to man. He had noticed a similar disease in swine and horses, and in cats. At Yately diphtheria was in two instances coincident in the human subject with strangles in horses. Similar instances had been noticed by Dr. Ogle in connection with sheep.

Such facts should awaken the deepest interest in all interested in the welfare and progress of the country. While a great deal of attention has been given by agriculturalists and by governmental bodies to the diseases, mostly parasitic, which affect the vegetable products of the farm, and the causes of the failure or destruction of cereal and other crops, together with the means of removing these causes, comparatively little effort has been put forth, especially on this continent, with the view of preventing disease in domestic animals. And while the diseases of animals, so frequently fatal, constitute a subject of very grave import as they relate alone to direct profit and less to both individuals and the country, when the communicability of these diseases to mankind is taken into consideration, the subject becomes a most serious one.

A field hitherto but little cultivated is therefore opened up in which local boards of health may work with much profit. Many who are very apathetic in regard to health as it relates to only human creatures, will become fully awakened when danger threatens their domestic animals.

Animals require pure air, pure water, good wholesome food, exercise, sunlight and other essentials of health just as much as do mankind; yet how universally are many of these essentials denied them. Cows and horses especially are housed in small, dark, dirty stables, often made as close and secure as possible against the entrance of fresh air, and without any special means whatever of ventilation; and it is a common practice to provide them with water from wells near the stables and manure heaps, strongly contaminated with washings from their own excreta.

No fact is perhaps better established than this : that a very large proportion of the diseases which affect the human family is caused by the excreta of the human body—from the lungs, skin and bowels—getting back, in a decomposing septic condition, into the body again. Most infections obtain access to the body in this way. It seems to be clearly established, too, that the re-breathing of air once breathed, as in unventilated apartments, is an essential, powerful and common pre-disposing cause of tubercular consumption. The same doubtless holds good in every respect with regard to animals, as with man. Disinfection of excreta and isolation should therefore be practiced in connection with all infectious diseases of animals, as well as with those of man.

Many complain, often to the health department, about a dirty neighbor, but heed not that another one miles away may supply them with milk, beef and poultry contaminated with the infection of scarlet fever, diphtheria or typhoid, or containing a deadly tubercular virus. Doubtless many cases of disease attributed to sewer gases are caused by animal foods contaminated by means of the unsanitary conditions with which the animals were exposed or surrounded.

Before concluding we will briefly note a few points in connection with consumption ; a disease which has been experimentally communicated from man to animals and from one animal to another, and which, it is hardly doubted by anyone, may be communicated, by means of milk or flesh, from animals to the human body. This disease causes about one-seventh of all the deaths which take place in civilized countries, and on this continent alone, every year, destroys the life of about 200,000 human beings. We have had direct communication with many prominent and experienced veterinary surgeons, of whom the almost unanimous opinion is that the disease is becoming common, increasing in frequency, among cows ; indeed, that it is increasing to an "alarming extent" among the better grades of horned cattle, which are usually confined more indoors in cold weather and are hence more exposed to infection. The almost unanimous opinion of the medical profession now is that this disease is preventable, probably as much so as any other infectious disease. Yet, in this age of humanitarianism and flourishing societies for the prevention of cruelty and preservation of life, brute and human, where is there a hand put forth to check in any special way the spread of this terribly fatal disease among either human beings or animals ?

THE PUBLIC HEALTH FOR JANUARY.

THE total record of deaths in January in the twenty-six cities and towns in Canada which make monthly returns to the Department of Agriculture in Ottawa, was 1,475, or greater by 34 deaths than the record for December.

This is in accordance with the usual gradual rise, from month to month, from November, after the autumn fall from the high summer mortality, on to March and April, when one of the usual high points in the yearly wave of mortality is reached; the other high point being in July and August.

The only notable changes in January in the totals were a large increase in the mortality in Quebec and considerable of a decline in that of Ottawa, Hull, Winnipeg and some other places.

There was a further decline in the mortality from measles, although Charlottetown seems to have been afflicted with an epidemic of this disease.

From scarlet fever there was also a decline. The epidemic in Winnipeg seems to have abated; although there were seven deaths from the disease recorded there.

From diphtheria there was likewise a decided decline, from 172 deaths in December to 150 in January; although in Toronto there was an increase from 14 deaths in December to 23 in January, with fewer deaths in each of nearly all the other places.

The record of deaths from typhoid fever declined from 57 in December to 21 in January. Of these 21 deaths in January, seven were in Ottawa, five in Montreal and four in Hull.

Few will believe that the drainage and sewerage in Ottawa are so much worse than in other cities as to account for this continued great difference in the mortality from this disease, even if the disease were commonly caused by sewer gases, which the best authorities dispute.

From zymotic diseases, the total number of deaths recorded in January was 260; a decline from 332 in December. In Toronto, however, and Quebec there was a large increase under this head.

With a decline in the mortality from the zymotic class of diseases as the season becomes colder and checks decomposition, there is usually an increase in that from the other classes. Hence we find in this case also an increase in January in the number of deaths from all the other four classes; even in deaths from violence there was an increase, from 38 to 43; 19 deaths under this head having been recorded in Montreal.

THE EDITOR'S SPECIAL CORNER.

SELF-CONTROL is perhaps of all habits or traits of character the one most worthy of cultivation. Not only do moral and spiritual welfare depend largely upon it, but the physical well-being—health—is to a very great extent indeed dependent upon self-control—control of the appetites and passions. In proportion to its power is the man enabled to manifest his manhood and the woman her womanhood. The ability of the individual to draw all the lower parts of human nature upward into harmony with the best in that nature is the one great power for which to strive. The habit of self-control as someone has written it “is but the repeated authority of the reason over the impulses, of the judgment over the inclinations, of the sense of duty over the desires,” and is in short “the accumulation of continued acts of self-denial for a worthy object.” That object may be another human creature—ones neighbor—or oneself. How to develop this habit in the child may well be the study and effort of every parent, and how to cultivate and strengthen it in the individual self may well be the aim of every boy and girl and man and woman.

WITH the spring season comes the day or time, usually a succession of days, which most people have a great dislike for, that is, the “house cleaning” time. But few indeed in this age are the households in which this period with its renovating process and all its discomforts is not considered an absolutely essential semi-annual or at least annual requirement. And of nothing perhaps can it be said with greater force than of this process, “if it is worth doing at all it is worth doing well.” Few probably realize the importance from a health point of view of this periodical renovation of the dwelling. The vast quantity of waste excrete matter from the skin and breath for the most part noticeable in the form of “dust,” which will accumulate in a few months, even with frequent sweepings, in a dwelling occupied by an average sized family, is to many surprising. “It is wonderful,” the housewife will remark, “where it all comes from.” And with the exception of a little dust and ashes from the fuel burned and particles which chance to be carried in on the boots and other articles of apparel, it mostly comes, especially during the cold season direct from the bodies of the members of the family. Even if there have been no sickness in the family, it is most desirable that all this waste, every particle of it, be removed from every crack and corner and ledge. It is no small job in any house and needs time and care and force and soap and carbolic acid.

Some special points there are in reference to “house cleaning” which are not generally enough known and acted upon. Two of these however bear upon the construction of the floors and walls and are beyond the house-keepers control. These sweepings, dust and waste of whatever sort, collected in the cleaning should not be thrown in the yard or out-of-the-way corner, but should all be burned. Carpets and rugs should be taken a good distance

away from the dwelling, as to a large field, to be shaken and beaten. It is surprising that municipal authorities permit, as some of them do, carpets to be beaten in towns and villages in vacant lots quite near to dwellings. Windows are commonly open at such a time, and the objectionable excremental dust from the carpets is often in such cases blown directly into neighboring houses. The floors and walls of dwellings should be so constructed as to be impervious to moisture and dust. Those who have read the valuable paper in this and the previous number on micro-organisms in the air of rooms will readily understand how important it is that floors should be absolutely dust proof. A layer or two of good paper under a carpet will help greatly to prevent dust getting into the cracks of ordinary floors. The ordinary plastered walls absorb the moisture of the breath with its poisonous contents and all walls should be made impervious to moisture and of such material as to permit of being well washed. With impervious walls and floors and no cracks at joints or elsewhere, a house can be perfectly cleaned, otherwise it cannot be.

SUBJECT as we all are in our intercourse with society to receive into our body at almost any time, the microscopic organisms which constitute the infections of disease, any facts relating to the nature of these organisms can hardly fail to be of interest to all intelligent readers. There is a great deal yet to be learned in regard to the bacteria of infectious disease, yet almost daily new and important facts are being brought to light for the benefit of mankind. No part of the subject is of greater interest than that which relates to the manner in which these organisms "take root" in the body, and which explains how it is that while, on exposure to infection, some contract the disease and others escape. The fact is, as Watson Cheyne, F. R. C. S. (Surg. Kings Col. Hospital, Lond. E.) said the other day in a lecture at the Royal College of Surgeons, Lond., in these diseases we have two opposing forces—on the one side the bacteria, on the other the body, and these forces are by no means always equally matched; nor do they always bear the same relation to each other in different species of animals. In some animals the bacteria are more powerful than the body, the resistance on the part of the body being scarcely, if at all, evident; in other species of animals the same bacteria are much weaker than the body, and if they chance to succeed in entering the animal organism, they only do so by the aid of other conditions, and when these conditions cease to act the bacteria again die out. Inoculate guinea-pigs with tubercle bacilli and we constantly produce a rapid and general disease which has little or no tendency to remain localised, and no tendency to undergo spontaneous cure. On the other hand, in man, we see that opportunities for infection with tubercle bacilli are frequently present without being followed by infection; that the disease assumes a variety of forms under a variety of external conditions; and that it has comparatively little tendency to become generalised, but has a strong tendency to get well.

IN most cases it appears the organisms are not of themselves able to set up action and disease. What is their fate when they fail to get the upper hand?

Apparently they are rapidly destroyed in the blood and disappear ; possibly they are excreted through the various glands. Ogsten states that in septicæmia (blood poisoning) in man, the micrococci are present in the blood and are excreted in a living state by the kidneys, being so found in the urine. This is confirmed by von Eiselsberg. The rapidity with which some organisms disappear from the blood as Cheyne says is very remarkable. "It is a matter of minutes, or certainly of an hour or two." This disappearance "must be due to an active destructive action of the constituents of blood" on the organisms ; "mere unsuitability of soil is not sufficient to account for the rapidity of the phenomenon." The mere arrest of the organisms in the circulation, although an important factor, is not usually enough to lead to the production of the disease. Inject a considerable number of pyogenic cocci into the circulation of a rabbit, kill it within 24 hours, and it will be found that masses of organisms are present in the capillaries of the lungs and other organs of the body; but allow such an animal to live for forty-eight or seventy-two hours, and it will be found that the organisms have disappeared from the various organs, with the exception of the kidneys. Experiments show that when the vitality of a part has been lowered by cutting off the blood supply for even a short time, organisms grow in that part much more readily and luxuriantly. In fact all goes to show clearly, as we have repeatedly said, that whatever lowers the vitality favours the development of the infections or disease. So long as the body is healthy and vigorous there seems to be little danger from most of the infections.

OBSERVATIONS AND ANNOTATIONS.

MR. COLBY, the Wall street banker, the *Annals of Hygiene* relates, all though over seventy years of age, looks like a man in his prime. He walks every day from Murray Hill to Wall street and back, a practice forty years old, and three evenings a week he spends in active exercise in a gymnasium. In summer he swims daily in the Harlem river, and dives like a boy. We should like to know something about his dietary.

A MAN is reported to have died from glanders in St. Petersburg who had never kept nor came in contact with a horse, but whose face, while he was crossing the street, had been bespattered with foam from a passing cab horse ; the symptoms of the disease appearing soon after.

FROM many experiments on dogs, Dr. Jaroshevsky, (*Med. Oboz.*) concludes that strychnine is a powerful prophylactic against alcoholism.

ALBUMINURIA, with fatal destruction of the kidneys, is another of the many evil effects of sewer gas poisoning. Dr. Geo. Johnson, F.R.S., Prof. and Consulting physician King's College Hospital, reports (*Brit. Med. Jour.*) a number of cases of kidney disease which clearly seemed to have been caused by exposure to sewer gas. He hopes "the cases may serve to direct more general attention to this frequent, though often unsuspected, source of renal disease."

THE Austrian Minister of Public Instruction has forwarded to all school authorities instructions as to the carrying out of disinfection, based on the recommendations of the Superior Sanitary Council.

THE candy makers of New York are being scandalized. It appears certain of them, after getting up a name for making pure candies, now trade upon it and supply, especially to the country trade, inferior goods. Consumers must beware.

A NEW disinfecting apparatus for the disinfection of all books that have been out, is now in operation in the Sheffield (Eng.) free library. As a very high degree of heat is injurious to books the apparatus is on the principle of the vaporization of carbolic acid at a temperature of 150° to 200° F, to which they are subjected for 15 minutes, when they are "sweet" and "clean" and "in every way improved."

AMENDMENTS of the Public Health Act, England, has been urged, and is likely to be carried, probably in the present session of Parliament, in reference to sleeping rooms and the general structure of dwellings, also the inspection of houses during construction, that no improper materials should be used; to prevent pollution of water courses; the licencing of common lodging houses; increased powers against offenders of the Pure Foods Act; and extended powers for the notification of cases of infectious disease.

DR. BELL, of the Sanitarian, writes to state that, in reference to our remarks on the N. Y. Quarantine in our last issue, he did not say that the state executive was responsible, but simply that the Quarantine authorities gave this as a reason for the disgraceful condition of the system.

DR. BURROWS, Med. H.O. of Lindsay, Ont., president elect of the Association of Executive Health Officers, at the late annual meeting of this Association (Feb. 14-16) read an interesting address on the Commercial Value of Sanitation. He said, taking the figures of Dr. C. L. Dana, there are in the United States 1,500,000 daily sick throughout the year, involving a loss of \$142,500,000. We purpose noting some other points on another occasion.

GOOD sanitary progress has of late years been made in Liverpool, Eng. The infant science, with systematic inspectorial and constructive work, have reduced the mortality there from 36 per 1,000 of population per annum in the decade ending 1850, to about 23 per 1,000 in 1887. In 1861-70 it averaged 32.5 per 1,000; in 1871-75, 29.5; in 1876-80, 27.5; in 1881-85, 25.7; in 1886, 23.7; and in 1887, 23.1.

INJURIOUS fungi, it is said, have recently been brought into the market in certain localities as mushrooms, and a number of cases of severe illness have resulted.

AN experienced physician makes objections to the luncheon boxes and baskets in common use, as they become in a little while contaminated and give off bad odors.

A LARGE number of cases of dental irritation as a cause of epilepsy are detailed by Dr. Brubaker, of Philadelphia, in the Therapeutic Gazette of January, 1888.

BALTIMORE charges that an outbreak of diphtheria in the Italian quarter there is owing to negligence at the New York Quarantine.

ON CURE, Dr. Thomas, sen. physician Sheffield (Eng.) Hospital and lecturer on medicine, says (British Medical Journal, Feb. 4, 1888): "I believe that the physician who is most likely to cure his patient is the one who, having satisfied his mind as to the exact condition of his patient, does his utmost to find out what has brought on the complaint, and having found out the cause, is firm, and if possible compels his patient to avoid it. By avoiding the cause of a disease much is done toward the cure."

To obviate unpleasant or irritating noises, Harper's Bazar gives the following: Place a bit of spermaceti ointment about the size of a pea, tied up in a small square of fine linen, in the ear, working it around till it takes the shape of the orifice. leaving the end to hang out, not a murmur of sound can be heard.

THE Canadian Marine Department are making preparations for a test of line-throwing apparatus to be used in the life-saving service of the Dominion. The test is to include experiments with English rocket apparatus, the Tyle Gun, used in the American service, and the company's patented gun.

THE advertising and sale of patent, secret or proprietary medicines, according to the Medical Record, is absolutely forbidden in the German Capital.

DR. SHEARS in the Medical Visitor says he has never seen a case of epithelioma (cancer) of the lip in a non-smoker. He alludes to 77 cases in the Massachusetts Hospital, nearly all of whom smoked; four were women, three of whom were known to smoke. Other observers are of a like opinion.

DR. ZIGGLER, of Philadelphia, in a lengthy paper on tobacco (in Sanitarian), concludes thus: In every land and clime where the use of tobacco prevails it causes degeneration, degradation, debasement—physical, mental and moral—disease and death, or individual and national decadence.

It is announced by Dowens and Blunt that light is very inimical to bacteria and other organisms of this kind and that under favourable circumstances may completely prevent their development.

A CASE is recorded by Dr. Brown in the Medical Advance, in which a stranger in a small town, wanting the advice of a physician, went to the post-master and learned which of the physicians in the town received the largest number of medical journals, and then sent for him.

A GOOD suggestion has been made by Dr. Stearns, of Monroe, Mich. through the Medical World, that a distinctive dress, part of dress or badge be worn by physicians, that they may be easily recognized. Much could be said in favor of a distinction in the dress, and we strongly support the suggestion.

In the Health Journal (Manchester, E.) for January, the editor writes: "The demon Deterioration is truly a formidable monster, whose body is

Ignorance, and whose legs are Drink and Immorality. Its food is Filth, and it thrives on air polluted by Smoke and Noxious Vapors. Its paramours are Selfishness and Indifference; its progeny Disease, Poverty, Misery and Crime.'

AT a recent meeting of the Académie de Médecine, the N. Y. Medical Times says, Prof. Lemmola in an exhaustive paper maintained that in Bright's disease the skin, and not the kidney, is the first organ to be affected.

FURTHER evidence of the germless condition of Mid-Oceanic air has been given by Prof. Dennis, of New York. A vessel with all necessary appurtenances cruising about in mid-ocean might constitute a good sanitarium.

NOTHING like easy circumstances for promoting longevity. Dublin statistics, according to Dr. Grimshaw (Reg. Gen'l, Ireland), show that life among the professional and independent class is two and a half times longer than it is among the general service class. Among the latter there are more children, which in a measure accounts for this.

DR. STICKLER, of Orange, N. J., in the Medical Record, gives instances in which he inoculated children with the virus of foot and mouth disease in cows as a preventive of scarlet fever; also other instances in which the inoculation was done with the contents of a vesicle produced in a calf by inoculation with virus from a case of scarlet fever. Both kinds of inoculation seemed to have a prophylactic effect.

DR. BAKER, of the Michigan State Board of Health, in writing relative to the persons who brought scarlet fever to Sutton's Bay, Mich., and who came on the s. s. Ohio, to New York, said: "Is it not time that the whole subject of quarantine were investigated by the States, and by the Government, with a view to protecting the people of this country from the introduction of the really dangerous diseases?"

FROM the Epoch we learn that his holiness the Pope, although approaching fourscore years and an incessant worker, breakfasts on an egg, with fruit, bread without butter, and chocolate; and dines, on other than 'fish days,' on a small dish of soup, one dish of meat, fruit and a part of a glass of light wine: the daily expenses of his table amounting to about \$1 in winter and 60c. in summer.

A FAMILY in Brooklyn sued that city for \$10,000 because of a neglected sewer which emptied back of their house and which caused severe illness in the family. The court awarded \$1,075.

THE Bidet is a closet appendage that is so essential to elegance and even, cleanliness that it is very singular it is not in more general use. It is not expensive, and is a valuable remedy in some morbid conditions of a relaxed or hemorrhoidal character. They may be obtained of the United Brass Co., 79 Fulton St., New York.

A BERLIN Physician, Frantzel, reports that smoking may not affect a person for many years and that then heart trouble will be suddenly manifested.

THE severe epidemic of enteric (typhoid) fever which prevailed at Iron Mountain, Mich., last summer, in which there were 350 cases with 10 per cent. of fatalities, all arising, it appears, from one imported case infecting the already impure water of the town, has been investigated by Dr. Vaughan, of the Laboratory of Hygiene of the Michigan University. His experiments are highly interesting, and appear conclusive.

FLASKS of sterilized meat preparation were inoculated with Iron Mountain water and other flasks with suspected water from a Lansing well, while others were not inoculated at all. The flasks inoculated with the Iron Mountain water became strongly alkaline and were reduced to a syrupy consistence. A few drops of the syrup injected into cats soon increased the temperature two or more degrees. Injection of potato culture caused ulcers in the intestines of a cat. That the water contained the typhoid bacillus was demonstrated by physiological experiment, potato culture and microscopical examination.

EBERTH'S oval bacillus, now believed to be the germ of typhoid fever, is as large as the red blood-corpuscles of man, and about three times as long as broad, though sometimes growing to long threads. Whether or not this germ produces spores is a question of much interest. Gaffky has found them in certain cultures, kept at the temperature of the human body, and Sternberg and others have confirmed it. Others have not been able to find spores. Germ-spores resist disinfectants which destroy germs. Another point of interest is the capability of this germ to resist high and low temperatures, as shown by Prudden, who succeeded in growing them after they had been frozen in ice 103 days, and after they had been heated to 56° C. (San. Rec., Feb., '88.) This confirms the belief that typhoid fever may be induced by the use of impure ice.

FROM recent experiments, Prof. Botkin (*L'Union Med. du Can.*) asserts that:—Bitters diminish the digestive powers, retard digestion, and diminish the quantity of peptones. They diminish the secretion of the gastric juices; if they produce a feeling of hunger, it is only by irritating the gastric mucous membrane. They have no influence upon the secretion of the pancreatic juice or the bile. Nor do they diminish, but actually promote, fermentation in the contents of the stomach. From all this, contrary to current views, bitters are of no use in the treatment of disorders of the digestion.

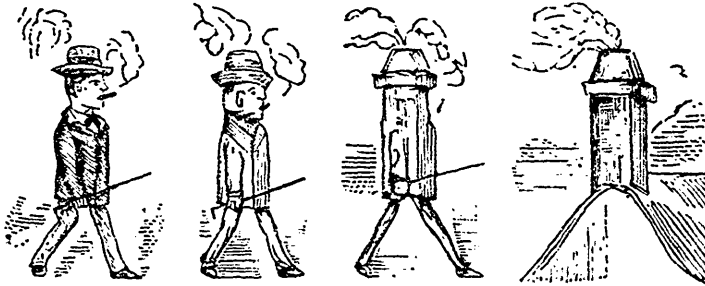
A WRITER in an exchange contends that as the two instincts, procreation and hunger, underlie the very existence of the human race, the origin of much of the evil which afflicts the human race must be looked for in the abuse of these two instincts. There is doubtless much truth in this.

CREOLINE, the new antiseptic, is a derivative of coal-tar. It is possessed of very marked bacillicide properties, a solution of 1:1,000 sterilizing cultures of the cholera bacillus. Its deodorizing properties are equally remarkable, a very small quantity of the above solution removing the offensive smell of putrefying liquids.

M. PASTEUR'S proposal to destroy the rabbits in New South Wales is not likely to meet with favour. The remote consequences are feared. As the British Medical Journal says: The mere fact that the microbe is capable of producing fatal disease in two animals so dissimilar as domestic poultry and rabbits ought to serve as a warning that it may possibly develop into a pestilence affecting other species of animals, and even man himself; for once the disease is introduced into the rabbit warrens, it has passed beyond human control.

ACCORDING to the N. Y. Medical Record, Governor Hill, in his annual message, recommends the abolition of the State Board of Health and the vesting of its powers in one responsible official, by which the efficiency, usefulness and economy of the public service will be increased. We fully agree with this and have repeatedly urged that organizations of this kind would be much better than boards, which are too often but irresponsible political machines.

A NEW YORK edition of this JOURNAL, under the name of the PROPHYLACTIC, is now issued simultaneously with the Ottawa edition. The head office of the PROPHYLACTIC is at Brentano's, Publishers, 5 Union Square.



CONDENSED FROM "GOOD HEALTH."

NOTES ON CURRENT LITERATURE.

INTESTINAL DISEASES OF CHILDHOOD, Physiology, Hygiene, Pathology and Therapeutics, by A. Jacobi, M.D., Pres. New York Academy of Medicine and Clinical Prof. of diseases of children in the N. Y. College of Physicians and Surgeons, is the last volume issued of the admirable series of "The Physician's Leisure Library," published by George S. Davis, of Detroit. It consists of 300 pages of very practical instructions on this class of diseases, and it seems a marvel to get such a well-arranged, reliable little treatise for 25c., or even less to subscribers. In his introductory chapter Jacobi writes: "The hygiene rules for infants concern the digestive organs mainly, so much so that infant hygiene and the hygiene of the digestive organs in infants appear to be nearly identical."

THE CENTURY for March contains, "Bismarck in his Garden," Frontispiece; "The Home Ranch," illustrated; "Lifted Veils;" continuation of

"The Graysons, A Story of Illinois;" "Salisbury Cathedral," illustrated; "Abraham Lincoln—The call to arms"; "An Eastern Legend"; the conclusion of "Au Large"; "Franklin's Home and Host in France"; Russian State prisoners"; and a highly interesting account of "Colonel Rose's Tunnel at Libbey Prison" and his escape; with much other interesting matter.

HON. HORACE DAVIS, lately elected to the presidency of the University of California, will have an article in the forthcoming (March) *Overland*, developing his theory in explanation of Shakspeare's sonnets. He finds in them the record of much of the inner life of the great poet, and convincingly defends his interpretation.

ST. NICHOLAS for March contains a Frontispiece, "Little Babie Stuart;" "An Ancient Haunt of Pirates," thirteen illustrations; "Tracks in the Snow," six illustrations; "The Hobart Treasure;" "The People we Meet," eight illustrations; "Pansies for thoughts;" "Tom's Bride;" "The Bronzed Kid Shoes," a poem; "Edward Athoy," eleven illustrations; "Child Sketches from George Elliot. III. Daniel Deronda;" "A Pig that Nearly Caused a War," with a map; "Drill, A Story of School-boy Life;" "Accidental High Art," six illustrations; "A Regular Boy" Verses head piece and six illustrations, very funny and "For very little folk" (illustrated); altogether a very good number.

BOOK CHAT for February, Brentano's publishers, 5 Union Square, New York, gives a long list of magazines and reviews with the principal articles classified under subject and indexed up to date on current magazines; also a list of the principal books published in February and what the book is about. Anyone who has waded through a vast field of periodical literature for the latest thought on any certain topic will appreciate the value of Book Chat.

THE GREAT AMHERST MYSTERY, is a forthcoming sensational book by Walter Hubbell, a "true narrative of a genuine haunted house," to be issued at an early day by Brentano's, 5 Union Square, New York. The author undertook to expose a supposed fraud but found, it appears, that there was no fraud about it.

THE "Annals of Surgery," the only English Journal published devoted exclusively to Surgery, enters now upon its 4th year. Drs. L. S. Pilcher, of Brooklyn, N. Y. and C. B. Keetley of London England are the chief editors, and are assisted by most of the able Surgeons of this country and Europe, which is a sufficient guarantee of its literary merits. We bespeak for it the co-operation of the members of the profession who are interested in progressive Surgery. J. H. Chambers & Co., St. Louis, Mo., are the publishers and deserve great credit for undertaking to produce such an important Journal as the "Annals" and for its high artistic execution.

VICKS "Floral Guide" for 1888 comes laden with a great deal of valuable information on flowers and plants of all sorts with colored illustrations as natural as life, to be obtained, we believe free, from James Vick, the great seedsman, Rochester, New York.