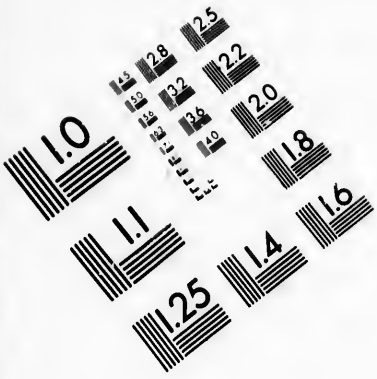


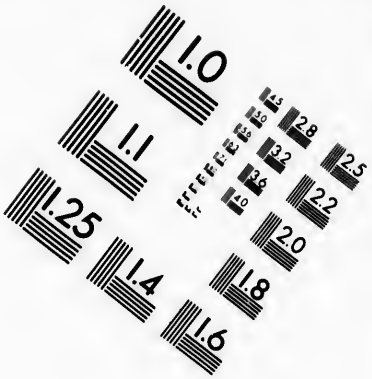
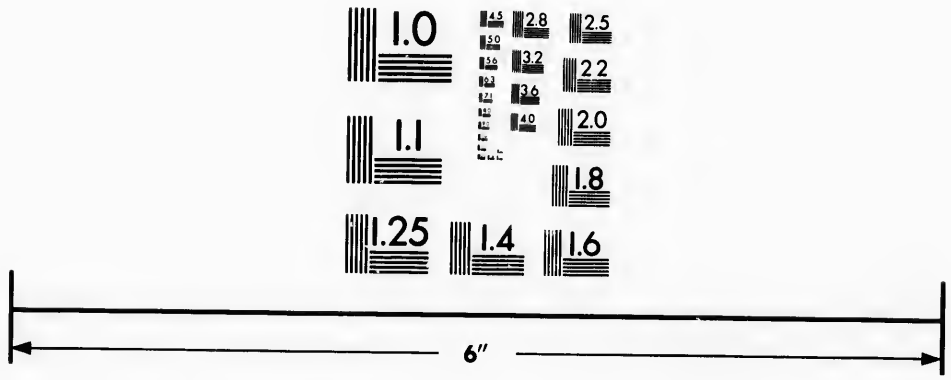
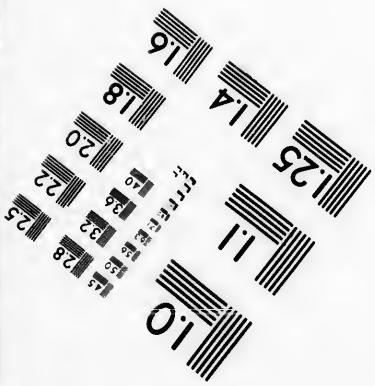
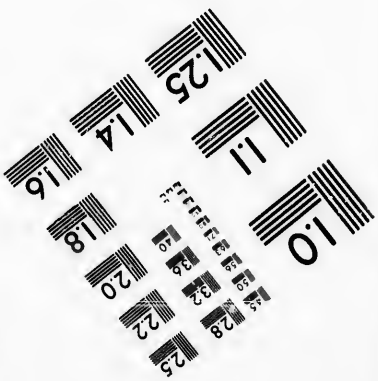


IMAGE EVALUATION
TEST TARGET (MT-3)







Photographic
Sciences
Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

CIHM Microfiche Series (Monographs)

ICMH Collection de microfiches (monographies)

Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques

Technical and Bibliographic Notes / Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- [ ] Coloured covers/ Couverture de couleur
- [ ] Covers damaged/ Couverture endommagée
- [ ] Covers restored and/or laminated/ Couverture restaurée et/ou pelliculée
- [ ] Cover title missing/ Le titre de couverture manque
- [ ] Coloured maps/ Cartes géographiques en couleur
- [ ] Coloured ink (i.e. other than blue or black)/ Encre de couleur (i.e. autre que bleue ou noire)
- [ ] Coloured plates and/or illustrations/ Planches et/ou illustrations en couleur
- [ ] Bound with other material/ Relié avec d'autres documents
- [ ] Tight binding may cause shadows or distortion along interior margin/ La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- [ ] Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/ Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.

- [ ] Coloured pages/ Pages de couleur
- [ ] Pages damaged/ Pages endommagées
- [ ] Pages restored and/or laminated/ Pages restaurées et/ou pelliculées
- [x] Pages discoloured, stained or foxed/ Pages décolorées, tachetées ou piquées
- [x] Pages detached/ Pages détachées
- [ ] Showthrough/ Transparence
- [x] Quality of print varies/ Qualité inégale de l'impression
- [ ] Continuous pagination/ Pagination continue
- [ ] Includes index(es)/ Comprend un (des) index

Title on header taken from:/ Le titre de l'en-tête provient:

- [ ] Title page of issue/ Page de titre de la livraison
- [ ] Caption of issue/ Titre de départ de la livraison
- [ ] Masthead/ Générique (périodiques) de la livraison

- [x] Additional comments:/ Commentaires supplémentaires: There are some creases in the middle of pages.

This item is filmed at the reduction ratio checked below/
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	12X	14X	16X	18X	20X	22X	24X	26X	28X	30X	32X

The copy filmed here has been reproduced thanks to the generosity of:

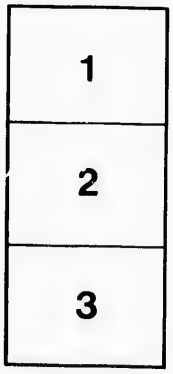
National Library of Canada

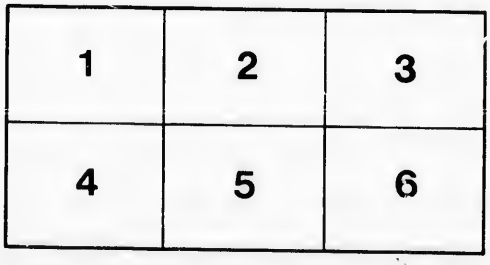
The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol → (meaning "CONTINUED"), or the symbol ▽ (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:





L'exemplaire filmé fut reproduit grâce à la générosité de:

Bibliothèque nationale du Canada

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole → signifie "A SUIVRE", le symbole ▽ signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

32x

MANUAL OF HYGIENE

BOARD OF HEALTH

OF THE

PROVINCE of QUEBEC

CHAIRMAN:

EMMANUEL PERSILLIER LACHAPELLE, M. D., Montreal.

MEMBERS:

HENRY R. GRAY, Esq., Montreal.
C. E. LEMIEUX, M. D., Quebec.
J. B. GARNEAU, M. D., Ste-Anne de la Pérade.
HON. A. H. PAQUET, M. D., St. Cuthbert.
ROBERT CRAIK, M. D., Montreal.
ROMUALD FISET, M. D., Rimouski.
ELZÉAR PELLETIER, M. D., Secretary, Montreal.

HEALTH INSPECTOR:

J. A. BEAUDRY, M. D., Montreal.

MANUAL OF HYGIENE

FOR THE USE OF

SCHOOL AND FAMILIES

BASED ON THE

INSTRUCTIONS OF THE BOARD OF HEALTH

OF THE

PROVINCE OF QUEBEC

WITH ILLUSTRATIONS

BY

SEVERIN LACHAPELLE, M. D.

Professor of Hygiene, Laval University; Physician to the Children's Dispensary, Notre-Dame Hospital; Author of a work entitled "La santé pour tous"

TRANSLATED BY

M. T. BRENNAN, M. D.

Late Professor Jacques-Cartier Normal School and Reformatory School; Lecturer on Histology and Pathology, Laval University; Surgeon Notre-Dame Hospital; Surgeon, Dispensary Sisters of Mercy, &c,

---

MONTREAL
DESAULNIERS & LEBLANC, EDITORS AND PRINTERS

1891

PREFACE.

The predominant feeling of every individual, is that of self-preservation. To maintain health when good, to improve it when impaired, to shun the causes of disease and to lengthen life, have always been the supreme desires of mankind in all ages and are still the solicitous study of the present generation.

Success has, in a measure, crowned the efforts in this direction. The average of man's life has increased ; diseases are less deadly ; and the formerly wide-spread epidemics, more easily controled and eradicated. Vaccination, for instance, has reduced the rate of mortality in small-pox from 25% to 1%.

The Province of Quebec, fully understanding that their first national duty is the care of the life and health of the inhabitants, established the Provincial Board of Health, a truly useful and efficient institution.

The first effectual measure taken by this Board was to insure a widespread knowledge of the fundamental laws of health.

To the initiative of the Board is due the produc-

tion of this work. Its publication, we well understood to be no small task : thanks, however, to the ready assistance of the Board, we believe all difficulties have been overcome.

One serious obstacle was to be surmounted : the dryness of technicals and the unintelligibleness of scientific demonstrations ; we have tried to preserve simplicity in writing, clearness and brevity in stating facts.

The introducing of the science of hygiene into our schools should certainly not overload the course of studies ; on the contrary, it should be an agreeable and useful diversion from the routine of general teaching.

To those who might entertain certain doubts as to the utility of such a work as this, the author would point out that beneath the study of sanitary science lies this other momentous question : the moral and physical improvement and increase of Canadian nationality.

The countless victims of a premature death might often trace the cause of their untimely demise to the violation of some of the rules of health. Men with a due respect for those rules might reach a limit of life far beyond the actual average—a limit that would but increase with the future generations.

We cannot expect to attain the extreme limits of age, otherwise, than by an attentive study in youth, and the strict observance thereafter, of the laws that govern health ; we must know how to eat, how to drink and how to breathe ; we must acquire a knowledge of the agents that contaminate air and food ; in a word, we must be able to regulate the

mode of living of the body and insure a wise and careful training for the intellectual faculties.

(In the translation of this manual, the author's text has been carefully followed; this strict adherence to the original, with a knowledge of the destination of the work have added greatly to the difficulties of producing a translation free from blemishes: the volume being intended to popularize sanitary knowledge, it was thought better in it to appeal to clearness and conciseness of expression rather than to elegance.)

Notes by the translator are placed within brackets.

BREATHING

FIRST LESSON

THE AIR

1. Composition of the Air.—Air is a compound consisting of two gases: nitrogen and oxygen. For a volume of 100 parts of air, there are 79 parts of nitrogen and 21 of oxygen.

The body of air which envelops the terrestrial globe is called the "atmosphere." Besides nitrogen and oxygen, this body of air contains a certain quantity of watery vapor whose weight varies according to seasons, climates and temperature. It contains also a small proportion of carbonic acid, or carbon dioxide, a gas very injurious to breathing although the product of respiration.

2. Vitiated Air.—The air becomes unwholesome from different causes, but more especially when the proportion of carbonic acid is in excess.

Any atmosphere containing more than seven tenths per 1000 of carbonic acid becomes unwholesome.

Carbonic acid in excess is found most frequently in rooms where the air is not renewed often enough.

1. Give the composition of the air? Does the air contain only oxygen and nitrogen?

2. When does the air become unwholesome? What proportion of carbonic acid is injurious? Where is carbonic acid found in excess in the air?

An excess of carbon dioxide, vitiating the air, is recognized by the following method: To a 10½ ounce bottle full of air, is added 1 ounce of clear lime-water; if there be no excess of carbon dioxide, the water will remain clear; if a white precipitate form at the bottom of the bottle, there is an excess of the gas.

The penetrating and fusty odor of closed rooms is caused by certain organic substances exhaled from the body by the lungs and the skin.

3. BREATHING.—Breathing is a function by which the dark blood from the veins comes into contact with the air in the lungs and is changed into the red blood found in the arteries (fig. 20).

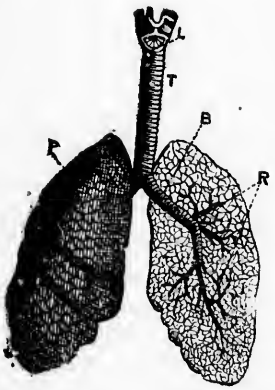


Fig. 1.
P Lung.—R Lung cells and branching of the bronchial tubes.

The breathing apparatus is composed of the windpipe *t*, of the bronchial tubes *b*, and of the lungs *p*. The windpipe is the continuation of the larynx, which is the first section of the air-tube. It ends in two branches called bronchi, the latter being themselves subdivided into an infinite number of cells *r*, which constitute the lungs.

How can an excess of carbon dioxide be demonstrated?

What causes foul odor in closed rooms?

3. What is breathing? Describe the structure of the breathing apparatus.

Breathing is effectuated by two movements: the first, called *inhaling*, or inspiration, by which the air enters the lungs; the second, called *exhaling*, or expiration, by which the air is forced out of the lungs.

Man breathes, on an average, eighteen times per minute.

At each inspiration, the lungs absorb about a pint of air.

4. IMPORTANCE OF BREATHING.—The importance of this function can be shewn as follows:

Breathing, as already said, changes the dark blood into red blood; this transformation is brought about in the following manner; during the *inhaling* process, oxygen, which is the vivifying portion of the air, penetrates into the blood where it meets carbon and hydrogen, two bodies with which it combines to form carbonic acid and water which are eliminated from the lungs by the process of *expiration*.

Carbonic acid is essentially an injurious gas and is to be found in quantities 120 times greater in the air *exhaled* than in that *inhaled*.

5. HOW TO PURIFY THE AIR.—One must, as far as it is possible, furnish the lungs, for a given period, with 120 times the volume of air to be inhaled;

How many movements are there in breathing?—What is the amount of air inhaled at each inspiration?

4, Of what importance is breathing?—Is the amount of carbonic acid the same in the air exhaled as in that inhaled?

5. What quantity of air is required to purify that vitiated by breathing?

for instance, if a person inhale 16 or 17 cubic feet of air within an hour, the apartment occupied must contain 120 times the above quantity of pure air, in order that the person be not poisoned by the exhalations from his own lungs. In other words, 2000 cubic feet of air per hour must be supplied for breathing; but, as other noxious matters emanate from the lungs during the expiratory act, the necessary supply of pure air should be about 3000 cubic feet for each person.

The carbonic acid in the atmosphere is partly absorbed by plants and trees, which, during the day-time, supply the oxygen we need.

On the contrary, during the night-time, flowers give off carbonic acid; hence, the danger of keeping them in a bed-room during the night.

Two facts are drawn from the preceding lesson: 1. The lungs act upon air like the stomach upon food: they digest it and effect its union with the blood.—2o. To preserve health, the lungs must be supplied with pure air. Hence, the necessity of the thorough ventilation of houses.

What becomes of the carbonic acid?—Why not keep flowers in a bedroom during the night-time?—What is the advantage derived from the study of breathing?

SUMMARY.

The constituent elements of pure air must be in fixed proportions.

The air becomes unwholesome when the quantity of carbonic acid is in excess.

Breathing is effected by the lungs, and changes the dark blood from the veins into red blood for the arteries.

To purify the polluted air in the house, a fixed quantity of pure air from outside must be allowed in.

During the day-time, plants and trees absorb carbonic acid and supply the necessary oxygen for the support of life.

The study of the air and of respiration shows the extreme importance of ventilation.

SECOND LESSON

HYGIENIC RULES OF RESPIRATION

6. VENTILATION.—Pure air is life, unwholesome air, poison and death.

Example: After Napoleon's great victory over the Austrian army, at Austerlitz, 300 Austrian prisoners were locked up in a cellar; out of that number, 260 died from asphyxia in a very short time.

Ventilation is quite easy during the mild season; people then live more in the open air, and the doors and windows are almost constantly left open. But, during the cold season, sensible ventilation is seldom practised.

7. VENTILATORS. — Ventilation is effected by mean of the ventilator.

The opening made in a double-window, and the stove-door, or the chimney-hole or flue constitute the ordinary system in use; by the first, pure air is admitted into the house, by the latter, vitiated air is expelled.

However, a special apparatus called "a ventilator" is made use of for the purpose of purifying and renewing the air.

In houses, the apertures of windows are often

6. Give an instance to prove that unwholesome air is dangerous to life?

7. How is ventilation effected?—What is a ventilator?

Why should the ventilator in a window be in the upper part?

wrongly disposed or are too small ; the best opening is that made the full size of a pane of glass, the pane chosen to be preferably in the upper part of the window ; otherwise, the air of the outside being denser than that of the inside will forcibly fall to the lower part of the room ; coming

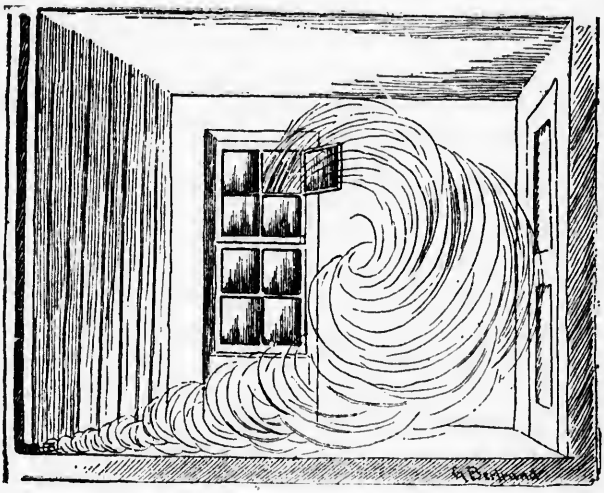


Fig. 2.

Fresh air entering by the upper aperture spreads itself out into the room and forces the vitiated air out through a lower aperture connected with a special chimney.

from above, the air is less felt, and its weight favors a more rapid expulsion of the inside air which has become unwholesome.

In order to obtain a complete expulsion of the

Is a chimney sufficient to effectuate the withdrawal of the unwholesome air of a room ?

vitiated inside air, there should exist in each room of a house, a pipe with an entrance at the lowest part of the wall within the apartment and said pipe should be in communication with a heated flue, or some special chimney.

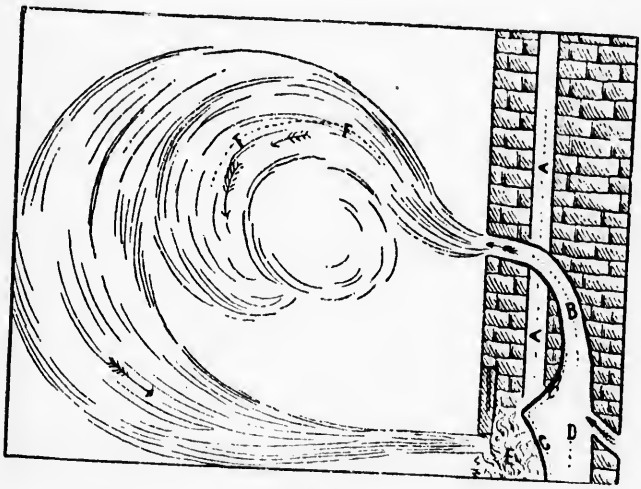


Fig. 3.

A system of ventilation by a chimney. The fresh air enters by the aperture near D, is then heated in the reservoir C D, passes up through the pipe B, enters the room and finally escapes by the chimney.

Epidemics appearing during the cold season may perhaps be traced to bad ventilation. Dwellings, being kept hermetically closed during the winter, afford a proper field for the development of the germs of disease.

Why are some diseases more frequent during winter time?

The frequent renewal of the air in houses is of absolute necessity on account of the generally limited size of the rooms. Impure air is to be found in greater proportions in the upper parts of rooms than in the lower parts. Low ceilings are essentially at variance with the laws of health.

8. THE BED-ROOM. — The bed-room, above all, calls for particular attention, because in it is spent a full third of the twenty-four hours of the day. It must be spacious and contain a supply of air sufficient for comfort during sleep; eight hours as an average.

It has been calculated that, for one person, the bed-room should be 10 feet square, if ventilation is suppressed for want of openings. If the room can be ventilated during the night, it may be of a smaller size; ventilation should then be practised with great care, not allowing ingress to too much cold air at a time.

One must not forget that air breathed twice is perhaps one of the principal causes of lung diseases which carry off so many victims from our midst; such air also generates typhus fever in the same manner that water develops typhoid fever.

The importance of pure air is shown in the clearest manner by the stay of city invalids in the country. Sometimes only a few days are sufficient to reinfuse a vigor apparently extinct; it is because

Are the dimensions of the rooms in our houses sufficient?

8.—What should be the size of a bed-room?

What particular diseases may be developed by breathing the same air several times?—Where is pure and invigorating air to be found?

in the country, along the shores of our lakes and rivers more particularly, people breathe an excellent air loaded with pure oxygen and free from all noxious carbon compounds. In such air there is found a substance, even superior to oxygen, called *ozone*, which destroys all the organic matters contained in the atmosphere; thus preserving only what is useful for the maintenance of life.

We well understand the difficulties of procuring proper ventilation in our climate without lowering the temperature; but such difficulties can be overcome, and all the efforts of architects and sanitarians should tend towards this object.

9. WATER-CLOSETS. SINKS. BATHS.—The water-closet should be supplied with a special vent-pipe to facilitate the exit of foul air. The outflow pipe should also be supplied with a ventilating shaft so as to prevent the air of the street sewers from entering the house as so often happens when this precaution is neglected.

Those pipes must reach to a point above the roof of the house, through a special chimney. The ventilation of the sinks and baths should be secured in the same manner. It being known that warm air is lighter and more rarefied than cold, and that the temperature of the waste-pipe is lower than that of the bath-room, the following inference results: that the foul air of the waste-pipes tends naturally to be drawn up into our houses, which thus become

9.—How should the ventilation of water-closets, sinks, and baths be made?

How do you explain the necessity of the airing of an outflow pipe?

the real ventilators, especially during winter-time, not only of the out-flow pipe, but even of the street sewer; hence, the importance of a ventilating shaft for the waste-pipe so that the dangerous miasms from it be prevented from penetrating into the house.

The vent-shaft of the out-flow pipe is not sufficient to keep the foul air from entering; a cut-off, or an S, or water-seal, is required; this is a bend in the pipe, which, when filled with water, prevents the air from passing up.

There should be two water-seals; one near the bath, the sink and water-closets; the other near the main waste-pipe, that is at the junction of the drains with the street sewer.

10. ASPHYXIA.—Asphyxy or suffocation, occurs when respiration is stopped. It happens in several ways. The following are the principal ones with the means of bringing a suffocated person back to life.

11. SUFFOCATION BY GAS, COAL, &C.—If, on entering a closed room with a light, it suddenly goes out, be careful! for there is a lack of oxygen in the room.

Such an atmosphere is not fit for respiration; therefore, it must be renewed before one enters the apartment.

Is the ventilation of the drain pipe sufficient to protect the houses against the entrance of the unhealthy air of the drains?

How do you explain the necessity of the ventilation of drain-pipes?

Is one water-seal sufficient?

10. How and when does suffocation occur?

11. Will a candle remain lighted where there is insufficient oxygen?

Is such an atmosphere suitable for breathing?

Suffocation by gas happens when the amount of oxygen penetrating the lungs is not sufficient to change the dark blood into red blood (see parag. 3).

To restore a suffocated person, the following means should be used: Loosen all clothing, give at once pure, fresh air, wash the face with cold water, and, then, if this does not suffice, have recourse to artificial respiration practised in the following manner:

Fig. 4.

The patient is laid upon his back; the operator kneeling above the person's head. Both arms are grasped near the elbows and stretched out horizontally away from the body; then elevated above the head till they meet each other, being drawn suddenly and forcibly for a few seconds. Those manoeuvres promptly fill the lungs with air by elevating the ribs and expanding the chest.

The second part of the operation consists in

How is asphyxia from carbon dioxide produced?

11-12-13. What manoeuvres should be used to resuscitate a person asphyxiated by gas, cold or water?

replacing the arms in their former position alongside the chest, exerting strong pressure on the lower ribs so as to force the air out of the lungs, and produce expiration. This reverse motion should not occupy more than an instant.

Fig. 5.

Those up and down movements should be repeated about sixteen times a minute for a certain time. We should never suspend artificial respiration before ascertaining with certainty that the heart has ceased to beat, and, therefore, that life is extinct.

(In all those movements, it is essential that the air have free ingress to the lungs; all obstacles should be removed from the air-passages; a gag (cork or knotted handkerchief), put between the teeth; the tongue depressed or pulled out; the lower jaw pushed to the front by pressure from the angles, thus stretching the windpipe and bringing the tongue forward).

Should the above means fail, we should never, neglect to force air into the lungs through a tube, or in default of this, from mouth to mouth. We should not despair too quickly: cases are on record of veritable resuscitations after several hours of asphyxia from gas, cold, or drowning.

12. ASPHYXIA FROM COLD.—We inhabit a country where cold benumbs and often kills; we should, consequently, never forget the treatment of suspended animation from cold.

In such cases, the greatest precautions are required to revive the patient; by acting too hastily, death may result; such an accident may occur, if the warmth is brought back too precipitately. The benumbed person should be first rubbed persistently with snow, to recall the heat gradually, and he should not be removed to a warm place till he has given signs of returning animation, and the body has lost its rigidity. Then, there should be no fear of administering stimulating drinks and of rubbing the body vigorously; at the same time, too great a heat should be avoided by leaving the windows open, if in a house, and by remaining aloof from the fire.

The warmth should return naturally and not from the use of too hot applications.

13. ASPHYXIA FROM DROWNING.—As soon as a submerged person has been withdrawn from the water, he should be turned over on his face to disencumber the air-passages from froth, or other obstructions that might prevent the free ingress of the air; vomiting should not be provoked, as it is the organs of respiration that need succor; so, the habit of violently rolling the body of a drowned

person of hanging it by the heels and similar barbarous practices, should be persistently discouraged.

Artificial respiration, such as taught for asphyxia from gases, should be employed.

(A very simple and effective method is that of Harvey and it may be conveniently employed in a boat. "The submerged person is drawn into the vessel at the bow or stern to avoid capsizing the craft, and placed up on his back, his shoulders on a thwart, his neck unsupported and the back of the head resting on, or near, the bottom of the boat, the arms extended alongside the head; the throat, chest and waist should be freed from any pressure by the clothing. No other manœuvre is often necessary to free the air-passages from water, froth, &c., and re-establish respiration. When the head of the subject is allowed to hang lower than the shoulders, the air seems to pass into the chest more readily than when the head rests on a level with the body.")

If the air seems to go in and come out of the nostrils, the efforts should be continued till life is completely restored. If, on the contrary, those means do not seem to succeed, mouth to mouth breathing should be at once tried, giving time for the air to return after each insufflation: when breathing into the mouth, the patient's nostrils should be tightly pinced to insure the penetration of the air into the pulmonary cells and prevent its issuing forth through the nasal passages.

At the same time, energetic frictions with anything suitable that comes to hand, should be employed to revive the sluggish circulation. Should the person have been submerged, however, a certain time, in ice-cold water, the heat should be cautiously and gradually reinfused.

The faithful applications of those details, which may be the means of saving life, should always be made. Their knowledge should be indelible, because experience shows us how the excitement which always prevails at accidents, obliterates the most elementary ideas of prudence and care.

14. ACCIDENTS TO THE RESPIRATORY APPARATUS. —As is known, the opening of the larynx placed in front of the œsophagus, (which carries the food in the stomach) (fig. 6), closes when anything is swallowed; but, care must be taken not to breathe —as when laughing or speaking—during the act of deglutition, otherwise, the substance that was about to be swallowed may fall into the larynx and cause suffocation.

Is it important to be perfectly familiar with all the hygienic principles just explained?

14. What are the accidents that may occur in the respiratory apparatus?

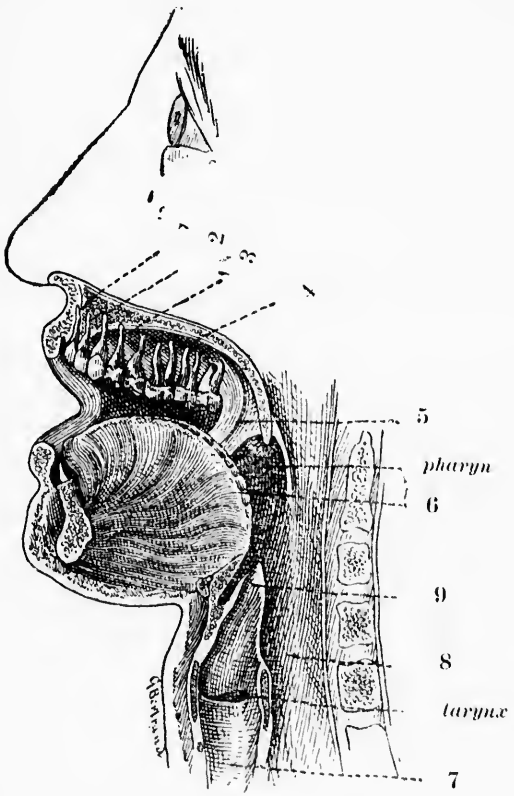


Fig. 6.

Only one half of the upper jaw is shown here.

1. Two incisors.
2. A canine.
3. Two small molars.
4. Three large molars.
5. The tonsil.
6. The tongue.
7. The windpipe.
8. The œsophagus.

9, The epiglottis which closes the larynx when we swallow.

In such emergencies, which often occur in children, the nostrils should be pinced so as to close them completely : this has the effect of producing violent expiratory efforts by which the foreign body may be forcibly expelled.

The waist may be too tight and cause inconvenience by interfering with the downward movement of the breathing; when a case of asphyxia occurs from any cause, we should hasten to undo the clothing and loosen the waistbands.

15. DISEASES OF THE RESPIRATORY SYSTEM.— The most common of those diseases is a cold; colds are sometimes not serious, but they may often be the starting point of a rapidly developing ailment; therefore, they should never be neglected.

The habit of breathing through the mouth readily exposes to diseases of the throat and chest. It is preferable to accustom children, while young, to breathe through the nose, the air being warmer and moister; this precaution is especially called for when the air is cold and dry.

If we breathe through the mouth, being careful to keep the tongue pressed against the palate, the air, not penetrating so directly into the throat, will be warmed as in nasal respiration.

What is to be done in a case of asphyxia from a foreign body lodged in the larynx?—Is a belt, or a tight waistband, productive of evil in cases of asphyxia?

15. What is the most common disease of the breathing apparatus?—How should one breathe?

SYNOPSIS.

The change of air in apartments is obtained by means of ventilators.

Fresh air is introduced, and that vitiated by breathing, combustion, etc., is expelled.

The most usual ventilation is that obtained by an opening in a window, or through a chimney-flue.

Inadequate ventilation, especially in winter, favors the development of several diseases.

The bed-room should be of sufficient size to ensure the purity of the air.

Air vitiated by respiration and breathed again is very deleterious to health.

The water-closets, sinks, and baths require special ventilation.

Asphyxia may be caused by gas, cold or water.

Asphyxia from gas occurs when there is not sufficient oxygen in the air breathed to transform the dark blood into the red blood.

Haste must be made to renew the air in suffocation by gas.

In asphyxia from cold, the warmth should not be brought back too suddenly.

In asphyxia from drowning, it is more important to assist respiration than to empty the stomach of the water it contains.

In cases of asphyxia, recourse must often be had to artificial respiration.

Several accidents may occur in the respiratory apparatus.

The diseases of the respiratory organs commonly called colds, should never be neglected; the physician should be consulted without delay.

Children should be taught, from their early years, to breathe through the nose; the air is better heated by passing through the double passage of the nostrils than by the mouth, and is also moister and better for breathing purposes.

THIRD LESSON

INFECTIOUS DISEASES

16. DEFINITION AND PROPAGATION.—Infectious diseases are those that may be contracted from a sick person by a person in good health.

Infectious diseases are caused by germs called microbes. These microbes are beings of an infinitely small size that live and multiply when placed in favorable conditions; such as, for instance, heat and dampness. Microbes move easily from one place to another. (Leuvrenhoek)

Infectious diseases are propagated in many ways: thus, the spreading may be caused by direct contact, through the medium of the air, water, milk, food, garments, and all articles that are used by mankind.

The dreadful epidemic of small-pox, in 1885-86, was originated in Montreal by an infected person coming from the United States.

An ignorant servant may introduce an infectious disease into one's family; it is, therefore, a duty for housekeepers to watch over their employees' associations.

The principal infectious diseases are typhoid fever, small-pox, measles, scarlet fever, diphtheria; the latter's chief manifestations being croup and exsudative quinsy.

16.—What is meant by infectious diseases?—How can we explain the mode of production of infectious diseases?—How is the spreading of these diseases produced?—Give a few examples?—What are the principal infectious diseases and those most frequent among our population?

Providence has not chosen that all constitutions be equally subject to the action of the germs of infectious diseases.

Every individual has not what is known as the same morbid receptivity; it is through the ignorance of this important point that so many persons do not believe in contagion.

There are circumstances that specially prepare the body for contagion; thus, when one is fasting, absorption is more active, and it is then very dangerous to enter the room of a sick person; convalescents should avoid sleeping in such rooms, because, as their strength is diminished, the danger is serious for them; a convalescent should, for the same reason, avoid every centre of contagion.

The germs of infectious diseases have in warm and damp places a good pabulum for development; it is in dirty and insufficiently ventilated houses that those favorable conditions are specially met with. Sanitary charts in every country all show that the spreading of infectious diseases always originates in the most unhealthy parts of a locality.

The avoidance of caution, in the presence of such dreadful scourges, is criminal; our chief duty, then, is not to expose ourselves to the contact of patients; the next, is to ensure the execution of the municipal and provincial by-laws, which are the only safeguards of society.

Are all persons equally subject to take the infectious diseases? — Are there any circumstances that specially prepare the body for contagion? — What is the most favorable centre for the spreading of infectious diseases? — Is it in the power of man to combat infectious diseases?

17. PREVENTIVE MEANS AGAINST INFECTIOUS DISEASES.—Infectious diseases affecting a large number of persons at the same time are called epidemics; those, that, although being of a same nature, are confined to a more limited territory, are said to be endemic; and finally, isolated cases are called sporadical.

Ventilation which is sufficient to purify the atmosphere of our rooms overburdened with poisonous gases and organic substances, all the products of respiration, has not the same influence upon the germs of infectious diseases; air and light alone are ineffectual.

Infectious emanations must be destroyed on the spot, in the ways here below indicated; because it belongs to the nature of the germs to linger in the places where they are developed: an analysis of the air will show that they exist near the sick person in larger quantity than in any other part of the room.

It is therefore necessary, when in a sick person's room, to keep away from the bed as much as possible, apart from the time prescribed for the administration of remedies or any other care.

In olden times, epidemics were regarded as mysterious, and they were the terror of populations; their nature is now completely known and mankind has at his disposal such means as will stop the progress of these scourges and their ravages among us.

Preventive hygiene for infectious diseases consists

17. What must we understand by epidemic, endemic, and sporadical diseases?—Is ventilation sufficient to destroy the germs of contagion?—What must be done against infectious emanations?—Is there more danger of contagion near the patient's bed?—How are epidemics to be regarded?—What are the principal points of preservation against infectious diseases?

in three important points, around which all other details group themselves: official information, isolation and desinfection.

There is a fourth point which we will mention separately, as it applies to one disease alone: it is *vaccination, the only preventive against small-pox.*

18. OFFICIAL INFORMATION. — Society implores protection: in divine law as by human right, society must rank before the family.

As soon as an infectious disease has made its appearance, it is a duty for the head of the family, as well as for the attending physician, to make the fact known as quick as possible to the municipal authorities. The law is very plain on this point.

When informed, the authorities should proceed to immediately investigate the sanitary condition of the house where the sick person lies, the probable mode of spreading of the disease, the ventilation of the school attended, if the patient be a child, and, in conclusion, suggestions should be given and promptly executed.

19. ISOLATION.—Isolation should be effected without any opposition from the family, which, aware of all the dangers of contagion, should regard it as a duty not to expose their neighbors to the disease and perhaps to death.

A placard, *in view and well posted up,* should warn everybody of the threatening danger from the existence of an infectious disease in the house.

The isolation should be absolute, consisting in the

18. Is official information necessary?—What shall the authorities have to do, when informed?

19. How should isolation be practised?

Is a placard necessary?—Should the isolation be absolute?

isolation of the house in the locality and that of the patient in the house.

The patient should be isolated in a room which, as far as possible, should be selected in the upper part of the house.

A person suffering from an infectious disease should not be allowed to stay in a house where no room can be found for isolation, and should be removed as quick as possible to the hospital.

The patient should be isolated, not only from the other members of the family, but, also from all the effects he used to have around him; his room should contain only indispensable articles of furniture: no carpet, no table, no chairs; only the bed without any ornaments.

A cotton sheet soaked in a disinfecting solution should be hung outside, over the door of the room.

20. DISINFECTION. — Disinfectants are those substances which, through a physical or chemical action, neutralize or destroy the organic principles which constitute the germs of infectious diseases.

Disinfectants, which kill the germs of diseases, should not be mistaken for antiseptics, which prevent decomposition—such as, for instance, salt and alcohol, which preserve meat—nor for deodorizers, which destroy foul odors.

Disinfectants kill the germs of diseases, which,

Where should the patient's room be located?—What will have to be done when no suitable room is to be found?—Should the patient be isolated from the other members of the family only?—What should be put over the door of the patient's room?

20.—What is meant by disinfectants?—Do disinfectants act in the same manner as antiseptics and deodorizers?—What is the action of disinfectants?

as it has already been said, are known to be microbes.

(It is highly important for public security that these agents called *deodorizers* be in no way confounded with *true disinfectants*; many substances and apparatus said to have disinfectant properties, are, in reality, simply deodorizers, which, by masking certain odors, give a false security, and are often the means of doing great harm by preventing the use of more energetic agents).

The germs, or infectious agents, are called *contagia*.

It should be borne in mind that air and light, which are sufficient to renew and purify the supply of air in dwellings, are impotent to destroy the infectious germs that may be contained in the atmosphere; it is necessary to attack and destroy these contagia when they have got into our houses.

Heat, and also some substances that we shall mention hereafter, have alone the power of destroying the germs of infectious diseases.

21. DISINFECTION DURING THE DISEASE.— The patient has been isolated. The nurse should wear a linen or cotton suit which can be easily washed in boiling water. Her clothes, and also the patient's, should be carefully disinfected: in this case, the disinfectant which should be used is the solution No. 4, which will be found further on. (See supplement at the end of the fourth lesson).

It is important for the public not to confound these agents called *deodorizers* with true *disinfectants*?

What is the name given to the germs of infectious diseases?—How can the disease-germs be destroyed?

21.—How can the clothes, articles used by the patient, and the excreta, be disinfected during the disease?

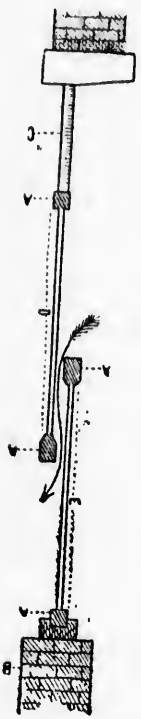


Fig. 7.

Pieces of cotton may be used by the patient as handkerchiefs, and they should be burnt when done with.

The food which the patient has refused to eat should also be burnt. All articles, such as spoons, knives, cups, etc., should be immediately disinfected in the solution No. 2. (See supplement at the end of the fourth lesson.)

The bed-pan should constantly contain a certain quantity of the solution No. 3, which should be increased after the patient's evacuations. (See supplement at the end of the fourth lesson.)

In the eruptive diseases, such as small-pox, measles, scarlet fever, the patient's body should be rubbed every day with camphorated oil; this oil will prevent the rapid evaporation of the exhalations without impeding the necessary perspiration.

The atmosphere of the room cannot be efficiently purified, on account of the impossibility of introducing a large volume of air at once; it will be necessary, however, to renew the air, as much as possible, by an imperceptable ventilation, which can be obtained by raising the lower part of the window

In the eruptive diseases, what precautions are to taken?—How is the patient's room to be ventilated?

about six inches, and tightly inserting a piece of board ; the air will thus circulate from the exterior to the interior. (Figs. 7 and 8).

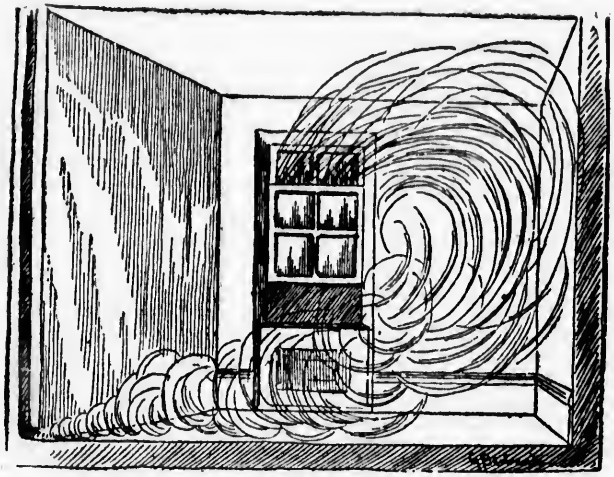


Fig. 8.

22. DISINFECTION AFTER THE DISEASE.—We know how to desinfect the clothes that can be washed, for the germs cannot resist a bath of half an hour in boiling water.

The clothes, garments, &c., which have not been frequently submitted to the preceding disinfection should be acted upon by vapours of sulphur. To disinfect with sulphur, hermetically close the room which contains all the articles to be disinfected, taking great care not to leave any opening through

22. After the disease, how must the patient's room be disinfected?

which the air may penetrate. The sulphur should be put into an iron saucepan which is placed upon bricks over a pail or a tub containing some water: the sulphur should be ignited with burning charcoal or alcohol. The operation will require three pounds of sulphur to every ten feet square, and should last twenty-four hours.

The vapours of sulphur are considered as the best, if not the only practical method of disinfecting a dwelling, as the germs cannot live in the sulphurous acid vapor.

Although the need of disinfection of the other rooms in the house is not so urgent, it should, nevertheless, be done, as the infectious germs may have been carried to all parts of the house by the persons in attendance upon the patient.

All the out-buildings and accessories of the house should likewise be disinfected: cellars, yards, stables, water-closets, cess-pools, sewers, should be cleansed with the solution No 1 or No 2. (See supplement at the end of the fourth lesson).

The patient, after recovery, should not meet the other members of the family before receiving a hot bath, given to him with the utmost care; his body should be cleansed with carbolic acid soap.

In the eruptive diseases, it will be necessary to wait till the skin has regained its normal condition; that is, till it is completely free from desquamation, or the dry parts which appear on it at the end of the disease, and which are dangerous vehicles of contagion.

How should the disinfection of the out-houses, etc., of the house be made?—When should the patient mingle with the other members of the family?

In case of death, the corpse should immediately be wrapped in a sheet wet with the solution No. 1 or No. 5 (See supplement at the end of the fourth lesson), and placed in a metallic coffin or one lined with metal: the metallic coffin is strictly required when the corpse has to be transported to a distance.

In no case, should any one be allowed to attend the funeral, which should take place within twenty-four hours.

RECAPITULATION.

Infectious diseases are always spread by means of their germs.

This spreading does not always occur in the same way.

There are some circumstances which specially favor contagion.

Heat and dampness are the most favorable conditions for contagion.

The strict observance of the official by-laws is one of the strongest means of combatting infectious diseases.

Official information, which so often meets with opposition, is always strictly needed.

The most absolute isolation should be obtained.

Disinfection should be made during and after the disease, according to given directions; these instructions ought to be followed as strictly as possible.

(Never use a deodorizer when a disinfectant is required.)

How should the disinfection of a corpse be made?—Is it permitted to attend the funeral of a person who has died from an infectious disease?

FOURTH LESSON.

CHIEF INFECTIOUS DISEASES.

23. TYPHOID FEVER.—All infectious diseases in this country are derived from foreign climates; there is no such disease that can be attributed to our climate alone. However, there are persistant causes for the maintenance and spreading of those ailments among our population; they will naturally disappear if their causes do; we must, however, make an exception for typhoid fever: this disease may be found in every country, and exists specially where the water is bad.

The morbid germs of typhoid fever are not all spread in the same way; typhoid fever transmits its germs through the water, as small-pox and diphtheria specially do through the air. The water infected by an unhealthy vicinity will develop typhoid fever. Therefore, the well of a house should be at some distance from the sewers, or from the centers of infection, fecal matter being mostly always the starting point of contagion. (Buck, Parkes).

Typhoid fever, which seldom prevails among children, becomes more frequent among adults and old people. However, the milk to which polluted water has been added may introduce this disease among children.

Are there any infectious diseases specially inherent to the climate of this country?—How do you explain the propagating of the germs of typhoid fever?—Is typhoid fever frequent at every age?

The astonishing cases of malignant typhoid fever which are found in the country all originate from the poisoning of the water by the products of some animal or vegetable decomposition going on near by, which, filtering through a porous ground, contaminate the water and render it unfit for consumption.

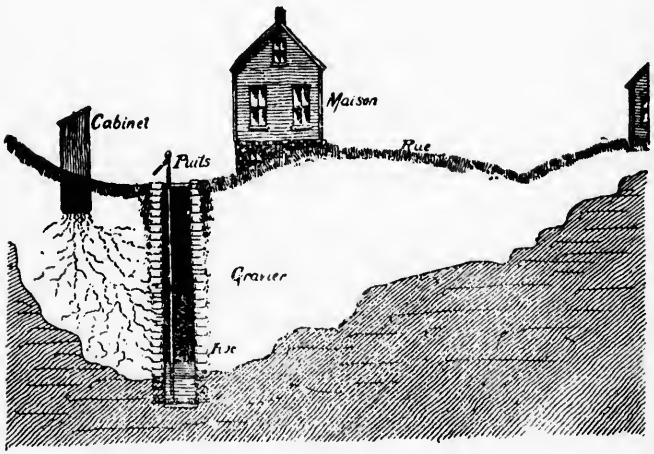


Fig. 9.

The water of the well is contaminated by the decomposing matters percolating from the closets to the well through the loose gravel.

The conquests of hygiene are now such that it will be henceforth easy, if not to completely rid society

To what cause must the serious cases of typhoid fever in the country be attributed?—Can this disease be completely eradicated?

of the epidemics of typhoid fever, at least, to reduce them to a minimum (Brouardel). In 90 cases out of 100, water is the distributer of this dreadful disease; the evil is apparent, the cause is visible, and the remedy, if not always easy to practise, is known; it lies in the purification of the water by all possible means.

24. DIPHTHERIA.—*If diphtheria were treated in the same rigorous manner as small-pox, its stay among our population would last but a short time.* Every one seems indifferent to the presence of this disease, which is so seriously increasing the number of deaths, here, instead of opposing to it all the powers of resistance and protection at our disposal.

Diphtheria presents itself under many different forms which can hardly be made distinct: croup, exudative angina, for instance, are some of its manifestations; it is therefore necessary, in cases of affections of the throat in a child, to call the physician in at once, in order that he may immediately prescribe the necessary treatment.

Croup is considered by hygienists as being of the same nature as diphtheria. Therefore, in all cases of croup, as well as in diphtheria, or variola, isolation and disinfection should be practised. (See by-laws.)

25. MEASLES, SCARLET FEVER.—Sometimes both are very malignant. The recovery from these diseases is specially to be feared as it is then that

24.—Are the same precautions to be taken against diphtheria as against small-pox?—How is croup to be regarded?

25.—What is to be feared during the recovery from measles and scarlet fever?

severe complications generally arise: affections of the lungs, in the former disease; those of the kidneys, in the latter. Consequently, the treatment should not cease at the same time as the malady, but the attendance of the physician ought to be continued long after the disappearance of the disease.

SMALL-POX.

26. SMALL-POX, OR VARIOLA.—This is the most dreadful of all the infectious diseases in its nature and in its ravages; but hygiene is omnipotent against it; we will then devote to it a special chapter.

History of small-pox.—In the last century, small-pox caused annually half a million of deaths in Europe; an epidemic raged every three years. Half of the mortality in children under ten years was due to small-pox; two-thirds of the blind persons in Europe lost their sight from it. In some countries, this disease destroyed, at one time, one-sixth of the population; the terror that it was spreading everywhere had largely increased the number of suicides. It spared no one, and the woman who bore none of its marks was regarded as a beauty.

27. INOCULATION.—Infectious diseases are distinguished from other diseases, 1o by the rapidity of their development among the population in which they make their appearance; 2o by not attacking the same person twice; in fact, except in case

26.—What is the history of small-pox during the last century?

27.—In what are the infectious diseases distinct from other diseases?

of peculiar susceptibility, no person is twice stricken down by the same infectious disease.

This last fact, recognized by every nation, gave rise, in the last century, to the idea of inoculation. Inoculation is nothing else but vaccination by the poison of small-pox itself.

This custom had become the more general, as every one was afraid of contracting the disease, and that derived from inoculation was less serious. The practice of inoculation reduced the rate of mortality from 1 in 5, to 1 in 50.

28. VACCINATION.—Vaccination, as every true fact, is the result of experience and observation.

A disease, appearing on the hands and arms, and resembling small-pox, though not spreading so quickly, had been noticed as prevalent among the people of the country; this disease was derived from cows, sheep, or horses. It had been also remarked that the persons suffering from this distemper prevailing at the same periods as epidemics of small-pox, were rarely attacked by the latter illness.

Both of those observations were communicated by the people to professional men; they lead to experiments, which, performed by learned men, finally corroborated the remarks made by the ignorant and poor people.

It was about the end of the last century that mankind was benefited by these important discoveries. In 1795, the illustrious Jenner, the father of

Upon what was the system of inoculation based? Was inoculation in great repute?

28.—How did vaccination succeed inoculation?—What is the name of the man who made that great discovery

vaccination, made his first experiments ; he published his report in 1798. His results were corroborated by Dr. Woodville, who, in two years, vaccinated 8,000 persons, exposing the most of them to contagion, either by contact, or by inoculation itself, without causing any deaths.

The new fact brought out by Jenner, and confirmed by Woodville, was soon recognized by all learned men, who have left us undeniable statistics which are still gaining in truth and strength.

Vaccination is an operation which consists in inoculating a person with a disease known as vaccine, found in some animals, specially in cows; vaccine is the best preventive remedy against small-pox.

29. ENGLAND.—This invaluable discovery which had become the subject of the most acrimonious discussions, has, finally, by the experience of nearly a century, been made a scientific dogma.

Instead of the dreadful spectacle offered by small-pox in the last century, a mere sketch of which has been given in this book, we now see the disastrous scourge gradually vanishing in the presence of Jenner's marvellous discovery. Another proof of what has been said here is added by the following figures.

Official statements published in England show that, previous to 1540, the deaths caused annually in that country by small-pox numbered 12,000; that, from 1841 to 1853, when vaccination was administered gratuitously, the number of deaths per year was reduced to 5,250; that, from 1854 to

How can vaccination be defined ?

29. What have been the effects of vaccination in England ?

1863, after the compulsatory vaccination bill had been passed in 1853, the annual rate of mortality was reduced to 3,351.

It can be seen by recapitulating the English statistics, that *the rate of mortality caused by small-pox has been reduced from* 184 *to* 11 *for every* 1,000 *cases.* (Ballard, Gayton, Guy.)

30. FRANCE.—The renowned French writer, Jules Simon, in speaking of vaccination and its effects in Europe, said that it had reduced the rate of mortality from 54 per cent to 12 per cent.

31.—GERMANY.—In 1884, the German government appointed a commission which was composed of vaccinators and anti-vaccinators, to inquire into the results of the compulsatory vaccination and revaccination law of 1874. The following are the conclusions of the report :—

In Prussia, the rate of mortality caused by small-pox had been 24.66 cases for 100,000 persons from 1847 to 1874, while it was only 2.18 for 100,000 persons from 1875 to 1831; in Austria, where no vaccination law had been in force, the mortality per year had reached 37.95 in the first period, and 44.77 in the second.

In the Prussian army, *not a single case of mortality has been caused by small-pox since the vaccination law has been passed,* while in Austria, the rate of mortality has been varying from 10 to 25 for every 100,000 inhabitants, and in France, from 8 to 28.

30. What is the opinion of the French authorities regarding vaccination ?

31. What is the opinion of the German authorities ?

Small-pox has almost completely disappeared from all the leading cities in Germany since 1874.

Such are the eloquent conclusions of the German report.

32. CANADA.—The above statistics ought to be sufficient to prove the unquestionable efficiency of vaccination, as well as the valuable services already rendered by this almost infaillible preventive. The remarks given have been made in a vast field, as the statistics include millions.

There has been enough said on the present subject ; however, we will add figures that will give a local interest to this important question, which ought not to leave any more doubt behind it.

In the town of Saint-Henry, near Montreal, the statistics for the scourge of 1885-86 were as follows :

Number of cases of small-pox up to Dec. 31st. 1885....	233
Number of deaths.....	117
Number of persons not vaccinated.....	115

During the epidemy, there were only two cases of small-pox among persons who had been vaccinated. "The scourge," said Rev. M. Décarie, who gives this convincing statistics, "was suspended by vaccination, instead of having been propagated by it as the foolish enemies of vaccination claim."

33. REVACCINATION.—The cases of contagion among persons who had been vaccinated lead learned men to the conclusion that, in these cases, the vaccination had not been done properly, or that the vaccine had lost its power.

32. Is there any statistics on the matter in Canada ?

33. In what circumstances is revaccination necessary ?

Children weakened by a rapid growth or a serious illness, are in danger of being attacked by small-pox in spite of vaccination; the vaccine is annulled or destroyed by the weakness of the system.

When making the inspection of schools, the vaccinator should be directed by this remark, which has been based upon numerous facts.

Revaccination should be performed when the marks of the first vaccination cannot be plainly seen. Small-pox is rarely found among persons who have been vaccinated twice.

The German military statistics above mentioned shows the efficiency of re-vaccination.

Re-vaccination ought to be made between the tenth and twentieth year.

As regards the mode of vaccination, it is better to use fresh animal vaccine.

The enemies of vaccination say that vaccine is a good vehicule for a large number of diseases; *this false pretension, which has been repeated to its utmost, has never been strenghtened by a single valuable proof.*

RECAPITULATION.

Typhoid fever may be transmitted by the air, but ater is more especially its means of transmission.

Water which have been become impure from the vicinity of drains is the best vehicule for this disease. Every property owner, in a city, as well as

When is revaccination necessary?—How is vaccination to be performed?—Is there any danger of contracting other diseases through vaccination?

in the country, ought to see, therefore, that the water-pipes do not communicate with the drain-pipes or the water-closets. Specially in the country, he will have to place the privies so as to prevent the liquid from percolating through the ground to the water in the well.

The same sanitary precautions are required during croup as during diphtheria.

Sometimes measles and scarlet fever are very dangerous; the convalescence from these diseases is often attended with complications.

During the last century, small-pox caused terrible ravages.

Innoculation had reduced the rate of mortality from 1 in 5 to 1 in 50; vaccination has reduced it to 1 in 100.

Vaccination is the best preventive against small-pox; the evidence given by the authorities, in England, in France, in Germany, and in all other countries, has made this fact unquestionable.

The best mode of vaccination is with fresh animal lymph.

Vaccination has never occasioned any other disease.

SUPPLEMENT.

DISINFECTANTS.

No. 1.—Solution of Chloride of Lime.

Chloride of lime.....1 pound.
Water.....2 to 4 gallons.

To be placed in the bed-room vessels; this mixture is specially useful for cellars, privies, water-closets, sewers, yards, and stables.

No. 2.—Solution of Corrosive Sublimate.

Corrosive sublimate.....1 ounce.
Permanganate of potash.....1 ounce.
Water.....8 gallons.

An efficient and inodorous disinfectant; as it contains pure mercury, it should not be left in lead, tin or copper vases or pipes. The red purple color of this solution will prevent any fatal error in the use of the poison; however, the doctor should be consulted before it is used.

No. 3.—Solution of copperas.

Sulphate of iron (green copperas)...1½ pound.
Water.....1 gallon.

No. 4.—Solution of Zinc.

Sulphate of zinc (white copperas)..1½ pound.
Common salt.....12 ounces.
Water..... 6 gallons.

No. 5.—Concentrated Solution of Zinc

Sulphate of zinc (white copperas)..3 pounds.
Common salt.....1½ pound.
Water.....6 gallons.

No. 6.—Solution of Carbolic Acid.

Carbolic acid.....1 pint.
Water.....3 gallons.

Carbolic acid of good quality is very dear.
It is good, says Baxter, only when it contains 2% of pure acid. (See By-laws of Board of Health).

FIFTH LESSON.

HYGIENE OF ALIMENTATION.

34. FOODS.—The name of food is given to any substance which taken into the stomach, helps to restore the strength of the body, and to maintain the warmth which is necessary to life.

Food substances may be divided into two great classes: nitrogenous foods and non-nitrogenous foods.

Nitrogenous foods contain oxygen, hydrogen, carbon, and nitrogen; they are also called *quaternary* because they are composed of four elements; in these foods, sulphur and phosphorous are also found, but in very small quantities.

Non-azotized foods, also called *ternary*, contain only three elements: oxygen, hydrogen, and carbon.

Azotized foods help to repair the tissues which are consumed by the simple workings of life; this waste is increased by exercise and work.

Non-azotized foods help to produce warmth.

The terms quaternary, azotized, nitrogenous, plastic, albuminous substances, restoring elements, proteids, albuminoids, are all nearly synonymous.

The principal nitrogenous substances are vegetable and animal albuminates: casein in milk; gluten, which is essentially a vegetable substance

34. What is meant by foods?—How are foods divided?—What is a nitrogenous food?—What is a non-nitrogenous food?—Do nitrogenous and non-nitrogenous foods bear another name?—Of what use are the azotized foods?—Of what use are the non-azotized foods?—Are there many synonyms of the term azotized?—What are the principal nitrogenous substances?

chiefly met with in the grains of cereals; and gelatine, in bones.

Non-nitrogenous substances are: fats, oils, starches, sugars, gums, etc.

The terms non-azotized, ternary, non-nitrogenous, respiratory, hydrocarbonated, carbo-hydrat, principles, all convey nearly the same meaning.

From a hygienic standpoint, foods are termed: *complete* and *incomplete.*

Complete foods are those which contain all the elements necessary to life; milk is one of these substances: with milk alone as a nourishment, we can live.

Incomplete foods do not contain all the elements necessary to life; meats alone, for instance, do not supply sufficient nourishment to repair our strength.

Besides the nitrogenous and non-nitrogenous substances which are supplied by the animal and vegetable kingdoms, and which are necessary for the subsistance of the human body, water and certain salts are also essential for the development and preservation of life. Table salt, or chloride of sodium, should be the only one added to our alimentation; the other salts which enter into the composition of our body are found in a fair proportion in our foods.

As the food substances are supplied us by the three great kingdoms of nature, the animal, the vegetable, and the mineral kingdoms, we shall study them separately in the above order.

What are the principal non-nitrogenous substances?— Are there many synonyms of the term non-azotised?— What is the hygienic division of foods? —What is a complete food?— What is an incomplete food? — Does the mineral kingdom supply man with certainfoods?— How shall we study these foods

To properly explain that all foods have not an equal nutritive value, we shall say that the most digestible food is that which supplies the system with the greatest quantity of restorative elements, and gives the least possible work to the digestive organs.

THE PRINCIPAL FOODS OF THE ANIMAL KINGDOM.

35. MEATS.—The greatest quantity of quaternary compounds, or nitrogenous substances, is supplied by the animal kingdom; consequently, those foods are more needful for the nourishment of man (See No. 34).

Numerous experiments have shown that animal nourishment is necessary to men who are obliged to perform an exhausting labor, and that without such nourishment they can not perform the same amount of work.

This may be explained by the following reasons:

As we have already said, meat contains a large quantity of azotized substances;

Therefore, nitrogenous substances of the vegetable kingdom, when taken in the same quantity as the nitrogenous substances of the animal kingdom, supply the blood with twice less nitrogen than the latter.

Meat contains fat and important salts.

As meat can be cooked in different ways, it is

What is a digestible food?

35. What does the animal kingdom supply us with?—Is animal nourishment necessary?—How do you explain the advantages of animal nourishment?

easily digested, and of easier assimilation than vegetables; that is to say, it is transformed into our tissues more readily than the latter.

In this country, we particularly feel the want of eating meat; this mode of nourishment gives more activity to our organs, and thereby helps to promote the animal heat which is required to withstand the rigor of our climate.

36. DIGESTION OF MEATS.—The meat of young animals is harder to digest; especially that of the sucking-pig, which contains too much gelatine.

Of all the different parts of the animal, the muscles, or the muscular fiber, that is, the lean meat, is the best; all the other parts have less nutritive value, and are not so easily digested.

The meat of animals killed for several days is less fatiguing to the stomach.

It is better to first fell the animals and then bleed them: thus, the loss of blood is not so copious.

All these circumstances affect the digestion of meats.

Meats are classified thus: red meats, white meats, and dark meats.

Red meats are the flesh of oxen, sheep, hogs, horses, asses, and mules; they contain a large quantity of azotized principles, and are very restorative.

White meats, which include veal, lamb, chicken, turkey, etc., differ from the former by the greater quantity of gelatine they contain.

36. What circumstances affect the digestion of meats?—Classify the meats?—What animals supply red meats and what are the properties of these meats?—Where do the white meats come from?—In what do they differ from the red meats?

Dark meats comprise game in general.

Game is not so digestible as the other meats, but it is more nutritious, because its flesh is not deprived of blood, as is that all butchered animals.

37. THE DIFFERENT WAYS OF COOKING MEATS.—Meat slightly roasted is preferable and more easily digested.

Boiled meat, although not so readily digested, is a nutritive food. Stewed meat is also very nourishing.

Frozen meat should not be thawed before being cooked; otherwise, a great deal of the nutritive liquid it contains is lost.

BROTH.—Meat-broth prepared by placing the meat in cold water is far better than that prepared with meat which has been previously placed in hot water.

In the latter case, the heat produces on the surface of the meat, a protecting coagulation which prevents the juice from being dissolved out into the water during the process of cooking.

Broth is a beverage which is more of a stimulant to the appetite than a restorative; therefore, in case of disease, a broth diet should not be considered sufficient unless specially prescribed by the doctor.

What is meant by dark meats?—What properties has game?

37. Which is the best way to cook meat?—Should frozen meat be thawed before being cooked?—How is broth made?—Is broth nourishing?

38. English Beef-Tea.—To a pound of strictly lean beef, add the same amount of cold water, and let the whole boil thirty minutes; then strain and season to taste.

American Beef-Tea—In a tin pot which closes hermetically, place successive layers of small pieces of meat and vegetables; close the pot; put it into boiling water, and leave it there for six hours. At the end of this time, by straining the contents of the pot, you obtain a real meat jelly which is extremely nutritious, and can be served either alone, dissolved in ordinary broth or diluted with lukewarm water.

39. Meat extracts.—The meat extracts in the market, whatever may be their name or the testimonials accompanying them, cannot be substitutes for meat: the muscular parts, which are the nutritive elements of the meat, are not found in these condensed preparations. The same as broth, they may be considered as stimulants to the appetite, and we can use them as such, but we must not rely on them as being sufficiently nutritious to replace meat.

SUMMARY.

Some foods are utilized to form the tissues of the body and to replace the losses it sustains; others help to maintain the warmth which is necessary to life; the first are called nitrogenous foods; the latter, non-nitrogenous foods.

38.—How is English beaf-tea made?—How is American beaf-tea made?

39.—Are extracts of meat as nutritive as meat itself?

Hygienically, foods are called complete and incomplete, according as they suffice or are insufficient by themselves for our nourishment and sustenance.

Foods are supplied by the three kingdoms of nature : the animal, the vegetable, and the mineral.

The chief food-stuffs of the animal kingdom are meat, fish, milk, and eggs.

Meat supplies us with azotized substances, and is necessary to the nourishment of man.

Certain circumstances render meats more digestible.

Meats are red, white, or dark.

There are different ways of cooking meats.

Broth does not supply a restorative beverage.

SIXTH LESSON.

40. HEALTHY CONDITIONS OF MEAT.—*Quantity and quality of fat.* The fat must be in sufficient quantity, but not in excess; otherwise, the proportion of albumen in the meat will be too low. Fat must be firm, not too yellow, nor of the consistency of jelly, nor stained with blood in any part.

Quality of the meat.—The muscles must be firm and elastic; a light moist color betrays a young animal; a dark color, an old one. If, after a few hours, a slight red juice oozes from a piece of meat on a plate, it is a good sign. Meat of good quality has a marbled appearance, such being produced by the interposition of thin fatty layers between and throughout the muscles.—(Lettreby)

If the color of the lean part of the meat is light, it indicates that the meat is becoming putrified, and the fact must be ascertained by running a knife through the flesh: in meat of good quality, the resistance is uniform; in decomposing meat, some parts are softer than the others; the smell from the knife will also help to ascertain the quality of the meat. The presence of cysticerci or trichinæ leave no doubt as to the diseased condition.

The marrow of a sound animal is firm and of a red, rosy color; if the animal was sick or in state of decomposition, it is soft, brown, and covered with black spots.

40. What are the characters of good fat?—What are the qualities of sound meat?—What signs characterise unwholesome meat?—How is the marrow of sound, and of unsound meat recognized?

The lungs and the liver must be examined to ascertain the presence of abcesses.

Sausages, black-pudding, ham.—Trichina, which is a dangerous parasitic worm, may be ingested by eating minced meats, because fraudulent tradesmen are liable to prepare such food from unsound meat.

When sausages, which should be cooked in water, betray a strong smell of ammonia, they should be discarded. (Parkes.)

Smoke-cured ham should be necessarily prepared from sound meat as the process of smoking does not destroy the parasitic germs which may exist in tainted meat. It is an absolute and important hygienic precaution to have such meats cooked.

41. Fish.—The nutritive value of fish is about the same as that of meat.

Small fishes are more easily digested; what makes fishes indigestible is the great quantity of water and oil they contain.

Acids, which have the property of dissolving fatty matters, should be used as con liments; lemon juice is preferable.

Persons who cannot easily digest liquid food, cannot properly digest fish.

The flesh of fishes soon becomes tainted; consequently, they should be eaten very soon after they have been taken.

Should sausages, black-pudding, and ham, be carefully inspected?—What shows that they are of good quality?—Does smoke-curing alone destroy parasitic germs in meat?

41. What is the nutritive value of fish?—What makes fish indigestible?—What is used to facilitate the digestion of fish?—Which persons do not easily digest fish?—Does the flesh of fish taint rapidly?

Fishes with *white flesh* (such as fresh cod, bass, pickerel, trout, perch, &c.,) are not very nutritious, although easily digested; fishes with red, or colored. flesh (such as salmon, sturgeon, shad) are nourishing, but heavy; delicate stomachs should abstain from them; fishes with fatty flesh (eel), are very heavy, not easily digested, but restorative.—(Michel Levy, Bouchardat.)

42. MILK.—The only complete food, that is to say, one uniting all the necessary nutritive elements (see No. 34,), is milk.

It should be considered as a very important factor in our nourishment.

Cow's milk contains 87.5 per cent of water and 12.5 per cent of solids, two parts of which are fat. It has a density of 1,030, compared to water at 1,000.

Milk is adulterated in different ways, but two more specially: by adding water or by removing the cream.

By means of an instrument called a lactometer, the quality of milk may be ascertained.

If the water which has been added to the milk is impure, the latter may be the means of conveying typhoid fever and other diseases. It is therefore very important to carefully watch the milkman with whom we deal; we should ascertain that he is careful of the cleanliness of his cows, and gives them sufficient nourishment. Milk is such an important part of our nourishment that we cannot be too careful with respect to it.

What are the different kinds of fish we have?

42. Is milk a good food? What is it composed of?—What is the density of milk?—How is milk adulterated?—Is it important to inspect the quality of milk?

What disease may be conveyed from the cow to man by means of the milk?

Bovine phtisis, that is consumption in the cow, is a very common disease amongst those animals; the chief cause of it is the insufficient ventilation of stables. It is reasonable to suppose that this disease may be conveyed to man by means of the milk.

It is beyond doubt that the milk of cows freely grazing in rich pastures is much superior to that of animals always kept in stables.

In cities, where the inspection of milk can never be perfect, it is always prudent to boil the food.

The dairy should be a separate apartment used only for dairy purposes. It should not be in the immediate vicinity of stables, pig-sties, privies, or manure-heaps. All utensils used in the milk-house and in milking should be scrupulously clean.

43. Eggs.—After milk, the most complete food, although not equal to it, is eggs. But the white and the yelk of the egg do not contain a sufficient quantity of salt and water to make them as useful as milk for nourishment.

The digestion of eggs depends greatly on the way of cooking them: the less they are cooked, the more digestible they are.

SUMMARY.

To be wholesome, meat should possess certain essential qualities.

Is the milk of pasture cows preferable?—In cities, what precautions are necessary with respect to milk?—What are the sanitary rules concerning milk-houses?

43. Are eggs a complete food for man?—Which is best way to cook an egg?

Minced meats are often unwholesome.

Fish provides a nourishment similar to that of meat.

They are not all of equally easy digestion.

Some persons do not easily digest fish.

The flesh of fishes is either white, red, or fatty.

Milk is a complete food.

Milk is especially adulterated by the addition of water or by the removal of the cream.

Certain diseases may be conveyed by means of milk.

Eggs, when slightly cooked, are nutritive and easily digested.

SEVENTH LESSON.

THE PRINCIPAL FOODS OF THE VEGETABLE KINGDOM.

Like the animal kingdom, the vegetable kingdom supplies us with azotized and non-azotized alimentary substances; but if these elements are sufficient for animals, they are not sufficient for man; vegetables contain too small a quantity of certain necessary principles to be considered complete foods. It requires too great a quantity of vegetable matter to supply the proportion of nitrogen which man loses daily. Yet, a vegetable diet, although in itself insufficient for our nourishment, must largely contribute thereto.

The vegetable kingdom furnishes for alimentation: cereals, vegetables, and fruits.

44. CEREALS.—The grains of certain cereals furnish flour, the primitive food of man, and from which bread is made. These grains contain a good deal of starch, or fecula, nitrogenous substances,—one of which is called gluten,—and mineral salts, specially phosphate of lime.

BREAD.—Bread is ordinarily made from wheat.

Fresh bread is more indigestible than stale bread, because it forms in the mouth, a pasty substance which is not easily acted upon by the saliva. (See No. 67).

Is a vegetable diet sufficient for the nourishment of man?

44. What do cereals furnish?—From what is bread generally made?—Which is better, fresh or stale bread?

Stale bread is the wholesomest because the water has partly evaporated.

The use of hot bread should be absolutely forbidden : its incomplete mastication (See No. 63), makes it a heavy food which the stomach cannot easily digest. It is only a caprice of the taste, and hygeian good sense should do away with it entirely

The crust of the bread is more substantial than the crumb; it contains less water and a larger quantity of restorative principles.

In all localities, the inspection of bread by the authorities, both with respect to quality and quantity, should be obligatory, and enforced. It being a food of the greatest importance, very often, in fact, the only food of the poor, anybody tampering in any way with the quality required for it by law, should meet with severe punishment.

OAT-MEAL.—Gruels and porridge are a Scotch dish ; that nation attributes the vigour of its subjects to this particular nourishment.

Oat-meal may be considered as an exceptionally strenghtening food, since it contains almost twelve per cent of nitrogenous substances; in it is also found an active principle which makes it a powerful stimulant (Samson); there is, besides, much iron.

Owing to these precious qualities of oat-meal, the different dishes prepared from it become important foods.

Why is state bread more wholesome ?—Why should we not use hot bread ?—Is the crust more nutritive than the crumb ?—Is the inspection of bread important ?—What are the alimentary preparations made from oat-meal ?—Is oat-meal a restorative food ?

Generally, it should be used at breakfast-time; for weak stomachs, gruel had better be taken at supper-time.

45. VEGETABLES.—This term is applied to all kinds of culinary herbs, plants, and roots, used for eating. Among vegetables, the most nutritive are potatoes, peas, beans; they are called *the meat of the poor;* these are the starchy vegetables.

The herbacious vegetables are: cabbage, lettuce, chicory &c.

To make our diet healthful, it is necessary to use a reasonable quantity of vegetables along with the bread and meat which are such important factors in our alimentation: vegetables, by means of the acids they contain, facilitate the digestion of meats; by their volume, they stimulate the action of the bowels, thereby prevent constipation, and diminish hunger.

46. FRUIT.—The vegetable kingdom supplies us with fruits, which conclude a meal so tastefully; they are useful foods, on account of the sugar they contain; but, taken in large quantities, they are purgative.

As a rule, fruit pleases all stomachs; nevertheless, the following choice might be made. Sweet fruits, (plums, peaches, figs,) suit irritable per-

At what repast shall we more particularly use oat-meal?

45. What is a vegetable?—Which are the starchy vegetables?—Which are the principal herbacious vegetables?—Are vegetables useful for alimentation?

46. Are fruit useful foods?—How should fruit be chosen?

sons; lean people require starchy fruits, (bananas, chestnuts); those subject to diarrhea should use astringent fruits (quinces, medlars), and those of a sanguine temperament, acid ones (gooseberries, cherries, oranges, and lemons.)

47. Alcholic liquors.—All fermented liquors contain alcohol.

From numerous experiments made with alcohol, the following conclusions may be drawn:

Pure alcohol taken in larger doses than one ounce and a half in twenty-four hours, is injurious to health.

One ounce of alcohol represents two ounces of brandy, as brandy contains fifty per cent of alcohol.

One ounce of alcohol represents five ounces of sherry, as sherry contains twenty per cent of alcohol.

One ounce of alcohol represents ten ounces of wine, as ordinary wine contains ten per cent of alcohol.

One ounce of alcohol represents twenty ounces of beer, as beer contains five per cent of alcohol.

Alcohol is not necessary either to health or life; persons who do not make use of it reach a more advanced age; this fact is proved, beyond doubt, by the mortality tables of English life-insurance companies.

47.—Do all liquors contain alcohol?—What dose of alcohol is injurious to health?—What is the alcoholic strength of the chief liquors?

Bad effects of alcohol—Alcohol does not protect against cold as has been proven by travelers in cold climates.

Neither does alcohol help to endure the heat: exhaustion is sooner felt by drinkers than by temperate people.

Alcohol does not facilitate physical labor, and rest is a better remedy for fatigue than the use of alcohol. The latter is always a heart stimulant, but it leaves the organ weakened, when its effects have passed off.

Intellectual labor is not improved by alcohol; when the imagination is excited by a dose of alcohol, the reasoning powers are also affected.

These truths should serve as a guide to our conduct. We must not seek in alcohol those properties which it does not possess.

48. WINES.—Wine is obtained from fermented grapes; like all fermented beverages, it contains more or less alcohol, as may be seen by the following table:—

	Percentage of alcohol.
Champagne wines contain from....	5 to 13
Bordeaux " " "	6 to 13
Burgundy " " "	7 to 14

Does alcohol protect against cold or heat?—Can it facilitate physical or intellectual labor?—What conclusions may be drawn from the above facts?

48. Do all wines contain alcohol?

	Percentage of alcohol.
Sauterne wines contain from....	11 to 18
Marsala " " "	15 to 25
Madeira " " "	16 to 22
Port " " "	16 to 23
Sherry " " "	10 to 25

When a wine contains more alcohol than the analysis of its kind permits, it is evident that pure alcohol has been added to it.

According to their color, there are two sorts of wines, viz: red wines and white wines. Red wines are made from blue grapes, the skin not having been removed; the coloring matter of the pulp, dissolving in the juice gives the wine its color. When the juice is immediately drawn off, white wine is the result; this may also be obtained from the juice of white grapes.

Red wines contain less nitrogenous principles than white wines. (Michel Lévy.)

Drinkable wine should be at least a year old before that time, it is heavy, causing heart-burn and colic.

Wine is generally taken diluted with water; this mixture should be made at meal-time, as wine mixed long beforehand, deteriorates, and becomes an insipid drink. (Berthelot.)

What do you conclude when a wine contains more alcohol than analysis allows?—Judging them by their color, how many sorts of wines are there?—Which is the most nourishing wine?—How old should wine be to be drinkable?—Should wine be mixed with water?

Wines, on account of the quantity of alcohol they contain, should be used very moderately, if not dispensed with entirely.

49. BEER.—Beer is obtained by the infusion and fermentation of barley and hops.

It contains as much as eight per cent of alcohol.

A pint and a half a day is about the quantity consistent with good health.

50. COFFEE, TEA.—Coffee and tea are the most common domestic beverages, and the most harmless ones, when taken in moderation; but, if either of them be made too strong, it causes palpitation of the heart, and sometimes brings on nervous troubles.

Both of these beverages are nourishing, as they prevent organic waste; therefore, they are called anti-waste foods, their active principle being strongly azotized.

They are the favorite beverages of workmen and soldiers, whom they protect against a rapid loss of strength; they enable the student to perform his intellectual labor with greater ease.

What may be deduced from the analysis of wines?

49.—From what is beer manufactured?—What is its percentage of alcohol?—What quantity of beer may be safely taken?—

50.—What are the effects of tea and coffee?—Are they nourishing beverages?

Are they good for the workman, the soldier and the student?

There are two kinds of tea: the black and the green.

Green tea contains more volatile oil, and is more often adulterated than black tea; it is, therefore, considered less wholesome.

SUMMARY.

The vegetable foods do not suffice for the nourishment of man.

The vegetable kingdom supplies us with cereals, vegetables, and fruits.

The grains from which flour and bread are made are derived from the cereals.

All bread is not wholesome.

Public inspection of bread should be enforced.

Oat-meal supplies us with gruel and porridge.

Vegetables are herbacious or starchy.

They are necessary to our nourishment.

Fruit does not equally suit everybody.

Fermented liquors are all alcoholic.

The use of alcohol is not so useful as is generally supposed.

All wines contain more or less alcohol.

There are red wines and white wines.

Drinkable wines should possess certain essential qualities.

Beer sometimes contains a great deal of alcohol.

Taken with moderation, coffee and tea are the less harmful beverages.

Are there several sorts of tea? — Which is the healthier?

EIGHTH LESSON.

THE PRINCIPAL FOODS OF THE ANIMAL KINGDOM.

51. IMPORTANCE OF THE MINERAL KINGDOM IN OUR NOURISHMENT.—The third kingdom, known as the mineral kingdom, although not so important as the animal and vegetable kingdoms, supplies us with valuable substances which cannot be dispensed with by the human system without danger of death.

52. TABLE SALT, (Chloride of sodium).—The different salts needful to our constitution are nearly all found in sufficient quantity in the food we take except chloride of sodium, or common salt, which plays an active and important part in our nourishment. If the use of salt is dispensed with in our diet for a long period of time, serious troubles may arise.

It is therefore a mistake to look upon it as a mere condiment, for it is also a food.

53. WATER.—Water is a aliment: it is such an intimate part of our body that a corpse completely dried up weighs only a few pounds.

51. Does the mineral kingdom play an important part in our alimentation?

52. Should common salt be considered a condiment only?—Is common salt an indispensable food?

53. Is water a food?

Water as a liquid food is also the means of favoring the ingestion and absorption of the salts necessary to our nutrition, and which frequently are not found in sufficient quantities in solid foods.

It is very important to know the source that furnishes the water we drink.

Drinking water should be clear; free from disagreeable odor; of an agreeable taste; aerated, holding in solution small amounts of various salts, especially carbonate of lime and common salt. Water contains much more of the latter salt than of all the others combined.

Rain may be considered as the source of all the waters distributed on the surface of the earth, or in its depths. Sea-water is not drinkable.

We will now consider the principal kinds of water.

54. WELL-WATER.—Well-water is much used in the country, where it is generally pure and beneficial.

In towns and villages, well-water cannot possess equally good qualities: the neighborhood of sewers, cesspools, grave-yards, and the impregnation of the soil with decomposing matters, are all causes which should make us look upon such water with distrust.

How is water a food?—Is it important to make a careful choice of drinking water?—What are the qualities of drinkable water?—Whence are derived the different kinds of water?

54. Is well-water good?—Has this water the same qualities in towns and in villages?

The water of wells that have been sunk near stables or privies, may become impure through infection from animal refuse matters; and it may be owing to the pernicious custom of having wells in such dangerous neighborhoods that we can account for the death-dealing diseases and the malignant fevers, which, of a sudden, fall upon country places, presumably enjoying a salubrious climate. The selection of a proper place for sinking a well should be made only after very careful reflection. (Fig 9, page 40).

55. CISTERN-WATER.—Cistern-water is seldom potable, it being derived directly from the rain-water collected from house-roofs, and carrying with it organic dust and metallic substances, such as lead; being, moreover, stagnant and devoid of air, it can be available only for domestic uses others than alimentation.

56. SPRING-WATER.—These are generally the most wholesome of waters; their temperature being constant, cool, and refreshing. When of normal composition and containing no salts in excess, they are the most hygienic waters. So much so that at the Convention of Hygiene held in Germany, in 1874, they were declared the only pure waters, being always protected against contamination, so common with river-water in particular.

What precautions are necessary in the sinking of a well?

55. Is cistern water drinkable?
56. Are spring-waters wholesome?

Spring-waters are often mineralized, and, according to the salt they contain, present advantages which are every day utilized in medecine : in such cases, they are called mineral waters.

57. WATER OF LAKES.—Lakes supplied by watercourses the purity of which is beyond doubt, furnish water superior to that of rivers, on account of its uniform temperature, and the rocky nature of the bed of the lakes.

58. STREAM AND RIVER-WATERS.—In this country, which is so remarkable for its immense water basins, the salubrity of these waters is undoubted ; consequently, they present all the qualities of drinkable water. The purity of our waters are altered only by very powerful and special circumstances, such as are met with in the neighborhood of towns and villages where sewers empty into the streams and rivers.

River-waters are very much inferior to spring or lake-waters, owing to their frequent impurities, and the changes of temperature they undergo in summer.

59. TEMPERATURE OF POTABLE WATER. — The water supplied to the people should always be fresh : hence, the necessity of drawing it from

Are spring-waters sometimes mineralized ?

57. Are lake-waters superior to river-waters ?

58. Can river-water be polluted ?—Is it better than spring or lake-waters ?

59. How is the freshness of water preserved ?

reservoirs where the exterior temperature does not too greatly affect it. It is also imperative to provide means of conveyance which shall protect it from the action of heat: this result is now-a-days obtained by means of subterranean conduits.

The temperature of drinking-water should be 10° Centigrade, or 50° Fahrenheit.

60. Snow and Ice-Water.—Freezing renders water purer by precipitating from solution the greater part of its salts; on the other hand, the air which is necessary to digestion decreases in ice-water, which, therefore, becomes heavier. Water may also be fouled by the quantity of organic matter it contains; as snow is generally taken near houses, the snow-water should be filtered and boiled before being used for drinking purposes. (Dr. Baker Edwards). An epidemic of cholera which prevailed in Russia, in 1832, was attributed to the use of snow-water.

61. Ice-Water.—The use of ice-water is very injurious to health; irritation of the bowels (diarrhea, cholera, etc)., so frequent in the hot season, may be reasonably attributed to it. To counteract the bad effects of ice-water in factories, where its use is so common, it is recommended to mix oat-meal with it; as the fatigue of labor increases the thirst, the above precaution should be enforced.

What should be the temperature of drinking water?
60.--Is snow-water wholesome?
61.—Is ice-water injurious to the health?

Avoid placing too great a quantity of ice in the pitcher or tank, because the ice-water thus obtained is far from being wholesome, its heaviness very often disturbing digestion. Vessels in which the water is surrounded with the ice are far better than those in which it is placed directly in the water.

Although ice is purer than the water from which it is formed, it is, nevertheless, necessary to carefully select the places where the provision of it is made.

Ice taken on running water is generally wholesome; but, in the neighborhood of certain factories, as well as in pools or ponds, it is generally polluted.

62. WATER ANALYSIS.—It is difficult, by scientific processes, to determine the insalubrity of water; it is therefore necessary to take all precautions for the sinking of wells, the choice of a spring or of a considerable supply of water from lakes, rivers, and springs.

Nevertheless, the following practical advice may be of some use:

All waters of doubtful purity should be boiled.

When water is heavy and indigestible because it is devoid of air, it should be shaken so as to make it absorb the necessary oxygen.

What precaution is necessary with regard to ice-water in vessels?—Where should ice be taken?

62. Is it easy to verify the insalubrity of water?—What should be done when water is too heavy, devoid of salts, or too salty?

Water devoid of salts, particularly of the sodium salt, should have added to it a certain quantity of this indispensable substance, but without this addition being too manifest.

Water which is too salty should be boiled, then the excess of salt will settle.

Good drinking water should not contain more than 0.2 of organic carbonated matter or more than 0.02 of organic azotized substances for every 100,000 parts of water.

When carbonated and nitrogenous organic matters exceed respectively 1.00 and 0.50 per 100,000 parts of water, the latter is not drinkable.

According to Parkes, one gallon of potable water should not contain more than 8 grains of solid matter.

The pollution of water is not always due to the amount of organic matters it contains, but more to the quality of those matters; a point not to be readily decided by chemical processes.

SUMMARY.

The mineral kingdom plays an important part in our alimentation.

What quantity of organic matter may water contain without being unfit to drink?—When does water become unfit to drink?—What amount of solids should potable water contain?—To what is the pollution of water especially due?

It supplies us with the salts and water which we could not dispense with for several days without dying.

Water, to be potable, that is to say good to drink, should possess certain qualities.

We have well-water, cistern-water, spring-water, lake and river-waters.

Water should always have the same refreshing temperature.

Drinkable water should be at 10 degrees centigrade.

Snow and ice-waters are heavy and indigestible.

The places where the provision of ice is made should be carefully selected.

Ice-water is very injurious.

As it is difficult to determine by scientific means when water is insalubrious, it is necessary to take all possible precautions when digging wells, chosing a spring, or providing for a large supply of water from lakes and rivers.

NINTH LESSON.

HYGIENE OF DIGESTION.

It is not sufficient to know the different kinds of aliments and their particular properties, it is also necessary to understand the mechanism of nutrition and the different phenomena to which it gives rise in the digestive organs. This is what we shall study in this lesson.

63. DIGESTION IN THE MOUTH. MASTICATION.—Mastication is the first operation which takes place.

It consists in the division of food by means of the teeth, so that it may be more easily digested in the stomach and the intestines.

There are three kinds of teeth, viz : eight incisors, which are the first in the front of the mouth, four above and four below ; four canine teeth, which follow immediately, one on each side ; twenty molars, eight of which are termed small and twelve, large ; the latter are the back ones (See fig. 6, page 22).

The different names given to the teeth are thus explained : the incisors, which are sharp, cut up the food substances ; the canines, which have a conical

What does hygeian digestion comprise ?

63.—What is mastication ?—How many kinds of teeth are there ?—Explain the different names given to teeth.

shape, tear them apart; the molars, having a rough and rugged surface, crush and grind them up.

The conclusion to be drawn from the varied structure of the teeth is that they are all necessary, and that we should use them for the purpose of slow and perfect mastication.

64. HYGIENIC PRECAUTIONS.—Teeth are indispensable, it is therefore important to preserve them in good order by all possible means. Every morning, while dressing, and after each meal, if possible, they should be washed with fresh water. If certain dentifrice preparations are used, chose, in preference, the powders; nearly all liquid dentifrices contain injurious acids. Nowadays, dentifrice soaps are mostly used.

Notwithstanding the care given to the teeth, very often certain calcareous deposits, called tartar, form in layers over them; these deposits help to destroy the purity of the secretions of the mouth, and, to get rid of them, it is necessary to have recourse to a dentist.

A dentist should be consulted as soon as a tooth is found to be decayed.

It must be remembered that bad teeth and a good stomach are incompatible; when the teeth decay, the stomach gets out of order.

What conclusions do you draw from the varied structure of teeth?

64.—What care is necessary for the teeth?—When is the intervention of the dentist necessary for the care of the teeth?—What relation is there between the teeth and the stomach?

65. DOES SUGAR DESTROY THE TEETH ?—Here we are specially alluding to children.

As sugar is an important part of the nourishment of children, we shall only discuss the excess of it, and its mode of preparation. Excess of sugar is certainly injurious to the teeth and stomach, especilly when sugar that is not pure is used. By itself, it does not seem to be injurious, since the decay of the teeth is very rare on negro plantations, where the negro children absorb a great deal of raw sugar.

It is generally the mode of preparing sugar that renders it injurious to health ; the coloring matter and the other ingredients in prepared sugar make it adhere more to the teeth, and, thereby, more easily induce decay in these organs.

66. IS FRUIT INJURIOUS TO THE TEETH ?—The acid of the fruit may affect the teeth ; to counteract this acidity, it is necessary to either eat bread, or take a cooling beverage, when eating fruit. It is especially after eating acid fruit that it is necessary to wash out the mouth carefully.

67. INSALIVATION.—Insalivation is the penetration of food by the saliva.

Saliva is a liquid which is continually being secreted by the glands of the mouth, especially during mastication, in order to help transform the food into a pasty mass.

65.—Does sugar destroy the teeth ?

66.—Has fruit an injurious effect on the teeth ?

67.—What is insalivation ?—What is saliva ?

The usefulness of saliva should be well understood. In the first place, it helps to soften the food which is afterwards more easily swallowed, and secondly, it plays a still more important part: thus, fecula, which is the nutritive part of a vegetable (See No 45), cannot be dissolved in the stomach if it has not been acted upon by the saliva, which transforms it into an important element of nourishment.

It is about the seventh month after birth that the salivary glands acquire a sufficient development; then the saliva begins to be secreted, and helps the work of digestion. It is for that reason that young children should not be subjected to artificial nourishment before that period.

68. DEGLUTITION.—Such is the name given to the operation by which food passes from the mouth into the stomach.

The food substances pass through the following cavities: the mouth; the pharynx, which, placed at the back of the mouth, is a cavity common to food and air; the œsophagus, which is a narrow canal extending from the pharynx to the stomach (See fig. 6, page 25).

What is the use of saliva?

What does the saliva act upon?

At what period of life does saliva begin to be secreted?

68. What is deglutition?—What cavities does food pass through from the mouth to the stomach?

69. HYGIENIC PRECAUTIONS.—The insalivation of food is an indispensable process to assure easy and perfect digestion in the stomach and intestines; the abundance of saliva is not a drawback, and any habits which tend to seriously diminish its quantity should be immediately abandoned. In some persons, the use of tobacco may produce this injurious effect, and they should be reasonable enough to discontinue its use.

Starchy foods, such as potatoes, bread, and all kinds of vegetables, not being digested in their natural state, should be subjected with care to the action of the saliva, in order that they be transformed into an assimilable substance; should this transformation be performed in too incomplete a manner in the mouth, digestion is thereby impaired. Smokers who expectorate a great deal, and who hope to replace such expectoration with water, seriously injure their digestion.

Mastication and insalivation will prevent the accidents of deglutition: a morsel of food which is swallowed too hastily, instead of penetrating into the œsophagus, will fall into the air-passage, that is to say, the larynx, which is situated in front of the œsophagus, and may thus cause suffocation, and sometimes death; this same accident may also be caused by speaking or laughing when eating; the epiglottis, which is a valve situated at the base of the tongue, and which closes the opening of the larynx during the act of swallowing, then remains open, the morsel falls into the air-passage and so the accident happens. (See fig. 6 and par. 14.)

69. Is it important to insure the supply of saliva?

Are starchy foods absorbed in their natural state?—Does deglutition expose us to certain accidents?

70. DIGESTION IN THE STOMACH.—The stomach is a membraneous bag which comes after the oesophagus, and which is placed at its highest part of the belly. It is bent round on itself; it has two openings: an entrance, called the cardiac opening and an exit, called the pyloric opening.

The stomach continues the work begun in the mouth, this work consists in the softening of the food, its dissolution, and, finally, its transformation into a soft mass called *chyme.*

The duration of digestion in the stomach is from four to five hours.

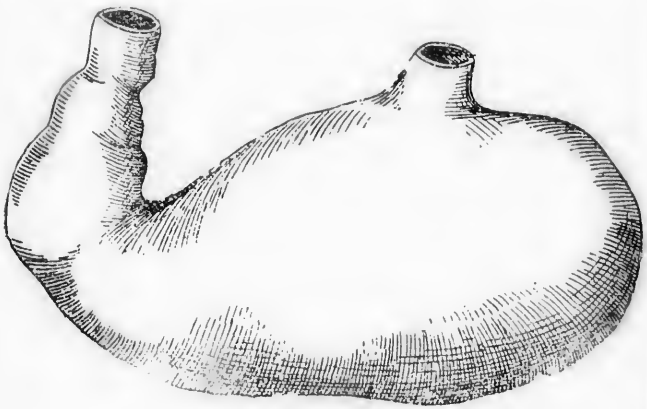


Fig. 10.—The Stomach.

Meat especially, is digested in the stomach; starchy

70. What is the stomach?—What part does the stomach play?—What is the duration of digestion?—What are the food-substances digested especially in the stomach?

foods, in the mouth. Here, the principal agent of digestion is the saliva; in the stomach, it is the gastric juice.

71. HYGIENIC PRECAUTIONS.—One should never eat fast. To eat slowly, and to masticate properly before swallowing are two elementary laws of hygiene, which must be respected throughout life. The first moments of digestion should be quiet. Even during the meal, tranquillity is required for digestion. Study may cause headache; bodily work or violent exercise may arrest digestion, and render indigestible a nourishment which, otherwise, would have been easily assimilated.

72. IS IT RIGHT OR WRONG TO DRINK WHILE EATING?—The moderate use of wholesome water of an agreeable taste, facilitating the secretions of the mouth, as well as these of the stomach, should be considered perfectly healthy, provided that it be not drunk with every mouthful of food, but during a slight interruption in the meal. *Dry eating* is an exaggerated precaution, which does not tend to increase insalivation or the digestibility of food.

73. DIGESTION IN THE INTESTINES. — The intestines, or bowels, are that part of the alimentary tract extending from the stomach to the anus, or extremity of the lower bowel.

They are divided into small and large intestines.

71. What hygienic precautions are necessary immediately after meals?

72. Is it right to drink while eating?

73. Where are the intestines situated?—How are they divided?

Digestion in the intestines is effected by means of several juices; there is the pancreatic juice, supplied by the pancreas, a small gland situated behind the stomach; then, the secretions of the various glands which line the interior of the bowels; and, finally, bile, which is furnished by the liver.

The above-mentioned liquids especially help to digest fats and the starchy foods which have not been sufficiently acted upon by the saliva.

74. WHAT FOODS ARE MOST EASILY DIGESTED?—The answer is easy. It is those which are most easily dissolved and transformed by the juices of digestion, either of the mouth, the stomach, or the intestines. Every one has not the same appetite, the same tastes, the same powers of digestion: this explains why an aliment which is easily assimilated by one person, becomes injurious to another.

The person who secretes but little saliva will soon be tired by starchy foods, whilst another whose stomach furnishes insufficient gastric juice will no longer digest meat; again, fatty nourishment does not suit those in whom the bile and pancreatic juices are inadequate.

75. DIET. MIXED ALIMENTATION.—Man is omnivorous, for he gathers from all the kingdoms of nature the food-stuffs required for his nourishment.

A meal should consist of a reasonable proportion of meat supplied by the animal kingdom, of amyla-

How is digestion performed in the intestines?—What is the use of pancreatic juice and bile?

74.—What are the foods most easily digested?

75.—Should the alimentation be mixed?—On what principle should alimentation be based?

ceous substanees found in the vegetable kingdom, and of salts from the mineral kingdom.

A man loses every day a certain amount of nitrogen and carbon; those substances must be recovered from a nourishment which furnishes them; the aliments from one kingdom of nature alone are insufficient for this purpose.

The quantity of food cannot be fixed exactly, as it varies with each individual.

A continuous diet composed, solely, either of meat, of fat, or of amylaceous substances does not suffice; it rapidly leads to disease and death.

The proportion of nitrogenous substances should vary according to the climate and the temperature; it should be diminished during the hot weather.

The quantity of water required daily should be more considerable if the other foods are taken in less amount, and *vice versa*. Heat augmenting waste, a larger proportion of water becomes necessary as temperature rises and animal combustion increases.

76. MEALS.—The hard-worked man and the active child require three meals a day; the professional man who leads a sedentary life can manage with two.

The nature of the meals should also be different: in the first class of persons above-mentioned the nourishment should be substantial; for less active people, light meals are more suitable.

Does the quantity of food vary much?—Is alimentation by either meat, fatty, or starchy foods alone sufficient?—Under what circumstances should the proportion of solid and liquid foods be modified?

76.—Should the number of meals vary.—Should the nature of each be the same?

As a rule, morning and noon are the best hours for hearty meals; it is not healthy to make a practice of dining copiously in the evening.

The meal should be taken slowly, and be considered an important act, as health depends greatly on the way we eat,

SUMMARY.

It is important to understand the mechanism of alimentation and the different phenomena to which it gives rise.

Mastication, which is the first act of digestion, should be performed slowly and carefully; the varied structure of the teeth shows the part they should play and, likewise, their importance in alimentation.

Insalivation is necessary for the digestion of amylaceous foods in particular.

Deglutition exposes us to certain accidents.

As the teeth are indispensable the greatest care should be given them.

Sugar and fruit destroy the teeth.

The stomach is the principal organ of digestion; meats are digested in it.

The moderate use of an agreeable beverage is beneficial to digestion.

The intestines digest fats.

All foods are not digested in the same way.

Alimentation should be mixed.

The laborer and the professional man should fare differently.

It is very important to know how to eat properly.

What are the best hours to take hearty meals?—How should the meal be taken?

TENTH LESSON.

HYGIENE OF THE PERSON.

77. IMPORTANCE OF RESPIRATION AND ALIMENTATION.—Hygienically, the two most important vital functions are respiration and alimentation; two functions, by which man derives from the air and from the different kingdoms of nature over which God has placed him as a king, the necessary elements to restore his strength and sustain his life.

These two functions are equally nutritive functions. Air, as well as food, helps to form the tissues and produce animal heat; it supplies us with oxygen, as food does with nitrogen and carbon. It is therefore necessary to properly understand that animal life merely consists in our assimilating or appropriating, by means of the air, pure oxygen, and by means of alimentation, nitrogen and carbon in fixed proportions; animal life is really the assimilation, or absorption, of these three bodies: oxygen, nitrogen, and carbon.

It is therefore necessary to study these two functions, respiration and alimentation; the application of all the precepts drawn from such a study results in the preservation and the prolongation of life.

77. What are the two most important vital functions?—Do those functions equally assist in nutrition?

Apart from the principal rules of hygiene with which the study of respiration and alimentation furnishes us, are there any other important sanitary precepts?

In the first place, it is necessary to know how to breathe and eat, and to be fully cognizant of what we breathe and eat: all the other hygienic precepts, although important, are secondary. Yet, to complete one's hygeian education, it is necessary to study them, and we will do so in the following lessons.

As the hygiene of early childhood embraces details which are too lengthy for such an elementary work as this, we will begin with the hygiene of the school-children, at an age, when, for the first time, they are separated from their families, and take their first steps in society.

SCHOOL HYGIENE.

78. SITE.—It is important to make a proper selection for the site of a school. As much as possible, high ground should be chosen; dampness in the yards and cellars should be avoided; in country schools, the latter not being very deep, should be ventilated with the greatest care.

The abundance of light which is always important either in a dwelling or in an ordinary building, is doubly so in a school: the house should be constructed in such a way as to be always accessible to the rays of sunlight.

Shall we study the hygiene of early childhood?

78. What are the principal rules which should guide in the selection of the site of a school-house?—What is specially important in the situation of the school?

The neighborhood of public building, factories, and railway stations, should be avoided as much as possible, isolation being required to procure tranquillity; what should be sought for is freedom from all outside noise and disturbance.

The above conditions, although of great import, do not always find their application, being often sacrificed to municipal interests.

79. SIZE OF SCHOOLS.—Pulmonary activity being greater in children, they possess more breathing capacity than adults, and require, therefore, more breathing space. The school-room being, at least, ten feet high, each scholar should have from twelve to fifteen feet of floor space. Those dimensions are requisite and may be considered sufficient to avoid active ventilation during class time. However, during recess, abundance of fresh air and light should be allowed toenter: in winter-time, to prevent the lowering of the temperature by this free ventilation, extra heating is necessary.

As we have already said, fresh air should enter by the top part of the windows or near by, vitiated air is generally drawn off by the stove or chimney; in rooms where there are no stoves, a special ventilating shaft is required, the interior of which should be smooth, that the escaping air may meet with no resistance. (See fig. 2 et 3).

In this case, the temperature of the appartment,

Is the neigborhood of factories and public building suitable ?—Are these facts respected ?

79. What should be the amount of space allotted to each child in a class-room ?—How should schools be ventilated ?—What should be the temperature ?

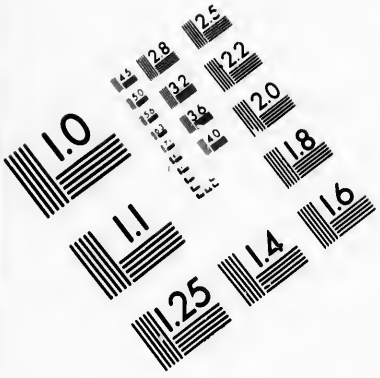
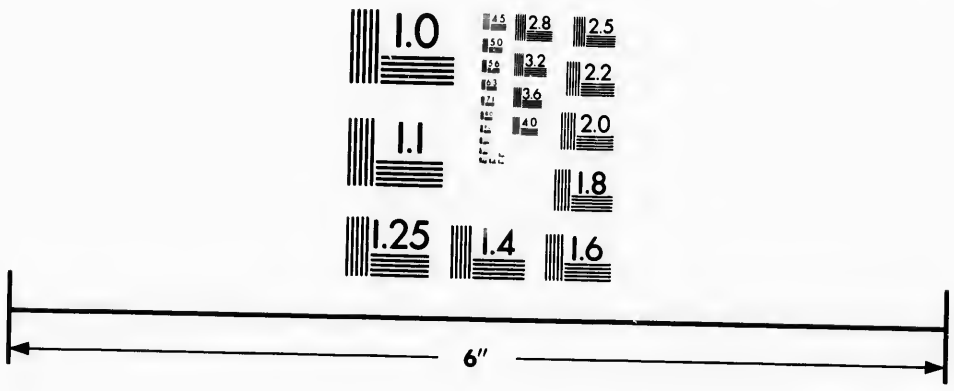
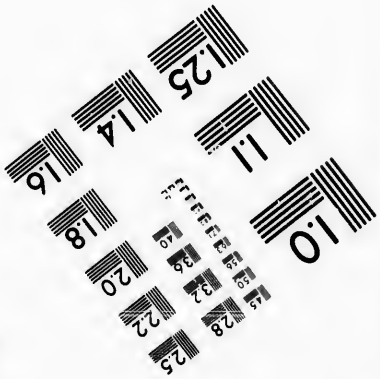


IMAGE EVALUATION TEST TARGET (MT-3)





Photographic Sciences Corporation

23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503

which should not exceed 65o F., is the only means of causing the air to rise in the vent-shaft.

80. At what age should children be sent to school.—The brain of a child under seven years of age has not yet attained the development required to endure intellectual labor ; before this period, the proportion of water it contains is too great, and the organ too soft ; it is therefore necessary to wait till the time of life mentioned has been reached before sending children to even elementary schools.

This rule does not apply to infant, or kindergarten schools where the education is more physical than intellectual, appealing as it does, more to the bodily senses, — the touch, the eye-sight, and hearing—than to the intellect ; so, no brain-fatigue is produced ; on the contrary, those schools gradually prepare the child's intelligence for the greater strain of elementary schools.

In infant schools, muscular activity is especially cultivated ; the varied postures allowed the body spare and strengthen the incompletely formed frame ; imagination and memory are but slightly taxed. Forming, as they do, the stepping-stones to higher education, those institutions should be encouraged and established by the authorities in every locality when their need is felt.

81. Plan of Construction. — The following conditions may be used as a guide in the building of schools :

80. At what age should a child be sent to school?—Does this rule apply to infant schools?—Of what advantage are those schools?

81. What are the requisite conditions for the building of a school?

1. Two sides, at least, of the school should be open to fresh air and light; for this purpose the school-house should be built at least sixty feet from the neighboring buildings.

2. Not more than three stories should be used for classes.

3. In each class-room, a floor space of at least fifteen feet should be allotted to each scholar.

4. In each class-room, the space taken up by the windows should be at least a quarter of the area of the apartment, and the distance from the furthest desk to the window should not be more than one and a half the height from the floor to the highest part of the window.

5. The height of the class-room should not exceed fourteen feet.

6. Fresh air should enter near the windows; vitiated air should escape by the ventilating chimney placed in the wall. The opening of this ventilating shaft should be at the lower part of the wall, on the same side as that through which the fresh air comes in.

7. There should be water-closets on each story if the water supply is sufficient.

8. The school-house should not occupy more than half of the ground furnished.

Those essential requirements should be well known; even so, the erection of a school should never be begun, without the autorities having previously obtained the advice, 1o of persons experienced in teaching, as their knowledge and counsels are always useful and to the interest of the pupils; (2o of competent physicians and sanitarians; 3o of the Board of Health.

It is time that every one should awaken to a good knowledge of school hygiene, embodying as it does, the health and strength of civilized people; this knowledge would improve the miserable condition of many of our country, and even city schools, where healthy and sickly children are indiscriminately huddled together under the most defective hygienic circumstances.)

82. FURNITURE.—The bench and desk should be in accordance with the growth of the scholar: pupils of different builds should not be placed on the same bench, otherwise, some will suffer from the restraint imposed upon their attitudes.

Fig. 11.

If the desk is too high it causes a deformation of the shoulders.

Is it important to know all these sanitary conditions?

82. Should the bench and desk be proportionate to the height of the scholar?

The vertebral column, which is straight in the new-born infant, assumes it natural curvature only when the body is in a vertical position. If the child always remain in a sitting posture, the posterior concavity of the lumbar region will become a convexity ; besides, lateral deviations may appear in other parts of the spine.

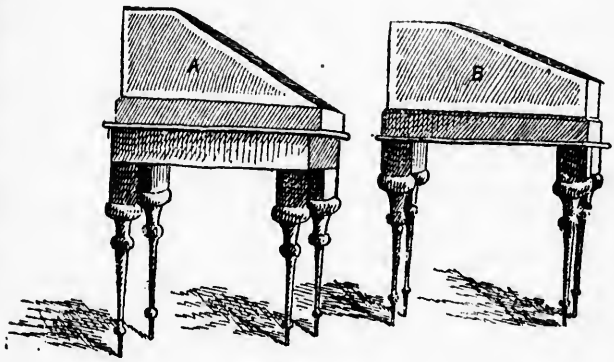


Fig. 12.
Inclination of the reading-desk.

Fig. 13.
Inclination of the writing-desk.

A faulty posture may cause troubles in various other organs: when the body is inclined forward, the action of the ribs and the motions of respiration are interfered with : the breathing becomes weak and shallow; the cells of the lungs, especially those of the apex, are not completely dilated, and the air and blood do not circulate therein sufficiently ; hence,

How are the deformities due to faulty postures explained ?—Are there others accidents due to faulty postures in schools ?

diseases of the lungs, of the heart, and of the whole nervous system.

Therefore, the position of the scholar should be as nearly as possible a vertical one, and the sitting posture should be alternately changed to a standing one.

Fig. 14

Fig. 15

The scholar at the piano.

A separate desk and bench are the hygienic furniture for each scholar.

The desk should be high enough to allow the scholar to rest his fore-arms and elbows on it without fatiguing his shoulders. If the desk is too high

What should be the posture of the scholar?—What is the hygeian furniture for a school?—What shall be the height of the desk?

it causes the shoulders to become deformed; if it is too low, it produces round-shoulders and other accidents already mentioned.

The desk should be sloping; anybody can note how soon the sight is fatigued when the eyes are fixed for some time on an horizontal surface. The desk should be made so that it can be more inclined for writing than for reading; in the first instance, the top should have an inclination of 20°, and in the second, of from 40° to 45°.

The bench should be deep enough to rest the seat and the greater part of the thigh; if it is too high, a rest for the feet will be required. Each bench should be provided with a back sufficiently high to rest half of the body.

The strictest cleanliness is required in schools, but luxury should be avoided in order not to make too great a contrast with the homes of the larger number of the scholars; otherwise, they will be the means of disgusting them with their family, and the cause of great misfortune.

The deformities of the frame caused by unnatural postures are not confined to class-rooms alone: the pupil at the piano, the seamstress on her chair, and the young girl who laces too tightly, present very frequently the same distortions. Unnatural postures indulged in every day for many years can produce but one result: permanent deformity; the different parts of the frame, like the green branches of a young tree will easily follow the direction given to them: such a direction, good or bad,

Should the desk be inclined ?—What should be the size of the bench ?—Is luxury allowable in schools ?—Are deformities of the frame met with only in schools ?

if maintained for some time can scarcely ever be modified.

83. LIGHTING.—The child should be able to use its eyes without fatigue, and the apartments should be lighted in such a way as to protect its sight.

Clarified oils give a light which is less injurious to the eye-sight than that of gas, which emits caloric rays that are too intense.

("Care should be taken, when gas is used, to avoid all possible pollution of the air by the products of combustion or by the gas itself. Ventilation should be diligently attended to during the use of such light and of all others that foul the air.

"Electric light may be injurious by its dazzling brightness; it should, therefore, be mitigated by globes of suitable thickness and tint. It has the advantage of not being yellow, and of resembling sunlight, of having no products of combustion to vitiate the air, and of giving off but little heat."

The flame in all those lights should be steady and in no way try the eye-sight of the pupil. With artificial light, study should be shorter than by solar light.)

The light of the sun should be softened by curtains or blinds of a greyish color which changes less than blue or green; this tint should also be used for the walls, as white causes a very fatiguing

83. How should school-rooms be lighted? — Are clarified oils better than gas?—What of electric light?—What should be the color of the blinds and walls?

reflection of light. The ceiling should be a neutral gray.

Fig. 17.

The seamstress seated.

Study-room desks should be placed so that the light may come from the left side.

Artificial light requires to be wisely controled, and it should be distributed so as to strike the object more than the eye.

The black-board, so much in use nowadays, should not be placed between two windows, or the light will be thrown into the eyes of the child who is facing the board. As the windows should be on

How should the desks be placed?—How should artificial light be used?—Where should the black-board be placed in the class-room?

the left side of the class-room, the black-board might then be placed on one of the other walls.

Fig. 18.

The seamstress seated.

84. INTELLECTUAL LABOR AND MUSCULAR ACTIVITY IN SCHOOL-LIFE.—Teachers and parents glorify in having children learned beyond their years: nobody seems to remember that even plants and flowers in which the growth has been too hasty, do not come to full maturity. The development of the mind should not be detrimental to that of the body; both, by regular study and training, should be formed naturally and without fatigue or deleterious effect.

84. How should the child's system be developed?

Fig. 19.

Fig. 20.

Young girls who lace too tightly, present the same deformities that are caused in schools by disproportionate benches and desks.

The child who enters school at the age of seven is a very delicate being who must be treated with care : till he reaches the age of fourteen, it will be necessary, as much as possible, to alternate three quarters of an hour of study with a quarter of an a hour of recreation : it would not be right to subject him for whole hours to intellectual labors ; his system requires more exercise.

What time should be given to intellectual work ?

The object of muscular exertion is to bring into play all the voluntary muscles ; this result may be obtained by several light exercises ; such as, walking, running, and jumping ; that part of gymnastics which consists in lifting heavy weights, requiring violent efforts, must be wisely controlled, and is out of place in young girls' schools.

The hours of recess and recreation should be entirely devoted to muscular exercises ; reading and all that requires intellectual labor, such as music lessons and the like, should be strictly prohibited.

SUMMARY

Hygienically, the most essential functions are respiration and alimentation.

It is important to know how and what to breathe and eat.

The other hygienic precepts are only secondary.

The utmost care should be used in choosing a site for a school-house.

Abundance of light and isolation from all noises, are two most important considerations which should determine the site of the school-house.

The following requirements should be imposed in the plan of construction of a school :

Two sides of the house, at least, should be accessible to air and light.

The class-rooms should not occupy more than three stories.

The space taken up by the windows should be a quarter of the area of the apartment.

What are the proper exercises for children ?—Should recess be entirely devoted to physical exertion ?

The height of the class-room should not exceed fourteen feet.

Vitiated air should escape by outlets made in the walls.

The building should not occupy more than half of the ground provided.

Each scholar should have fifteen square feet of floor space, the class being ten feet high.

Ventilation should be effectuated without lowering the temperature of the room.

The temperature should not exceed 65o F.

Children should not be sent to school before seven years of age.

Education in infant schools is a species of primary school apprenticeship.

The child being more active has greater breathing capacity than the adult.

The seat and bench should be proportionate to the height of the child.

When they are disproportionate to the growth of the pupil they cause deformities and other serious troubles,

The desk should be neither too high nor too low.

The seat should be deep enough and have a satisfactory support for the pupil's back.

Luxury should not exist in schools,

The faulty posture of the child at school, of the pupil at the piano, of the seamstress, and tight lacing in young girls, cause deformities similar to those arising from the use of disproportionate benches and desks.

Solar light in schools should be softened by the gray colors of the walls.

The light should come from the left side.

The black-board must not be placed between two windows.

The time should be divided between intellectual labor and physical exercises.

Physical exercise is preferable to systematic gymnastics.

Before the age of fourteen, three quarters of an hour of study should alternate with a quarter of an hour's recreation.

ELEVENTH LESSON.

SCHOOL-HYGIENE

(Continued)

85. DISEASES COMMON TO SCHOOLS.—Certain diseases develop more specially under the influence of school-life whilst others are merely common to youth; from a hygienic point, this distinction is not necessary. It is expedient to mention the principal ailments met with.

86. DISEASE OF THE NERVOUS SYSTEM.—The nervous system, like the other parts of the child's system, not yet having acquired the force of resistance which exists at a more advanced age, is exposed to be easily affected by intellectual work.

Nervous temperaments,—which are recognized by the small development of the muscles, by the vividness of the impressions, and the quick motions,—should be especially looked after; it is they who require a judicious distribution of intellectual labor and physical straining.

The nervous system is more sensitive in woman;

85.—Are diseases common to schools distinct from those of early youth?

86.—Is the nervous system of the child easily affected by disease?—Who are exposed to troubles of the nervous system?—Is the nervous system more sensitive in women?

little girls should have special care, and maternal tenderness should follow them every-where.

Amongst young girls, as well as among children of a nervous disposition, moderate exercise is most useful to promptly recuperate the lowered vitality.

It is on the eve of examinations, at the end of the year, when the brain has been over-taxed that nervous accidents often occur; as soon as there are signs of impaired health, the physician should be consulted without delay.

A disease peculiar to youth is that termed "growing fever"; it presents the following symptoms; weakness, loss of appetite, impaired digestion, disturbed sleep, and rapid physical growth. The advice of a physician is required for its treatment,

87. RHEUMATISM.—It is generally when a child has reached the age of eight that he is exposed to contract this disease, which does not exist in early childhood.

It is usually caused by dampness : in such cases, great care is to be exercised, and the child should not be allowed to remain in class with wet clothes on, but should be sent home without delay : a few hours absence from the class-room should be granted so as never to interfere with a sanitary precaution of such importance.

Are nervous troubles to be feared in young girls?—How are these troubles overcome?—Is there a disease peculiar to youth?

87. At what age does rheumatism appear?— How is it often caused in childhood?

88. DISEASES OF THE EYES.—It is well known that the blood flows more abundantly to the brain under the influence of study, in the same way as it does to the stomach during the first hours of digestion. The eyes, which play such an active part in intellectual labor, receive a greater afflux of blood ; they become congested, that is, they retain a greater quantity of blood than in their normal state, and the tension of the eye is thus increased. A repetition of these states causes trouble in the sight, especially shortsightedness.

Nearsightedness is an eye trouble which prevents a person from reading at a greater distance than twelve inches.

Insufficient and badly distributed light, in most cases, is the cause of this infirmity which affects twenty-five per cent of school-children.

The persistent efforts which the scholar is obliged to make in order to read, and the habit he contracts of bringing his book too near the eyes, are the main causes of this marked weakness of the sight which grows from generation to generation in such a degree that scientists are seriously alarmed at the grave consequences which may follow in future generations.

For this reason alone, it is plain that the distribution of work requires to be modified in our schools. and this fact should be considered in the hygienic programmes of the schools of the future ?

88. How do you explain the disorders of the eye-sight amongst school-children ?—What is myopia ?—To what is it due ?—How so ?—Should the distribution of work be modified ?

89. HYGIENIC PROGRAMME OF SCHOOLS.—Apart from insufficient light, several causes from different sources contribute to the development of short-sightedness; the following precautions will serve as hygienic rules for study at school:

1. The temperature should be uniform, never exceeding 65° F.; higher, it increases congestion of the brain, to which study already predisposes.

2. The feet should be always dry; any compression from tight shoes or elastic garters should be avoided; the same rule applies to all other parts of the body, especially to the neck and waist.

3. The posture of the child should be upright; he should not hold his book, when reading, or the paper on which he it writes, nearer than twelve inches.

4. Attentive studies should be avoided before breakfast and after a hearty meal.

5. The most complete abstention from intellectual strain is required during convalescence, more particularly during that of fevers.

6. Short-sighted persons should wear glasses with which they can be enabled to read at a natural distance of twelve inches.

7. Light should always come from the left side; if insufficient, it should be procured from the right, but it should never enter the class-room from the front or the rear.

89. What other precautions should be taken to prevent the increase of near-sightedness.

8. The eye-sight is relieved by often looking upward.

9. A few moments should be employed every day in looking to a distance.

90. CONTAGIOUS DISEASES.— Diptheria, scarlet fever, measles, and small-pox, which are diseases peculiar to childhood, would be less frequent if the superintendence of schools were more strict.

It is the duty of the teacher to inform the authorities, without delay, of any case of contagious disease in his school, or elsewhere among his scholars.

Any child belonging to a family where a contagious disease exists should be excluded from the school.

Any child affected with a contagious disease should not return to school without a certificate of a physician.

The certificate should particularly specify that disinfection has been performed.

Disinfection in any contagious disease should be made only by order of the doctor, when the municipal authorities do not attend to it; no child should be readmitted to the school without a certificate from the attending physician.

In infant schools, especially, no children suffering

90. What are the contagious diseases peculiar to childhood ?—Is it the teacher's duty to inform the authorities of any case of contagious disease among his pupils ?—What should then be done ?—Are certain eye-diseases contagious ?

from catarrhal or granular ophthalmia should be accepted, as those eye-diseases are contagious. Such children should not be allowed admission till the disease has been perfectly cured.

PHYSICAL EXERCISES AND CALISTHENICS.

91. DEFINITION. — Bodily exercises, or simple gymnastics, are walking, running, jumping, etc.

Disciplinary gymnastics, or calisthenics, comprise certain methodical motions imparted to divers muscles of the body, under careful direction: such training becomes real physical culture.

Free, natural bodily exercises are superior to the more methodical and constrained athletic ones. Their action is more general; they accelerate the whole circulation, develop the bones and muscles, open the pores of the skin, and do not, like a great number of those more systematic ones, concentrate their whole activity on a few groups of muscles. Apart from this advantage, they possess also the one of being always taken in the open air, and not in the closed, and over-heated halls of athletes, acrobats, and gymnasts.

Physical exercises are required, and should occupy a prominent place in school-teaching: they are the only preventive of the greater number of deformities and diseases of youth in schools; taken with

91. What are physical exercises?—What are calisthenics?—What distinction do you make between bodily exercise and calisthenics?—Is physical exercise necessary?

moderation, they produce a beneficial effect on all the great functions of the body: more so on respiration, circulation, and nutrition, the foremost vital functions.

92. EFFECTS OF EXERCISE ON THE RESPIRATION.—Respiration is increased; there is an augmentation in the quantity of oxygen inhaled and in the carbonic acid exhaled.

93. EFFECTS OF EXERCISE ON THE CIRCULATION.—The movements of the heart are quickened; the continuous stimulation produced by the frequently renewed muscular contractions, increases the circulation throughout the vascular system. (Paulier).

94. EFFECTS OF EXERCISE ON NUTRITION.—Respiration and circulation being more active, the nutritive functions are directly benefited by this increased activity; appetite becomes sharper, digestion more easy, repair more perfect, secretions more natural, and, as a final result, the intellectual functions are more energetic.

Intellectual and moral energy is often at the mercy of physical strength; the healthy man has a will, the sick man has none.

The depraved man who has exhausted his natu-

92. What are the effects of exercise on the respiration?

93. What are the effects of exercise on the circulation?

94. What are the effects of exercise on nutrition?—Is intellectual and moral energy affected by the state of the body?—What is necessary to insure harmony between the intellectual and physical forces?

ral or acquired strength by drinking, will be more hesitant and broken-down morally than physically.

The convalescent will falter.

The aged man will seek in vain the firmness of youth.

In order, therefore, that intellectual and physical forces may harmonize, it is necessary that the latter should not languish, but be in full activity: the different physical exercises will promote this harmony,

95. EFFECT OF EXERCISE ON THE SKIN.—The skin resembles the lungs in its action; like them, it produces a sort of respiration; that is to say, it absorbs the oxygen of the air, and exhales carbonic acid and watery vapor.

Exercise favors the secretion of sweat, and, as the activity of this function is an excellent sign of health, it should be freely encouraged; in the meanwhile, exposure to cold should be carefully avoided, the sudden checking of perspiration causing several diseases.

Persons who do not perspire, should try to promote perspiration, by means of exercise and friction.

If the skin does not act properly, the heat produced by exercise remains in the body causing langor and, sometimes, feverishness.

95. What is the part played by the skin?—What are the effects of exercise on the skin?—What is necessary for persons who do not perspire?—What happens when the skin does not act?

96. DIFFERENT KINDS OF EXERCISE.—Walking is the simplest and best of exercises, for it brings into action all the muscles of the body, and stimulates more or less, the most important functions—such as, respiration, and circulation,—according to the greater or less rapidity of the walk.

RUNNING.—Running is an excellent means of increasing the elasticity of the muscular fibers and the suppleness of the joints. To run properly, it is necessary to hold the head erect and the shoulders thrown back; the legs must not be lifted too high, and the sole of the foot should fully bear on the ground, for running on tip toe cannot be long kept up.

JUMPING.—Jumping has also its rules. When falling, the legs should bend, to avoid shaking the internal organs; for the same purpose, only the toes should first touch the ground. so that the fall may be broken and the shock mitigated. In this way, sprains and fractures so often caused by jumping, may be prevented.

97. BATHS.—Bathing is an excellent hygienic exercise, and the sure way of making the skin act regularly; all exercises affect the muscles specially, bnt the bath acts both on the muscles and on the skin.

96. What is walking?—What precautions should be taken in running and jumping?

97. How does the bath act?

Bathing should form part of the hygiene of youth and of the whole life of man; if we look upon the matter from the stand-point of real gymnastics, we would say that a bath-room is more important than a gymnasium, the only purpose of the latter being to particularly develop certain parts of the body. It is to be hoped, that before long, swimming will form part of the programme of the physical education of childhood.

98. ADVICE TO BATHERS.—Never take a bath immediately after a meal, but wait at least three hours.

Do not bathe if you feel hungry, as this feeling is equivalent to exhaustion or fatigue.

The best time to bathe is before breakfast or towards noon.

Instead of gradually immersing the body, one should plung into the water, to avoid the shock upon the nervous system.

As bathing is exercise in the water, it is necessary to move about like a swimmer, to render the bath beneficial.

Everybody cannot equally prolong a bath; persons should come out of the water as soon as they begin to feel cold; this sensation comes sooner or later according to individuals.

After a bath, one should vigorously rub the body with rough towels; if the reaction is slow, brisk exercise should be taken, it being the best stimulant;

Is bathing a good practice?
98. What advice is to be given to bathers?

the bluish color of the lips indicates that the reaction, or the heat, is slow in coming.

If bathing does not act as a stimulant, it is better to give it up.

99. SEA-BATHING.—The same precautions should be observed here as in ordinary bathing.

This bathing is suitable to persons who suffer from weakness, but not to those who are affected with any organic disease.

Children and old people are those who derive the worst effects from sea-bathing.

Prolonged sea-bathing is often dangerous.

The bath, sea-bathing specially, should not be prolonged beyond half an hour.

In all kinds of bathing, it is important to fill the ears with wadding, because the shock of the water against the drum of the ear is often the cause of accidents.

RECAPITULATION.

Certain diseases are due to the influence of school-life; others are peculiar to childhood: with regard to hygiene, the principal ones met with are to be mentioned.

99. What are the directions for sea-bathing?—To whom is sea-bathing useful?—Is it good for old people and children?—What caution is to be observed in sea-bathing?

Diseases of the nervous system are frequent in schools.

The nervous temperament, more salient in the young girl, predisposes to such affections.

Children insufficiently cared for, are often exposed to dampness, and, subsequently, to contract rheumatism.

Brain-fatigue from overstudy, is often accompanied by eye-troubles, more especially, near-sightedness.

Defective lighting, among many other causes, produces short-sight.

Contagious diseases would be far less frequent in childhood, if more care were exercised in schools.

No child who has been ill from a contagious disease, should be readmitted to school without a physician's certificate.

Physical exercise differs from gymnastics.

Bodily exercise should have more consideration among teachers; it is the best preventive of school ailments.

Exercise has a stimulating action on the circulation, it increases the activity of the digestive functions, recuperates physical strength, and invigorates the intellectual faculties.

The physical debility of the body reduces the intellectual powers and moral energy.

Exercise favors the secretion of sweat which is so beneficial to health.

Walking is the simplest and most hygienic of all exercises.

Running and jumping should be subjected to certain hygienic rules.

Bathing regulates the action of the skin.

Bathing is one of the healthy exercises of youth.

The bather should remember the precepts of hygiene and be governed by them.

Sea-bathing is more suitable to persons suffering from depressed vitality than to those affected with serious aliments.

TWELFTH LESSON.

PROPER CARE OF THE BODY.

Either at school or in the workshop, a child should know, and have known from its earliest age, the care to be bestowed upon its body.

100. THE DAILY BATH, OR WASH.—This is the simplest of baths, the daily washing of the body; the face, neck, and hands especially, require to be cleaned several times a day,

The bathing of the whole body, with a sponge, is urgently required every day; it should be followed by brisk rubbing of the skin with a coarse linen towel. Those frictions should be habitually light, but, they may be more vigorous if the person feel unwell. The free action of the skin favors health; it renders the person less apt to contract diseases; in fevers, one of the first symptoms, heat, is felt in the skin, and the disease is all the more serious if cutaneous action is impaired.

The daily bath should be taken with the water at a moderate temperature, from 70° to 75° Fabr., or 25° to 30° Centig.

Hot or cold baths should not be taken without the physician's advice.

100. What bath is here alluded to?—How should the body be washed?

The daily bathing of the body does not always require the use of soap, as one might suppose; the oily exsudation should not be removed, as it protects the skin, renders it less irritable, less sensitive to the action of the atmosphere; the folds and wrinkles where there is too much secretion should alone be regularly cleansed with soap,

101. GARMENTS FOR THE COLD SEASON.—During the cold weather, we should prevent too great a loss of the heat of the body by wearing suitable clothing; by storing up our natural warmth we protect ourselves against the cold.

102. UNDERCLOTHING.—The different materials used in the manufacture of our garments have not all the same properties: some are good conductors of heat: others, bad. To prevent the loss of animal heat, recourse should be had to materials that are bad conductors; such as wool. The use of woolen garments during the cold weather is indispensable; but one should choose soft and yielding wool which will not irritate the skin as would a coarse fabric,

Flannel possesses the above qualities, and should be used in the making of underwear, especially of the undershirt.

Persons whose skin is very delicate and easily irritated may wear linen or cotton next to the skin.

Is soap often required?

101. How should we protect ourselves from the cold?

102. What materials should be used for under-garments?—Which is the most hygienic woolen material?—Are there not some people who cannot wear flannel?

Flannel is especially necessary to the weak and the aged, to women, children, and convalescents.

It heightens the action of the skin, and, when the latter secretes normally, the lungs experience relief; for, as already stated, there is a species of supplementary respiration performed by the skin. Weak persons, therefore, who might dread lung diseases, should wear flannel as a hygienic measure. Two children, one of whom wears flannel and the other linen, perspiring profusely after great exercise, will not be equally exposed to take cold or to contract illness; the one wearing the flannel is in less danger as the material absorbs the perspiration, and prevents sudden chilling of the surface of the skin.

103. HEAD-COVERING.—In young children, the blood supply of the brain being more considerable than in the adult, it is a bad habit to cover the head too warmly; woolen hats and caps of a suitable texture to allow a certain dissipation of heat, are the hygienic coverings for children. Fur caps suit older persons better.

104. NECK-TIES AND SCARFS.—Heavy scarfs keep the throat too warm, and so expose to cold and throat diseases; among people where this article of clothing is not worn, those ailments are much less prevalent. In extremely cold weather, this manner of protecting the throat, is perhaps necessary; it must be remembered, however, that

To whom is flannel especially necessary?—How does flannel act?

103. What is the best head-covering against the cold

104. Is the use of comforters and scarfs hygienic?

it is required to preserve only the natural heat of the body; the dissipation of extra heat should be favored, for, when there is an excess in any part of the body, sweating and subsequent chilling are the results. The hygienic scarf should, therefore, be light.

105. OUTER-GARMENTS.—Those, differing in this from underwear, do not require so porous a texture for perspiration; the layer of air included between the under and outer-clothing suffices for the evaporation of the sweat. Outer-garments should then be made of a close material through which the bodily heat cannot easily escape.

The clothing of children should not be too heavy seeing their greater activity; after play or exertion an overcoat should be put on to avoid chills.

A tight belt, or sash, is as reprehensible in the school-boy, as the close fitting corset is in a woman; all pressure around the neck by the scarf or collar, around the waist by the belt, around the legs by elastic garters and on the feet by tight shoes, is equally disastrous to health.

106. CLOTHING FOR THE WARM SEASON.—During the winter, to protect ourselves from the cold, loss of bodily heat must be prevented. In summer, for protection against the heat its penetration through our clothes must be thwarted. The nature of the

105. Should outer-garments be made similar to underclothing?—What clothing should children wear?—Should the sash or belt be worn tight by the school-boy?

106. How are we to protect ourselves from the heat?

clothing material is not alone active as a preventive; the color should not be neglected: white or a kindred color, is the most hygienic during the hot season, as it does not absorb heat half as rapidly as black or dark colors do.

Warm clothing is still more requisite in our climate during the transition from winter to summer; spring, in Canada, is not, as in other countries, a distinct season; the changes from heat to cold are rapid and unexpected; therefore, at this period of the year, even more so than during the cold but less changeable winter weather, sickness is more apt to be contracted, because winter-clothing is left off too soon.

During this transitional period, it is fit to modify the outer-garments, but the under-clothing should remain the same till summer; then, the heavy woolens may be replaced by the lighter merinoes.

Colds and common diseases of the chest in all ages, during this season, are generally caused by the too hasty putting aside of warm clothes at the end of winter.

Those remarks on spring hygiene may also be applied to autumn.

107. CLOTHING AND CONTAGIOUS DISEASES.—Luxurious outer-garments often cover unclean un-

Is heavy clothing very necessary in spring?—Should lighter garments be put on in spring?—To what are those persons exposed who leave off their winter-garments too soon?

107- May clothing become the means of transmission of communicable diseases?

erwear; the skin naturally suffers from such blamable neglect. Apart from the immediate effect of dirtiness, the unclean clothing and garments that are but rarely changed may become the vehicles for the transmission of communicable diseases. (Parag. 16).

Skin-diseases are the result of uncleanliness; besides, the healty action of the skin, so essential to sound health, is lessened by filthiness.

During the prevalence of epidemics, it is urgent to be particular with regard to clothing; if one happen to come into contact with an infected person, a change of garments becomes necessary, and even disinfection by sulphur should not be delayed. (Paragr. 22,)

108. THE FEET.—The feet, to which little attention is given, are certainly the parts of the body that require the most attentive care. They should be washed with cold water every evening during the summer; if sweating is profuse, a little alcohol may be added to the water, but soap and hot-water should not be used. If this practice cannot be regularly carried out, the feet should be at least well rubbed every evening with a dry flannel.

The toe-nails should be pared regularly; they should be cut square across so as not to allow the sides to sink into the flesh and cause *ingrowing nails*.

What care should be taken during an epidemic?
108. How should the feet be cared for?
How should the toe-nails be pared?

When the skin is anywhere thickened, forming a callosity, it should be shaved or scraped off, with a *dull* knife, the foot having been previously bathed in hot-water. *Corns* and *bunions*, which are so painful, may in this way be prevented.

The above affections are more often the result of wearing tight shoes or those made from very hard leather. The shoe should be made to fit the foot, and not the foot obliged to fit the shoe. Lasts made from casts of the foot give the best-fitting shoes.

Particular attention should be given to the heels: too high, they render difficult the maintenance of the equilibrium; in delicate persons and in young girls whose nervous system is so excitable, high heels may bring on serious troubles; placed too far behind, the heels force the toes violently against the leather, producing corns and other callosities; too far forward, they shorten the arch of the foot which, in its natural form, gives assurance in walking and running, and elegance to all the movements of the body.

The feet should always be kept warm; numberless ailments are the consequence of cold and damp feet. With a hygienic shoe, faulty circulation which causes cold feet does not exist; the daily care given to the feet will maintain the natural heat so much needed for health.

109. THE HANDS.—The hands, coming in contact with a multitude of objects, need excessive care;

What should be done when the skin of the foot is thickened anywhere?—How should the shoe be made?—What are the consequences of badly-fashioned heels?—Should the feet be kept warm?

109. Does the care of the hands require particular attention?

they may easily transmit disease-germs; this manner of propagation is often overlooked. During the cold weather, the hands are subject to chilblains, which may be avoided by never washing them in cold water, especially before going out into the cold.

The hand being a most delicate organ of touch, the habit of wearing gloves is the best means of preserving this precious quality; persons who require, by employment or occupation, great delicacy of touch should always wear gloves.

The nails are often left dirty; they should not be neglected; they should be pared regularly, but left long enough to protect the ends of the fingers; no dirt should be allowed to accumulate underneath them,

110. THE MOUTH.—(See hygiene of the teeth, parag. 64.) We shall only add a word here to what has been said: the gums, as well as the teeth, are worthy of our attention; they often become soft and bleed easily; the necessary firmness may be acquired by washing them every day with water containing a few drops of tincture of myrrh.

111. THE HAIR.—The scalp is more naturally exposed to uncleanliness than any other part of the body: it deserves, for that reason, special attention. The surest way of keeping it in good condition, is to use the hair-brush every morning; vigorous

Is the use of gloves to be advised?—How should the finger-nails be cut?

110. What care should be bestowed on the gums?

111. How should the hair be kept clean?

brushing is even more necessary than washing; it stimulates the circulation, heightens the action of the skin, and contributes to increase and strengthen the growth of the hair.

Pomades should be used only by those whose hair is dry and brittle.

Cleanliness of the head being more difficult to obtain in children, the hair should be kept short; it should be well washed every morning, care being taken to dry it thoroughly before the child goes out. The habit of having children's hair cut very short, or clipped, is not always devoid of evil; so insignificant as it appears, it may cause a considerable flow of blood to the sensitive brain of the child, and develop accidents; in such a case, medical advice should be sought.

When young girls have a good growth of hair, it should not be cut; otherwise, it will never attain its full length.

The care to be bestowed on the hair and scalp should be all the more assiduous and attentive, as baldness seems to be greatly increasing.

112. THE EARS.—The ears, like the face, should be cleaned with water only; the use of the ear-pick, in any form, should be discountenanced; the inner parts of the ear generally care for themselves.

Are pomades suitable?— Should children wear long hair?—Should young girls' hair be cut?

112. How should the ears be cleaned?

The practice of piercing the ears of young girls is far from approvable; this slight operation is often followed by intense inflammation due to the irritability of the delicate skin, and to the inattentive precautions taken in performing it.

Ear-rings often help to deform the ears, a prudent choice of those ornaments should be made; they should be of pure metal.

(Blows on the ears, or on the head with the hand or any instrument should never be permitted for any reason whatsoever; it is cruel to strike a person so, and it is often producive of irreparable injury. The same may be said of pulling the ears.)

113. (THE NOSE.—It should receive its share of attention: cleanliness is urgent; but picking it with the fingers, pushing hard substances up the nostrils, and worrying the sensitive lining-membrane in young babies, are practices that are to be discouraged, as tending to produce disease.

The continuous use of strong perfumes, long exposure to irritating gases, and tobacco smoke driven through the nostrils, often tend to destroy or weaken the sense of smell. One should be very careful of any treatment employed; it more prudent to consult a competent specialist as soon as any trouble becomes manifest in those organs, especially in children.)

Is it a good practice to pierce the ears of young children?—Are earrings injurious?—Should blows on the ears be tolerated?

113. What precautions are advised in the care of the nose?

SYNOPSIS.

The body should be washed every day.

Soap is not an indispensable toilet article.

Protection against the cold is obtained by preventing the dissipation of bodily heat.

Garments should be made from a material that is a bad conductor of heat.

Under-clothing should be of soft, elastic wool.

Flannel sometimes irritates the skin.

It is hygienic for weak people, as it assures healthy action of the skin.

In children, flannel will save from many accidents.

The head-covering should not be too warm.

Comforters and scarfs should be light.

Outer-garments should be of a closer and thicker material than that of under-clothing.

Tight belts are detrimental to children.

Protection from outside heat is obtained by preventing it from reaching the body.

The color of the clothing material is important during the hot season.

White is hygienic, and does not absorb heat so quickly.

It is essential, in spring, not to leave off warm clothing too soon.

The outer-garments should first be modified; later on, the inner ones.

Clothing may become the means of transmission of infectious diseases.

During an epidemic, it is urgent to change the clothes and to disinfect them when we have come into contact with an infected person.

Enough care is not bestowed on the feet.

They should be kept scrupulously clean.

Filthiness of the feet and tight shoes induce several infirmities.

Warm feet are essential to health.

The hands touch a great number of unclean objects, and may transmit communicable diseases.

They should be washed often.

The nails should be attended to, being left long enough to protect the finger-ends.

The gums sometimes require attention.

The head should be keep clean ; the brush is the best means of so doing.

Pomatum is required only by persons whose hair is dry.

Children's hair should not be too short.

The ears should be cleaned with care.

Piercing the ears in young children is a bad practice.

Blows on the head should never be given.

The nose should receive careful attention.

THIRTEENTH LESSON.

ACCIDENTS AND THEIR HYGIENIC CARE.

113. ACCIDENTS.—Hygiene does not solely consist in the prevention of disease; it strives, by all possible means, to lessen the effects of already existing diseases. Hygiene is called upon to act an important part in the avoidance of accidents and in the means for their prompt relief.

114. THE BLOOD.—The blood leaves the heart circulates throughout our whole system, which it nourishes, and returns to the heart; this flow is incessant.

The vessels which distribute the blood in our tissues are called arteries; those by which it returns to the heart, veins.

115. WOUNDS.—When an artery or a vein is cut, the wound is serious.

The blood from a cut artery is of a bright red color and spurts out in jerks.

113. Does hygiene consist solely in the prevention of disease?

114. Describe the circulation of the blood?— What names are given to the blood-vessels?

115. What vessels must be cut to make a wound serious?—How can we recognize that an artery has been cut?

When a vein is wounded, the blood is dark and flows out in a continuous jet.

In bleeding from an artery, pressure should be made with the hand, a handkerchief, a cord, &c., above the wound; that is, between it and the body.

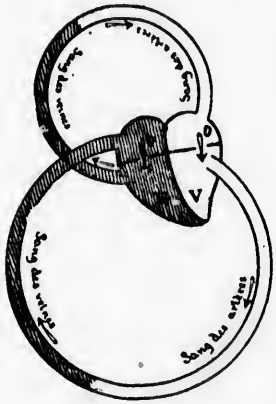


Fig. 21.

The venous blood returns to the right side of the heart, whence it immediately passes into the lungs to be purified by coming in contact with the air; it then enters the left side of the heart; the arterial blood leaves the left heart to be distributed throughout the body.

When the bleeding is caused by a cut vein, the pressure should be made below the wound; that is, on the side farthest from the body.

How can we recognize that a vein has been cut?—How should pressure be applied for a wounded artery?—How should it be made for a wounded vein?

If the wound is on the head, the best means of arresting the bleeding is compression by a piece of lead or other metal, or a coin, applied to the wound and kept in place by a bandage.

Gravity may have a certain influence on the loss of blood; therefore, if it is a limb that has been wounded, it is better to keep it elevated while continuing compression,

(Prompt healing depends greatly upon the clean state of a wound; therefore, all such practices as those of applying tobacco, cobwebs, or any other dirty substance, to fresh cuts should be severely condemned; no foreign bodies should be left or placed in a wound, as they soil and infect it, and delay healing.

The pressure employed to arrest hæmorrhage should be applied directly over the bleeding-vessel, and as near the wound as possible; very often the fingers pressing the edges of the cut are sufficient. Constriction of a limb,—especially af the forearm near the wrist,—with knotted handkerchiefs, cords, &c., requires great caution, to avoid strangulation; badly applied, it does not always stop the bleeding, and, if long continued, may produce mortification.)

(Persons suffering from fractured limbs, or from the effects of other serious accidents (falls, railway accidents &c,,) should have special attention. Great care should be taken in moving them; before so

How can the bleeding be stopped in a wound of the head?—Can gravity exert any influence on bleeding?—What care should be given to wounds?—What should be done for persons suffering from the effects of a serious accident?

doing, it is preferable to gently place the injured person in the most comfortable position possible, surround him with quiet, dismiss curious by-standers, and patiently await the arrival of the surgeon.

Great harm is often done by meddlesome, headstrong persons handling a fractured limb, or superintending the moving about of a person suffering from severe internal injuries. Stimulants, as a rule, should be administered only by the surgeon's orders.)

116. SYNCOPE, OR FAINTING.—Fainting is a temporary loss of consciousness.

Considerable loss of blood, and certain other circumstances, are sometimes accompanied by fainting; the person becomes giddy, and loses consciousness.

Two things should be done during a fainting fit: first, the patient should be immediately placed in an horizontal position; that is, the body should be laid down flat, with the head slightly lower, so as allow the blood to flow to the brain more easily; secondly, the body should be rubbed to reestablish the suspended circulation; the patient should be made to inhale strong perfumes, or odors, (vinegar, burnt feathers, weak hartshorn, &c.,) which are brain and heart-strinnlants; the face and hands should be bathed with cold water, and all clothing loosened.

116. What is a syncope?—When does fainting often occur?—What is the treatment of a fainting fit?

117. BLOOD-STROKE.—Blood-strokes,a name inappropriately and indiscriminately given to epilepsy and apoplexy, should not be confounded with fainting.

In syncope, the face is pale and motionless; during a blood-stroke, on the contrary, the face is distorted and livid, and the lips frothy.

The patient should be laid down, the head on a level with the body or higher than it, but never lower; there should be no impediment to the breathing; neckerchiefs, collars, waistbands, &c., should be loosened.

118. NOSE-BLEED—Hœmorrhage, or bleeding, from the nostrils is of frequent occurrence. When the flow of blood is not too copious, and the person strong and healthy, it is not injurious; if it is persistent, it may generally be checked by exerting pressure with the finger on the side of the nose from which the blood comes; this compression should be made over the spot where the beating of the artery is felt on the ala of the nose. If this does not succeed in a short time and the bleeding is considerable, the physician must be sent for.

(The patient must be kept quiet in a sitting posture as far as possible, avoiding backward and downward movements of the head; cold applied to the nape

117. Are blood-strokes and syncopes the same?—In what do they differ?—What is to be done for the patient suffering from a blood-stroke?

118.—What is a hæmorrhage?—Which is the most ordinary hæmorrhage?—What is to be done in nose-bleed?

of the neck, water dashed in the face, a blister over the liver, holding both arms above the head &c. are simple things that may be tried while awaiting the arrival of the physician.)

119. Poisoning. — Cases of poisoning are frequent.

When any poison has been swallowed, the stomach should be promptly emptied.

Vomiting may be induced by simple means within the reach of every one.

Very salty water causes vomiting; the ingestion of a large quantity of warm water, and tickling the throat with the finger, also promptly produce puking; if warm water cannot be immediately had, it may, in the meantime, be replaced by plenty of cold water. When milk can be procured, a large amount may be given with the water.

The vomiting should be kept up incessantly, or till such times as the water is rejected in the same pure state as it was when swallowed.

The whites of two eggs, beaten up with some water, may be given instead of milk.

Another antidote, especially for poisoning by acids, may be made with a little earth or ashes mixed with water; this turpid liquid may be given freely. Soap-water is also useful.

119.—Is poisoning frequent?—What is to be done in a case of poisoning?—How may vomiting be produced?—Should the vomiting be kept up long?—Can the white of an egg replace milk in poisoning?—Is there another antidote for poisoning by acids?

120. POISONING THROUGH THE SKIN.—Persons who have wounds or scratches on the skin, should be careful not to touch any poisonous substance, as any abrasion exposes to easy absorption.

Those whose occupation obliges them to handle and use poisonous materials in their work should smear their hands with oil, and wash them often in strong salt water.

Anthrax, or malignant carbuncle, is the result of poisoning through the skin.

The disease usually appears on those parts of the body exposed to the air, and begins with a pimple which soon presents a dark spot at its summit. The affection develops rapidly, and ordinary means are powerless; medical aid must be promptly secured.

Anthrax is acquired from infected animals.

121. POISONING BY THE LUNGS.—Many diseases that are contracted by the introduction of disease-germs from the air by breathing may be regarded as cases of poisoning.

Absorption by the lungs is more active when the person is fasting or debilitated; therefore, when in those conditions, one should never visit the sick. (Parag. 16.)

120. Is a wound in the skin dangerous?—What precautions should be taken by persons who handle poisonous materials?—What is anthrax?—How may it be recognized?—How is it acquired?

121. Can certain diseases be regarded as cases of poisoning?—When is exposure most dangerous?

122. BURNS AND SCALDS.—The first precaution to be taken is to protect the burnt surface from the action of the air; this may be accomplished by covering the injured parts with greasy substances, wet cloths, &c.

123. CHILBLAINS.—Chilbains are red patches or swellings generally produced by exposure to cold, and mostly met with in children and weak people

The fingers, toes, and heels, are the parts most usually affected.

As regards prevention, the parts may be strengthened by rubbing them with aromatic substances, wine, camphorated high-wines, salt water, &c.; they should not be washed with warm water, or provided with a covering that retains dampness.

124. FOREIGN BODIES IN CERTAIN CAVITIES: THE NOSE AND EARS.—Whenever a foreign body becomes lodged in one of those cavities, no persistent attempts should be made to extract it: this is a delicate operation which requires the knowledge and skilled hand of the physician.

Many accidents occur from the awkward efforts of extraction made by inexperienced and incompetent persons.

122. What is the first care to be given to a burn or a scald?

123. What are chilblains?—What are the parts usually affected?—What is the preventive treatment of chilblains?

124. What should be done where a foreign body enters the nose or the ear?—What may be injurious in such cases?

RECAPITULATION.

Hygiene does not solely consist in the prevention of disease; it strives to lessen its severity

Accidents become diseases.

The blood-vessels are called arteries and veins.

A wound is more serious when an artery or vein has been wounded.

The bleeding from an artery is not similar to that from a vein. The localization of compression in each of the above circumstances should not be same.

Gravity influences the loss of blood.

Fainting is a loss of consciousness.

The first assistance to be given in syncope is important.

Blood-strokes should be discriminated from syncope.

Hæmorrhage is a loss of blood.

Nose-bleed is not always dangerous.

Poisoning is frequent; the stomach should be emptied by the most prompt and simple means.

Poisoning may sometimes occur through the skin.

Anthrax, often met with in man, is a disease especially acquired from infected animals.

Certain diseases may be considered as the result of poisoning by the lungs.

The sick should not be visited when one's powers of absorption are most active.

A burn must be protected from the air.

Chilblains are usually caused by cold, and require preventive treatment.

Foreign bodies in the nose and ears should be extracted by the physician only.

FOURTEENTH LESSON.

HYGIENE OF THE DWELLING.

The order that binds men together in society obliges them not only to in no way harm, or be prejudicial, to their neighbor, but it requires also that each person keep what he possesses in such a condition as to preclude iujury or damage to any one. (Donat.)

The man that does not observe the laws of hygiene is certainly harmful to society, as he multiplies the causes and the number of diseases; so a whole population may deeply suffer from the culpable neglect of a single individual. The evil thus unwittingly done by man is incalculable, and his responsibility is great.

The hygiene of the person has taught us in the preceding lessons some essential rules, the appreciation of which contributes to each one's well-being and to general comfort; the following lesson will teach us what man should be in his home, how the dwelling, when all the laws of hygiene are applied, must necessarily preserve health, prevent disease and insure the rapid cure of any existing ailment.

What are the duties of men living in society?—To what does the infringement of the laws of hygiene expose?—What is the object of the following lessons?

The working man of to-day fully understands, the greatest bounty he can bestow upon his family and upon himself is a dwelling-house of which he is alone master and proprietor; the efforts actually tend to replace the furnished lodgings and dismal garrets, prison-like, devoid of sunlight, where life rapidly withers and wastes, with the small homely cottage and its healthy interior.

The advice that follows applies especially, then, to the workingman and his humble home; nevertheless, being practical, it may be useful to all. The smallest property-owner, or the most modest of workmen, may faithfully follow those precepts, and place himself on an equal footing with the rich, as regards comfort and health.

125. BUILDING SITES.—The great extent of our country, producing such extreme diversity of soil and climate, does not permit of any absolute rule for the choice of a building site: on the Pacific coast, for instance, a higher ground may be chosen than can be obtained on the shores of the Atlantic. What must be procured is protection from high winds and from variations of temperature: in warm regions, high mountains protect from the heat; in cold districts, the lowlands are more free from cold and strong winds.

In the Province of Quebec, protection must be afforded from the south-west and north-east winds;

What is one of the tendencies of this century?—To whom are the following counsels particularly useful?

125. What should be the site chosen for the construction of a house?—In the Province of Quebec, what care is required?

doors and windows should, therefore, be rarely placed on those sides.

Bed-rooms should be on the east or south side to be protected from the north-east and south-west winds which blow with such violence in severe weather.

In case of illness, if the bed-rooms are not situated as advised above, the patient should occupy the apartment that is least exposed to the wind.

In open country, the proximity of marshes should be avoided; should they exist in the neighborhood, protection from their deleterious emanations should be secured by planting a great number of vigorous trees, with large branches and thick foliage to intercept and absorb the dampness and noisome effluvia.

126. NATURE OF THE SOIL.—Too much care cannot be given to the choice of a dry soil, free from gazeous exhalations; avoiding, for instance, the vicinity of cemeteries.

In cities, the soil is often made up of animal and vegetable refuse and rubbish of all kinds; without perfect drainage, such soil can never become a suitable site for dwelling-houses.

127. THE VICINITY.—The vicinity of a wood is healthy, the air being more moist; a too close proximity, however, is not to be recommended.

Where should bed-rooms be situated?—Where should the patient be placed?—What protection can be afforded against swamps?

126. What should be the nature of the soil?—Are all soils equally healthy?

127. Is the neighborhood of a wood or a river healthy?

The atmosphere in close proximity to rivers is too damp, and the ground, therefore, unsuitable for dwellings; inland soils should be chosen.

The trees should not be too thick around a house; air and light should be allowed to enter abundantly.

Very often, a negligent and imprudent neighbor will poison your ground by the continual percolation of the contents of his drains; you must, therefore, have a thorough knowledge of the surface level and of the natural underground slopes of your land.

Narrow streets, where air and light penetrate with difficulty, are objectionable for dwelling-houses.

The width of a street should be twice the height of the houses; so, the depth of a building lot should be twice the height of the dwelling erected on it.

128. CELLARS.—Every house should be provided with a cellar, or it should be high enough from the ground to allow free circulation of the air beneath it; this ventilation should be assured by ventilators and air-holes constructed so as to be accessible and easily opened.

Cellar-walls should be both air and water-proof. One of the best means of correcting the dampness so often found in cellars, is to dig a trench about a

How should the trees be disposed around a house?—Is it necessary to know the slopes of lands?—Are narrow streets healthy?—What should be the width of a street,—of a building lot?

128, Is a cellar necessary?—How should the walls of a cellar be constructed?

foot in width all around the foundations and replace the earth taken out with lime; this assures the dryness of the walls.

Another method to obviate the dampness in cellars, is to build a second and thinner wall outside of the principal one and three inches away from it, so leaving a vertical air space.

The damp from the cellar rises in the walls by capillary attraction; it is this same attraction that causes the oil to ascend in the lamp-wick. This permeation may be prevented by inserting a layer of damp-proof material between the cellar walls and the upper walls.

The difficulties met with in obtaining perfectly dry basements, teach us that those parts of a house should be inhabited only when it is not possible to do otherwise. The basement should generally be kept for the heating apparatus and the storage of the family provisions. It should be divided up into apartments according to the requirements of the inhabitants of the house; the temperature should be carefully seen to. (The apartment in which the provisions—especially vegetables—are kept should be freely ventilated and scrupulously clean, to avoid infection from the germs of decaying organic matter. Those provision-cellars, especially found in country houses, but also in our cities, are a source of infection that is often overlooked; frequently the adjoining apartment being used as kitchen, dining-room, sitting-room—even bed-room sometimes,—is in-

Does the dampness of the cellar ascend to the upper stories of the house?— How can this dampness be prevented?—Should basements be inhabited?

habited the whole day long, and is in free communication with the germ-producing cellar ; the consequences, when rigorous hygienic precautions are not enforced, are easily surmised.)

It is better to sleep in the open air than to inhabit a house with a damp cellar which is nothing else than a center of infection.

129. Building Materials. Walls and Floors. —If the walls are of brick, they should be built like those of the cellar; that is, they should be double, with a vertical air-space of two or three inches between them. Here and there, bricks placed cross-ways should be inserted to unite the walls and give them greater solidity.

The inside of the walls should be lathed, as in ordinary wooden houses; this covering is indispensable for the prevention of dampness. It is proved that each brick can hold one pound of water ; therefore, if the plaster be applied directly to the bricks, and the brick work be solid, the wall will be constantly damp.

Stone walls, although they absorb less moisture, require the same prudent measures.

The floors should be of hard wood oiled and polished ; carpets may thus be dispensed with, as they are often dirty, and hide unclean floors.

129. How should the walls of a house be built?—Is lathing necessary on brick, and on stone walls?—What should the floors be made of?

RECAPITULATION.

Man should cause no injury to his neighbor either by his actions or his possessions.

A house, as well as an individual, may be prejudicial to health.

Hygienic reform in dwellings strives to replace crowded lodgings, by separate private houses.

In Canada, owing to the diversity of soil and of latitude, there cannot exist a uniform rule for building sites.

In the province of Quebec, protection is needed from the north-east and south-west winds.

In low countries, safety from the influence of neighboring marshes is required.

A soil that has not been thoroughly drained cannot be used for the erection of dwellings thereon.

The atmosphere in the neighborhood of woods and rivers being too damp is not favorable to health.

There should exist reasonable proportions between the width of streets, the depths of building-lots, and the height of the houses.

Cellar walls should be both air-tight and water-proof.

The dampness of the cellar, oftentimes ascends to the upper stories of a dwelling.

Generally speaking, basements should not be inhabited.

Brick and stone walls absorb a great deal of moisture.

Special ways of constructing walls are employed to obviate this dampness.

FIFTEENTH LESSON.

HYGIENE OF DWELLINGS.

(Continued.)

130. DIVISIONS. DIMENSIONS OF THE DIFFERENT APARTMENTS OF A HOUSE. BEDROOMS. KITCHEN.—The apartments in which man spends the greater part of his existence deserve special consideration in the division of a house: man sleeps from eight to nine hours a day; the room where this needful rest is taken should be of the required hygienic dimensions, and should be located on the side of the house that receives most light; that is, on the east or south-east side; care should be taken to avoid exposure to the north, north-east, or south-west, the winds from those points being the strongest and most constant.

It is difficult, without proper ventilation, in a bed-room, to furnish each occupant with the required 3,000 cubic feet of fresh air per hour (Parag. 5).

Some manner of imperceptible ventilation must be employed to effectively renew the air; the chimney-flue will fulfil this requirement, especially if a lamp be placed near the entrance of the flue, to create an uninterrupted ascending current of warm air.

130. Where should the bed-rooms be situated in a dwelling?—What amount of air is requisite for a bed-room and is this amount readily procured?—How should the room be ventilated?

Such ventilation is requisite in all bed-rooms, but is paramount in those of children, whose respiratory functions are so active; children, even more than adults, require pure, invigorating air; that vitiated by respiration cannot give the child who breathes it the healthy physical growth of youth.

Even the greatest hygienic precautions cannot always protect from disease, and man is often condemned to endure the suffering that accompanies it. In this respect, the bed-room deserves special attention, as an ailment will often be shorter and less serious, if this apartment fulfils all the hygienic requirements.

After the bed-room, the kitchen is certainly the apartment requiring the most care; one judges of the cleanliness of a family from the state of the kitchen and not from that of the dining-room or the parlor.

The kitchen floor should be polished or waxed, to facilitate washing. The room should receive plenty of light from two windows on each side.

131. WHEN TO ENTER A NEWLY-BUILT HOUSE.— Dampness and paint are two things to be feared; rheumatism and lead colic are the complaints they expose to.

Is efficient ventilation more necessary in children's rooms?—Does a hygienic bed-room exert any influence on disease?—Should the kitchen receive much hygienic care?

131. What is to be feared from inhabiting a newly built house?

Free airing of the building, in summer, and prolonged heating, in winter, are required previous to its being inhabited.

The following means may be employed to demonstrate that a house is not too damp; that is, that its walls do not contain too much moisture :—

A pound of quick-lime is placed in a vessel, and left in a tight room for twenty-four hours. If, at the end of that time, the weight of the lime has not increased one drachm and a half by the absorption of moisture, the apartment is inhabitable.

The second process, more precise, is as follows :—

The plaster of walls should not normally contain more than 20 or 21 per cent of moisture; while being used in the construction of the walls it absorbs as much as 40 per cent of water; it must be seen to, then, that it does not contain more than 20 or 21 per cent when the house is finished. To ascertain this, plaster is extracted with a gimlet at different points of the wall and from different depths; it is weighed, heated, and weighed again; if the loss of weight is not more than one fifth or one sixth—that is 20 per cent—the dwelling may be occupied.

No closed room should be slept in till the painting is perfectly dry.

How may those accidents be avoided ?—How can it be ascertained that a newly built house is not too damp ? —Is it wise to sleep in freshly painted rooms ?

132. LIGHTING.—Our methods of artificial illumination are one of the principal causes of the vitiation of the air in our dwellings; a common lamp consumes as much oxygen as a man; a gas jet, still more.

Gas should never be burned in bed-rooms; sperm candles or vegetable oils, emitting less carbonic acid, should be used.

Gas produces much heat, and requires the use of a governor, or regulator.

No person should undertake tiresome night-work with defective light, it is so detrimental both to eye-sight and general health.

133. FLOWERS.—It is a bad practice to keep flowers in a bed-room. In the dark, they continually send forth carbonic acid, a noxious gas (Parag. 2); in the light, the green parts emit oxygen. Those important facts should be remembered.

134. ANIMALS.—Animals, birds, &c., like man, exhale carbonic acid during respiration; therefore, they should not remain in sleeping apartments, and the room in which they are kept should have effective means of ventilation.

132. Can the substances used for the artificial lighting of our houses vitiate the air?—How should bed-rooms be lighted?—Is lighting by coal gas hygienic?

133. Does any danger attend the keeping of flowers in sleeping apartments?

134. Should animals be allowed in bed-rooms?

135. HEATING AND VENTILATION. — In cold climates, satisfactory heating and perfect ventilation offer considerable difficulties ; they are, nevertheless, obtainable.

The two most usual systems of heating are by means of wood stoves and coal stoves, or furnaces; chimney-fires, or open grates are not, sufficient to warm our houses, and are useful only as extraction ventilators (Fig. 3.).

Wood stoves may be used in rooms occupied only for a short time, and easily heated.

Coal stoves are the most economical and most hygienic heating apparatus, the heat being more uniform ; but they call for more care than wood stoves

A coal stove should be solid and without cracks or openings through which poisonous gases might escape.

The mica that closes the openings should be kept in order so that the flame may be steady and always drawn towards the chimney.

The gases that arise from the combustion of the coal are, carbonic acid, carbonic oxide, and sulphurous oxides.

135. Can heating and ventilation be accomplished ?—Which are the usual methods of heating ?—Are wood stoves suitable ?—Which is the best system of heating ?—How should coal-stoves be made ?—What precautions are to be taken with regard to the mica ?—What are the gases that the combustion of coal gives rise to ?

Carbonic oxide is poisonous even in small quantities, causing a headache similar to that arising from a tight bandage; in large quantities, it produces unconsciousness and often death.

It is a poison destitute of odor, and kills insidiously during the night; whole families have died from this terrible poison. Before retiring for the night, therefore, one should always see to the dampers with particular care.

The great difficulty in our climate, attendant on heating, is ventilation. People believe it impracticable, because it is not fully tried. To what has been already said on ventilation (Parag. 6, 7, 8, 9), we will add the following:

Ventilation should be carried on as effectually during the winter, as during the summer; every room in the house should be thoroughly aired every day. When the outside temperature is low, the atmosphere of the dwelling must be heated by increased warming; thus, cold and chilliness are avoided. The extra expense entailed for the thorough renovation of the air for a season, is amply compensated for by the benefit one's health derives from the hygienic atmosphere thus furnished.

The greater number of eruptive fevers and epidemic diseases are more disastrous during the winter, because the vitiated air of the dwellings is not purified often enough, and, so, is a suitable pabulum

What is the effect of carbonic oxide?—Has oxide of carbon a smell?—What difficulty is attendant on heating?—How should ventilation be accomplished?—What occurs when ventilation is defective?

for the development of disease germs. The ventilators in the double-windows should be of sufficient size, and the inside window-sashes may be disposed in the manner described in paragraph 21. In every room, there should be an outlet for the easy escape of foul air; this outlet should be at the lower part of the wall on the same side as the inlet, and should communicate with the chimney flue, or with a special ventilating shaft placed near enough to the chimney to be sufficiently heated to produce a continuous extraction current of foul air. Besides those usual easy methods of ventilation, several others are recommended. Figures 21 and 22 show the efficiency of the one we have described.

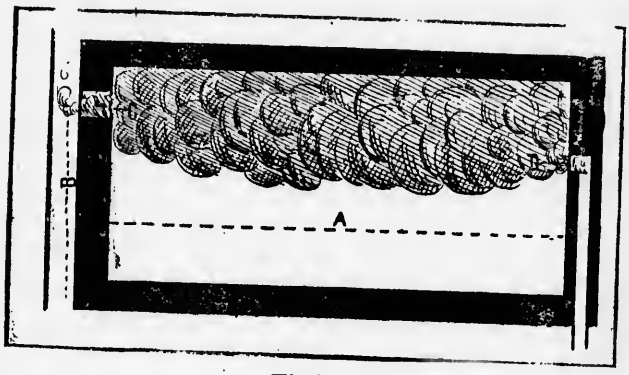


Fig. 22.

The outlet is placed opposite the inlet, so that the air is renewed only in the space above the line of breathing A.

It must be remembered in the building of a house, that the question of ventilation is vital, and that even though the house is destined to protect us

against the inclemency of the weather, it must not deprive us of the pure fresh air that is so requisite to health.

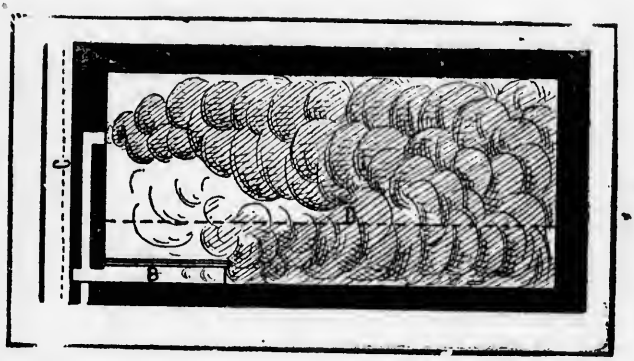


Fig. 23.

The air enters the room by the opening A, spreads out and descends below the breathing-line D, and escapes by the outlet B, communicating with the chimney C.

136. THE TEMPERATURE. — Ventilation should not lower the temperature of a dwelling too much. The temperature should be uniform; the greatest care should be taken to avoid its rising above 20° Centigrade, or 68° Fahrenheit, or descending below 15° C., or 59° Fahr.

In our cold climate, the temperature in our dwellings should not rise above 18° C.; one should avoid and fear the disastrous effects of sudden changes from icy cold to excessive heat.

136. What should be the temperature of a house in our climate?

Should the temperatnre be higher in certain cases?

The rooms where quiet work is done require more heating; persons very sensitive to cold, the weak, invalids, convalescents, and the aged, also need a higher temperature.

It is certain that the breathing of fresh, cool air is better and more invigorating; therefore, the temperature of a bed-room should not be above 15° C., or 50° Fahr.; sleep, with this degree of warmth, is more restorative.

The following is a scale of temperatures to be maintained in the different places and conditions mentioned.

Halls and court rooms	65° Fahr.
Schools	64° to 70°.
Family parlors &c.	70° to 71°.
Diseases (in general)	60°.
Special diseases (eruptive fevers)	55°.

RECAPITULATION.

The bed-room, in which man passes one third of his life to recuperate his strength, deserves special hygienic care.

The ventilation of bed-rooms, especially those of children, should be perfect.

A healthy sleeping apartment avoids many diseases, and helps to lessen the gravity of those already existing.

What should be the temperature of a bed-room?—Of certain other apartments?—during certain diseases?

The apartment next in importance to the bed-room, hygienically, is the kitchen, and it requires proper care.

The effects of dampness and paint are to feared in a newly erected house.

Certains processes may be employed to know if a recently finished house is inhabitable.

It is very imprudent to sleep in a closed room, if the painting is not perfectly dry.

The substances used for lighting our dwellings are one of the important causes of the pollution of the air.

As the combustion of gas deprives the air of a large amount of oxygen, gas light should not be used in bed-rooms.

Flowers and animals vitiate the air by their breathing. Satisfactory systems of heating and ventilation are difficult to obtain in our climates, but, withal, they may be rendered effective.

Wood-stoves are suitable for an apartment that is occupied only for short periods at a time, and that can be rapidly heated.

Coal-stoves are the best heating apparatus, but certain care is required in their use.

Ventilation is necessary especially in winter; if the heat is increased, it can be easily obtained.

For effective ventilation, a special vent-shaft is needed in each room.

The temperature of a dwelling should be uniform and moderate.

Too high a temperature exposes to the accidents that may result from the change from an over-heated apartment to a cold atmosphere.

As cool air is more healthy, the temperature of sleeping apartments should be lower than that of the other rooms.

SIXTEENTH LESSON.

HYGIENE OF DWELLINGS.

(Continued)

137. CLEANLINESS IN AND ABOUT THE HOUSE.—Filthiness and disease may be said to be synonymes.

Dirtiness always breeds disease.

Cleanliness invariably diminishes the mortality.

Typhoid fever, cholera, and other serious disorders, are the result of filthiness; should cleanliness become thorough and universal, they would disappear for ever.

Scripture, that counsels man to help himself, represents cleanliness as a virtue, so essential is it to the preservation of health and life.

Pure air is insufficient, if the whole interior of a dwelling,—floors, walls, furniture, and household utensils,—be not kept perfectly clean.

Sweeping is requisite every morning; when the dust has fallen it should be removed with a damp cloth, and not with a duster which simply displaces it.

137. Are disease and filthiness synonymous?—What does dirtiness breed?—Does cleanness affect the mortality?—What diseases are the result of filthiness?—How does Scripture regard cleanliness?—Is pure air sufficient?—When should sweeping be done?

During an epidemic, the cleaning may be done with a weak solution of carbolic acid.

It must be remembered that the corners of rooms, where the renewal of the air is insufficient, deserve special cleanliness.

The parts of the floors that are not covered with carpet, should be smooth and clean; the carpets should be often shaken.

In communities and religious institutions, where the greatest cleanliness is practised, it is rare to find any other diseases than those resulting from a life of seclusion and penance, although, in these establishments, there are a great number of persons congregated together. This fact should impress upon us the great results that might be obtained, if, in every family, rigorous cleanliness were practised according to the laws of hygiene.

138. CAUSES OF FILTHINESS.—The causes are found more especially in the disposal of the refuse of the house, of the kitchen, of the waste waters and fæces.

Domestic refuse should be burnt daily; it should be stored up only in case it can be removed every day by the scavengers.

Waste waters should be thrown into the sinks; fecal excreta should be received by the sewers.

During an epidemic, how should the cleaning be done in the morning?—Should the cleaning be thorough?—How should the floors be kept?—What does the cleanliness in religious institutions prove?

138. What are the principal filth producing agents?—How should house refuse be treated?—What should be done with the waste-waters and fecal excreta?

No sink or water-closet should be put into any dwelling, even the poorest, without its being provided with a siphon trap having a cleaning aperture hermetically closed but easily opened, to facilitate the cleaning.

This trap being always full of water prevents any foul odor from entering the house.

Notwithstanding this precaution, the sink and water-closet should be kept scrupulously clean and often flushed abundantly with water and some odorless desinfectant solution.

Imperfect and unhealthy soil-pipes, or vessels containing waste-water or any excreta should never be allowed in or near a bed-room.

The waste-pipes from sinks and closets should be furnished with a vertical ventilation pipe which should be carried to a point above the roof, preferably near the chimney and away from the windows; the soil pipe itself also may be continued up through the roof.

The soil-pipes of the house, as far as practicable, should communicate with the street sewer only at one point; the smaller the number of connections with the street sewer, the more perfect is the drainage.

Fæces decompose in twenty-four hours, and then

What sanitary precaution is necessary in sinks and water-closets ?—How does the siphon trap act ?—What other care do sinks and water-closets require ?—Should dirty water or other refuse be left in bed-rooms ?—How should waste-pipes be ventilated ?—How should the house drains be connected with the street sewer ?—Do fæces decompose rapidly ?

emit most dangerous gases. After the daily washing out of the water-closet, by abundantly flushing it with water, the excreta are carried off into the street sewers and the family is protected from their deleterious effects.

As the systems of sink and water-closet drainage are very numerous and increasing, it is useless to describe them; some new arrangement will perhaps shortly be more perfect than the best already in use. Whatever the system, its parts should be easily accessible to inspect and to clean; the custom of covering in and hiding those apparatus should be discouraged.

The ventilation of the drain leading to the main sewer should be done in the same way as that of soil-pipes.

139, DRY EARTH CLOSETS.—In the country, and elswhere if there are no sewers, the dry earth closet is the best means that can be adopted for the disposal of fæces. When the soil is dry and well drained, this system is in many ways superior to water-closets.

It consists in employing boxes or drawers lined with galvanized iron and placed under the privy seat. After each stool at least a pound of dry earth is thrown into the box. The best kinds of earth are wood or coal ashes, chalk, or dry common earth; sand, gravel, and even chalk, are unsuitable.

How should sinks and water-closets be constructed?—How should the drain-pipe be ventilated?

139. Which is the best system of privies where there are no sewers?—What is the dry earth closet?

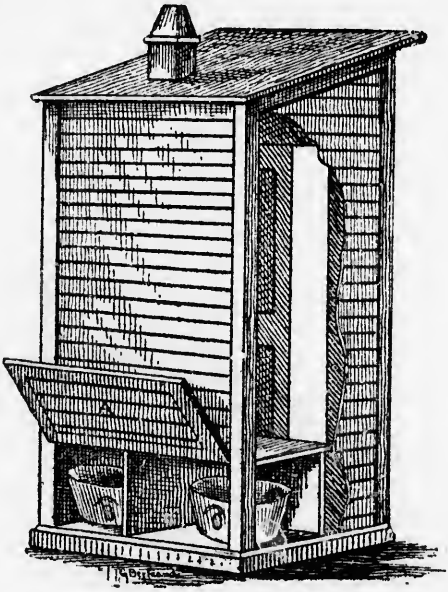


Fig. 24.

Dry earth closets. American system.

It is highly important that these substances be dry, or fermentation will result, and the presence of the excreta will become rapidly injurious to health.

When all the required precautions have been taken, the removal of the contents of the boxes becomes necessary once a month for a family of

Is it important that the earth used should be dry?—Should the contents of the boxes be removed often?

six. Their contents are odorless and may be used as manure.

This system, during an epidemic should receive the same sanitary care as that given to water-closets. The desinfectants mentioned and recommended in the supplement (chapter 4.) should be used abundantly.

Fig. 25.

Dry earth closets. Rochdale system.

During an epidemic, what care should be given to these closets ?

If a great number of persons use the same closet, a larger pit will have to be dug under the seat; but, like all other privy-pits it should be so arranged as to prevent percolation of the liquid filth into the neighboring soil,

Open, uncemented privies allowing easy air-pollution and contamination of the surrounding soils, are the cause of countless diseases and of loss of life; more so even than all the scourges that have ravaged mankind. They should be frequently emptied. They should not be filled in with earth and closed; this pernicious custom of closing in the privy pits when full transforms the neighboring ground into a filthy, infectious soil. (By-Laws of the Board of Health).

Cleanliness around the house is as edful as that of the house itself. It cannot be too often repeated that everything must be kept in the cleanest state. A filthy yard contaminates the water, fouls the air, pollutes everything; no rotting vegetable matter should lie about, no stagnant pools should be left, no refuse or waste-water from the house should be thrown into it; a clean, tidy yard is a safe guard against the invasion of many diseases that might otherwise penetrate to the house and bring care and mourning to its occupants.

When a large number of persons use those privies, are the boxes sufficient?

Are uncemented privies dangerous? — Is cleanliness required around the house?

140. WELLS.—The digging of wells has already been spoken of; but the question is so important that it will bear repetition.

The surface of the ground should be attentively examined, so as to place the well at the highest point; as far as possible, the interior of the well should be cemented to a great depth so that no polluting liquids from the surface or neighboring soil may find their way into the wall.

The well should be isolated, that is situated away from buildings of any kind, &c.: it should always be kept well covered over, to avoid the entrance of foul air and foreign matter.

A well from which water is drawn for cows should never be situated under the floor of a stable, neither should it be at a shorter distance than forty feet from any stable or pig-sty, heap of manure or refuse, unless it be an artesian or tube well (By-laws of the Board of Health).

141. THE BATH-ROOM.—In every house, there should be an apartment containing a bath, the cost of the fitting up of such a room being moderate. The custom of taking the morning wash, in common, we may say, hinders thorough details of cleanliness, and the ablution is not perfect; in a bath-room, there is no such hindrance to a complete toilet, and this act of cleanliness cannot be repeated too often.

140. How should wells be dug?—What precautions should be taken with regard to wells that supply the cows and the other animals with water?

141. Is a bath-room necessary?

Even in houses where there is no water supply, as in localities without reservoirs, or system of distribution, a bath-room may easily be made, and it should never be left out in the building of a house.

The waste-pipe from the bath, as well as the one from the sink, should not connect with the soil-pipe from the water-closet; each should be distinct, and provided with separate ventilation.

SYNOPSIS

Filthiness and disease may be said to be synonymous, since many diseases originate from uncleanliness.

Cleaning is required every morning, and more urgently during an epidemic.

Religious institutions afford us striking examples of the good resulting from cleanliness.

Causes of filthiness are found in the disposal of house-hold refuse waste-waters and fecal excreta.

Dry refuse should be burnt.

Waste-waters should be thrown into the sinks and drains.

The sinks and water-closets should all be furnished with siphon traps.

In localities when there is no aqueduct or reservoir, should bath-rooms exist?—Should the waste-pipe from the bath connect with that of the water-closet?

The soil-pipes and drain-pipes should be provided with special ventilation.

As far as practicable, the house-drains should have but one connecting point with the street sewer.

The divers systems of sinks and water-closets should be easy to inspect and clean.

In the country, and elsewhere if there are no sewers, the ash-closet, or dry earth privy, is the best.

It should be cleaned out once a month.

During an epidemic, the dry earth closet requires the same disinfection as the water-closet.

The privy pits should be cemented and impervious.

A privy pit should never be abandoned, or closed up, before having been emptied.

Cleanliness around the house is as requisite as that of the inside of the house.

The well should be dug in a special spot; it should be steined and cemented to a reasonable depth, to prevent percolation of liquid filth from neighboring soils.

A bath-room should be found in every dwelling.

The waste-pipe from the bath and sink should not connect with that of the water-closet.

Even in districts where there is no system of water distribution, the bath-room should exist.

SEVENTEENTH LESSON.

MORAL HYGIENE, OR HYGIENE OF THE SOUL.

142. INFLUENCE OF THE SOUL UPON THE BODY,—The influence of the soul on the body, on the preservation of health, and on the prevention and relief of disease is too strong to be neglected: in this last chapter of a few pages, we shall consider this forgotten subject.

Undoubtedly, this influence is mutual: if the soul can command the body, the latter, on the other hand, exercises over the soul an authority that cannot easily be repudiated, but which in no way lessens the soul's power, for this always continues to exist.

The person who, from childhood, learns to rely on the soul's assistance, and who demands from its energy all the help it can give, may hope to live long and happily. History abounds with examples that shew how easily a human being physically feeble, but supported by an energetic will, can resist disease.

143. FORMATION OF THE SOUL.—Man formed of a little earth, lay inert like a statue before the artist, when the majesty of God bent over him

142. Has the soul much influence on the body?—Is the influence mutual?—Can the assistance of the soul act upon health?

143. How was the soul created?

" and blew unto his face the breath of life; and man became a living soul."

144. SOUL AND BRAIN.—Man is all soul. The soul is not a part of the body, as certain persons pretend; neither is it a dependency of the brain, as others believe; no, the soul rules our body, and the brain, instead of governing it, is submissive to it.

The soul employs our brain to communicate to us the intelligence we possess; it is through the brain that our intellectual faculties develop.

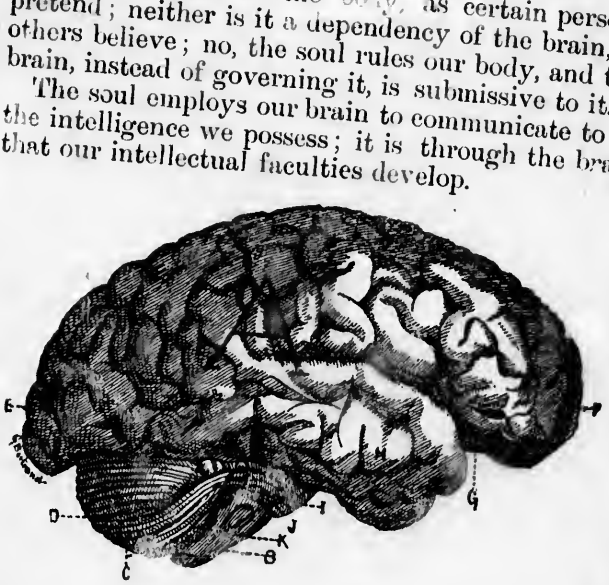


Fig. 26.—The brain.

145. SITUATION OF THE BRAIN.—The brain is placed in the front and upper part of the skull; the back part is occupied by the cerebellum, or little brain, an organ presiding over motion, and which with its prolongation inf[illegible]ord gives issue to the nerves.

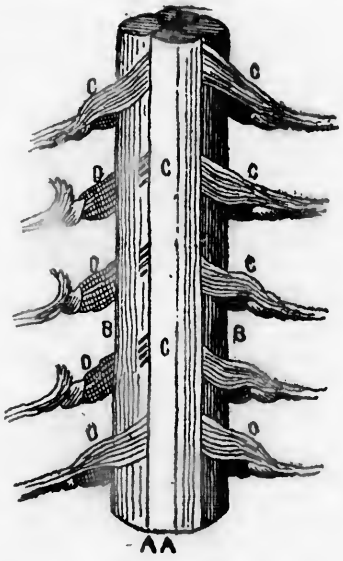
144. Is the brain the organ of the soul?—What is the use of the brain?

145. Where is the brain situated?

146. THE NERVES.—The nerves of the marrow spring from it by two roots; one, the anterior, transmits motion; the other posterior, sensibility.

Thus, there are two nerve currents: one, posterior, by which the brain receives impressions; the other, anterior, by which the power of motion is given to the organs of locomotion. The posterior nerves are called sensory nerves, and the anterior ones, motor.

Those details will help to understand the intellectual phenomena that we are about to study.



Fig, 27.—The spinal cord.

D, anterior root, Ci, posteror root.

146. Where do the nerves issue from?— Are there several nerve currents?

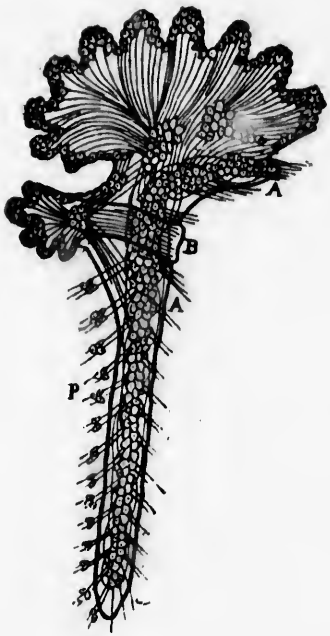


Fig. 28.

Half of the brain (A), of the cerebellum (B), and of the spinal cord (P).

147. INTELLECTUAL FACULTIES. — The intellectual faculties and that breath of God, called the soul, which gave life to the body of the first man, form but one; without the soul, animal life alone would have been given, and man would have been nothing else than a particular species of beast among the numberless ones that people the earth.

147. Are the intellectual faculties and the soul united?

The principal qualities around which all the others group themselves, with their various degress of perfection, are the imagination, the will, and reason. It is on those that is grafted the whole character of man: they are its essential parts, and on the manner of formation, of development, and of training of those qualities, depends the character and temper of each and every person.

It is not required to know here what those three faculties—imagination, will, and reason, those distinctive signs of the royalty of man, which extend and exert power over all surrounding nature—are in themselves. But, what is necessary to know, is the important and constant part those faculties play in all our being, and how all our acts are submissive to them. Being familiar with this knowledge, our health will, doubtless, be surprisingly benefited.

148. THE IMAGINATION. — The imagination is that marvellous faculty possessed by our intelligence of receiving the impressions of outside objects: it is the image-making power of existant and non-existant things; it is the echo of all that transpires in our being. Left to itself, it might mislead us, but, guided by reason, it provides man with physical well-being, and moral and intellectual satisfaction.

Imagination is the intellectual faculty that develops the first; it is the predominating faculty in children.

Which are the principal intellectual faculties?—What is treated of in this lesson?

148. What is the imagination?

The greater part of the harms that befalls us is due to the misgnidings of imagination.

Jealousy produces marasmus in children.

Anger and grief cause many sudden deaths.

Nearly all mental diseases alter the composition of the blood.

Imagination contributes greatly to exaggeration in all sentiments.

To become familiar early with the knowledge of this influence of imagination, is to learn to combat and resist it.

Imagination acts directly on health; how many persons with imaginary ills does not the physician see every day?

The first persons to become the victims of an epidemic are generally those frightened long before hand. The physician, the clergyman, the nurse, and the sister of charity have in their tranquillity of mind, a protection generally effective, although they be continually exposed to contagion.

Therefore, *if imagination be so potent for evil, must it not be the same for good? If, after believing myself ill, I really become so, may I not, on the other hands, preserve my health by the firm thought that I am really well?*

When does imagination appear? How can we sometimes explain the evil that befalls us?—Is jealousy injurious to health?—Can anger and grief produce accidents?—Are mental diseases injurious to general health?—Is it important to have a knowledge of the evil influence of imagination? Has imagination a direct action on health?—If imagination is so potent for evil, what may it be for good?

149. THE WILL.—It is by this faculty, whose power we cannot measure, that the misguidings of imagination are over-ruled.

Every day we see mediocres, or persons of inferior talents, in schools, attain high positions, and develop real merit : the will has been the instrument of their success.

The will may be defined, as, above all others, the practical quality of man.

All efforts, from youth, should be directed towards strengthening this faculty, which exists in every one, and which a prudent training may develop surprisingly.

It is as easy to learn "*to will*," as to remain always hesitant and impotent; indecision is truly a disease of the soul that paralizes all the bodily forces.

The most miserable state that a man can be in, is that of having no will.

150. REASON.—If the will helps the imagination, reason should be the true guide of the will.

Reason is the light of man; without it he is in darkness. Reason may be strengthened by the study of what is good and true.

149. Has the will any influence on the imagination ?—How can the will be defined ?—Is it important to cultivate this faculty ?—Is it easy to learn "to will" ?—What is the most pitiable state of man ?

150. What should be the guide of the will ?—How should reason be strengthened ?

151. GOOD AND EVIL.—We have in our being, sources of good and evil.

Now, the soul tells us that good arises from the search of what is right, and the avoidance of what it believes to be wrong.

Good lies especially in activity, in incessant work; labor, instead of being a fatigue, carries with it its rewards: the man who has labored is always contented.

Idleness is the principal cause of the appearance of evil.

Goodness resides in the love of our home, of our friends and of God. God, one's neighbor, and one's self—those three words cover the life of man; they show all his duties and obligations and all his rights, for the fulfilment of a duty carries with it the obtainment of a right, and the right, here, is the happiness which is the reward of him who fulfils his mission with regard to those three duties mentioned.

152. TRUTH.—Man thirsts for truth; he who has received divine truth on his mother's lap should guard and strengthen it; he to whom it has not been taught should seek it.

153. THE PASSIONS.—The passions are strong inclinations towards good or towards evil.

151. Where is the source of good?— Where should we seek goodness?—Where is good found?—Where is evil found?—Where does goodness originate?

152. Should truth be sought?

153. What is understood by the passions?

Passions are not under the control of the body, and are not such that reason cannot repudiate them.

Reason will always succed in giving a right direction to the passions; by reason, is here understood, that reason which God enlightens and without whom it is naught.

154. DRUNKENNESS.—It is the plague of society, the ruin of families, and the destruction of the most robust health.

The analysis we have given of even the most inoffensive liquors in appearence proves that health cannot exist with the use of liquor. (Par. 48.)

Drunkenness does not destroy man physically only, but also morally.

It completely transforms a temper: goodness is changed to wickedness; energy, to indifference, indecision, and intellectual decrepitude; tenderness and sympathy become harshness and brutality; the most noble sentiments, corrupt and degraded.

155. DEBAUCHERY. — It is the companion of drunkenness.

Debauchery often precedes the other passions.

Debauchery has its source in carnal pleasures; like drunkenness it is the ruin of man. Those pas-

Are the passions under the control of the body?—How can the passions be controled?

154. What is drunkenness?—What does the ancelysis of liquor prove?—Has drunkenness an injurious effect morally?—What is its effect on temper?

155. What is debaucherq:—Does precede other passions?—Where has debauchery its iource?—What are its effects?

sions together carry off more victims than all the scourges that ravage mankind.

156. ANGER,—Anger is a strong passion during which man loses all command over himself.

Anger is always a bad adviser and leaves man at the mercy of his adversary.

An angry man is a man who is disarmed, that is powerless; there is a passing increase of force, quickly followed by profound depression.

Anger causes strangulation, for under its influence the vessels of the neck become distended, circulation is impeded, and death may supervene suddenly.

157. SADNESS.—Sadness it a state that depresses the soul and deprives it of all energy.

The antidote to sadness is to be found in amusements and in intellectual and physical labor which purify and invigorate the body, as the sunbeams enliven a dwelling and render it wholesome.

It must be remembered that sadness, like suffering, must be met with on the path of man through life, for a dark cloud may be found on the clearest sky.

Pain and joy are inseparable, but the former should be but as a seasoning to the latter.

156.—What is anger ?—Is anger a good counsellor ?—What does an angry person become ?—What are the effects of anger ?

157.— What is sadness ?— What is the antidote to sadness ?— Is sadness inseperable from man ?— How should joy and sadness be considered ?

Pain and suffering, accepted courageously, modify the temper, as they cause reflection, and elevation of the soul toward its Creator.

As we here understand it, sadness should never be a cause of suffering to man ; by it, he should strengthen his soul, as he might his body by a refreshing repose.

Ordinary sadness should be resisted because it dulls all the important vital functions, and leads to discouragement and disgust, which are nothing else than a slow but sure suicide.

558. HOPE.—The patient devoid of hope will never be cured, the man without hope cannot live.

Life is a twilight : a mixture of darkness and light ; the man who cannot discern the beaming rays of the dawn, is a miserable being.

The man who hopes is strong ; he is ready for every effort.

If the soul is to exert a happy influence on the body is most be ever hopeful.

SYNOPSIS

The soul possesses a powerful influence on the body.

The soul and the intellectual faculties are but one.

What is the effect of sadness accepted with resignation ?—Is ordinary sadness to be resisted ?

158. Is hope necessary to the heart of man ?—What is life ?—Is the hopeful man strong ?—What must be done for the soul to exert a salutary influence on the body ?

The principal intellectual faculties are the ima
gination, the will, and reason.

Imagination, exaggerating all our sentiments, i
the principal cause of our suffering and evil.

By giving, through the action of the will, a wis
direction to our imagination its influence may b
made most useful to man.

Reason should be the guide of the will; reaso
should be strengthened by the study of what i
good and true.

Enlightened reason will keep the passions i
the right way.

Drunkenness is the plague of society, and th
ruin of the most robust health.

Anger and sadness mislead man and disarm hi
in adversity.

Hope is the supreme consolation of man.

TABLE OF CONTENTS.

FOURTH LESSON.

Principal contagious diseases.

FIFTH LESSON.

Alimentary hygiene.—Principal food substances from the animal kingdom.

SIXTH LESSON.

(Continuation.)

SEVENTH LESSON.

Principal foods from the vegetable kingdom.

EIGHTH LESSON.

Principal foods from the mineral kingdom.

NINTH LESSON.

Hygiene of the digestion.

TENTH LESSON.

Hygiene of the person.

ELEVENTH LESSON.

School hygiene (*Continued*).

TWELFTH LESSON.

Care of the body.

THIRTEENTH LESSON.

Accidents and their hygienic care.

FOURTEENTH LESSON.

Hygiene of the dwelling.

FIFTEENTH LESSON.

Hygiene of the dwelling.

(Continued.)

SIXTEENTH LESSON,

(Continuation.)

SEVENTEENTH LESSON.

Moral hygiene, or hygiene of the soul.