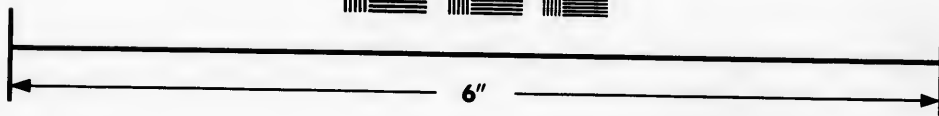
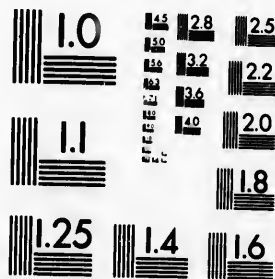


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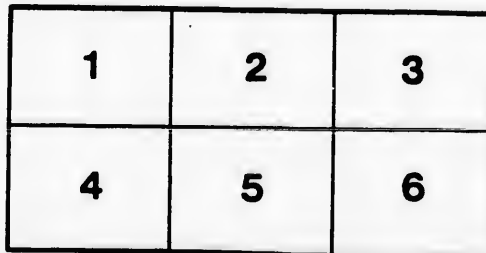
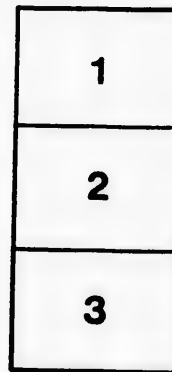
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**ROBERTSON'S CHEAP SERIES.**

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**POPULAR READING AT POPULAR PRICES.**

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**HOW TO ACQUIRE  
HEALTH, STRENGTH, AND MUSCLE.**

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**COMPLETE.**

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TORONTO:  
J. ROSS ROBERTSON, 55 KING-STREET WEST,  
SOUTH-WEST CORNER OF BAY-STREET.  
1879

# HOW TO AVOID THE HEAVY BURDEN OF DEBT

The first step in avoiding the heavy burden of debt is to understand the nature of the debt itself. It is not enough to know that you are in debt; you must know why you are in debt and how you can avoid it. The first step is to stop borrowing money. If you are already in debt, stop borrowing more money. If you are not yet in debt, do not start. The second step is to stop spending money. If you are already in debt, stop spending more money. If you are not yet in debt, do not start. The third step is to stop paying interest. If you are already in debt, stop paying interest. If you are not yet in debt, do not start. The fourth step is to stop paying principal. If you are already in debt, stop paying principal. If you are not yet in debt, do not start. The fifth step is to stop paying taxes. If you are already in debt, stop paying taxes. If you are not yet in debt, do not start. The sixth step is to stop paying other expenses. If you are already in debt, stop paying other expenses. If you are not yet in debt, do not start. The seventh step is to stop paying anything. If you are already in debt, stop paying anything. If you are not yet in debt, do not start. The eighth step is to stop doing anything. If you are already in debt, stop doing anything. If you are not yet in debt, do not start. The ninth step is to stop being anything. If you are already in debt, stop being anything. If you are not yet in debt, do not start. The tenth step is to stop being anything. If you are already in debt, stop being anything. If you are not yet in debt, do not start.

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# HOW TO ACQUIRE HEALTH, STRENGTH, & MUSCLE

## INTRODUCTORY REMARKS.

### TO HEALTH.

What are the miser's splendid hoards of wealth  
To thee, thou greatest, best of blessings—health:  
Not all his riches give the wretch the power  
To buy thy presence for one single hour!  
Tho' when on sick bed laid and rack'd with pain  
He'd freely give them all to woo thee back  
again.

And yet how truly has the poet said:  
'Thy value ne'er is known till thou art fled;  
But when once lost, we then too keenly know  
The virtue which, when ours, possession could  
not show.'

From the days of Hippocrates down to the present, health has always been dilated upon as, perhaps, no other single subject; and yet it is always fresh and interesting. Within the past half-century, and particularly during the last twenty-five years, more attention has been given to health by those whose avocations had a tendency to impair it than in former days. Prior to that time, college races, public gymnasiums, and athletic clubs in this country were not only unknown, but unheard of. It was a bold stroke when Yale College turned its attention to rowing, in the face of great opposition lest muscle should obtain ascendancy over brain, as some of the more orthodox appeared to think, or professed to do so. The Rev. Dr. Theodore Cuyler, even in those primitive times, hailed the first boating club with delight, endorsing the same with voice and pen, and prophesied that our colleges would soon be able to turn out something better than a lot of lean, lank dyspeptics, crammed with learning, but destitute of muscular development. He has lived to see college crews the admiration and boast of the civilized world, and nowhere more popular or more general than in the United States. This was accomplished in less than twenty years—as during our civil war patriotism loomed over and above all other considerations, putting a temporary check upon growing and other athletic exercises. Now the Bar, the Faculty, and even the Clergy patronize and participate in rowing,

with incalculable benefit to body and brain. There are three American gentlemen whose names will always be honoured for their persistent efforts in the cause of health, strength and muscle, viz: Dr. Hall, of *Hall's Journal of Health*; Dr. Winship, the strong man of Boston, Mass.; and Frank Queen, editor and proprietor of *The New York Clipper*. It is our belief that their influence and teachings founded and fostered athletics in America, from college boating to baseball—certain it is the former did not exist here before Mr. Queen's paper was launched. The Germans first introduced the gymnasium here, and they still hold their own, for a 'Turn Halle' is now as much of a necessity with them as their national beverage, lager beer. This may be traced back forty years or more, but the Turners paid little attention to rowing, and none at all to baseball and most other outdoor exercises. To-day scarcely a village is without its gymnasium, and on a much more liberal scale, the attendants practising any exercises they have an inclination for. Christian Associations, as well as the police, now look upon this means as part of their education. Dealers in apparatus have made and are still making fortunes all over the States, while doctors, druggists and undertakers complain of failing business in comparison.

The manifold accidents to which we are continually exposed, the sudden changes of temperature, and the precarious hold we have of whatever is external point to the necessity of having the body formed, by an early and prudent culture, to undergo hardship and fatigue, and to stand prepared at any moment to combat the dangers, difficulties, ills and misfortunes which fall to the lot of every man. The majority of those diseases which afflict humanity would be unknown were children taught the importance of gymnastic exercises, and accustomed to harden their bodies to the intemperance of the seasons, climates and elements; to hunger, thirst and fatigue. Nothing is better adapted to draw out and invigorate the physical powers than athletic games.

The results of a muscular education, and

the advantages of plenty of out-door work, are sound sleep, a good appetite, excellent digestion, a clear head, and the power to undergo almost any amount of fatigue. Winter's cold or summer's heat possess no fears for athletes, and statistics show that insanity seldom if ever happens to this class, who are better able to stand reverses, adversity and sorrow. A good pair of lungs, a sound chest, and a muscular arm command admiration everywhere; even the fair sex have an eye in this direction when looking for a mate. Not only do they not despise nerve, but follow it up with practice, as the number of female gymnasts, trapeze performers, tight-rope artists, velocipede riders, club-swingers, boat-rows, pedestrians, devotees of archery, rifle and pistol shooters, mountaineers, swimmers, etc., will testify; and those who practise and follow these pastimes are, as a rule, refined and cultured. Did this work warrant, names would be given; but the fact is there all the same, with no necessity for doing so. What a weak-voiced man says has nothing of the weight which follows the stentorian-lunged speaker, although the former may be far ahead of the latter in intellect. It is said Lord Palmerston always could overwhelm Lord John Russell precisely in this manner, although the latter was far superior to the former metaphysically. Such people are bound to be heard and felt in the world—on the other hand, a broken-voiced, hollow-chested, weak armed individual is imposed upon, if not actually despised. All such should think of the noted English Earl, in the war between the Red and White Roses, who is accredited with killing one hundred and fifty men in battle with his lance, and escaping without a mortal wound; while his rival, the Earl of Warwick, when cornered and single-handed, slew seven men before he himself was killed. Other instances of remarkable feats will be found elsewhere.

In the course of a long career as a sporting journalist, we have witnessed sufficient to prove all that is contended for muscle and strength; were there no other proofs extant. When men can run at top speed for ten miles, pull a boat for five miles, as if for life or death, engage in a pugilistic encounter of two and sometimes three hours' duration, or play baseball for two hours—when such feats as these can be performed with the sun averaging 120 deg. Fahrenheit, and no particular evil effects follow from the terrific heat, all arguments against muscle fall to the ground, as we have seen men do when mere spectators of these contests. Should a man living an irregular life attempt either, we wouldn't answer for his life forty-eight hours.

Those who go out of their way to find material for refuting the system of gaining muscle contend that athletes, especially pugilists, are not long-lived. Where this is not the case, in nine instances out of ten the parties bring it on themselves by dissipation, irregular habits, and excesses of various kinds. Hereditary disease or accidents carry off some, but to debauchery may be traced most cases of early death. When once trained so that no feat is considered impossible, it requires but little effort to keep in the same condition. Once have the name of not drinking, and you will see the so-called 'good fellows' too weak-minded to refuse, pass away one by one, till you 'stand alone in your glory,' and 'know how sublime a thing it is to suffer and be strong.' Those who do not dissipate to excess, if at all, live out their three-score-and-ten, and remain 'compos mentis' till the last. James Ward, the great English pugilist, although born in 1800, retains all his faculties and much of his physique; William Tovee is going on for seventy-six, and can walk, run, box and argue as well as ever, apparently; Joseph Winrow, now over sixty-five, is equal to ten miles a day, with good sight, hearing, lungs, and 'level-headed.' George Dietz, aged seventy-nine, preferred walking from New Albany, Ind., to the Centennial to riding in the cars, claiming to have made the distance (800 miles) in thirty days; he is also accredited with having walked 404 miles at Fairmount Park, April 26, 1877. John Sheffield, when over half a century, could go through his half-hour feat, viz: 1st, hop fifty yards; 2nd, walk backwards half a mile; 3rd, run half a mile; 4th, leap over ten hurdles, ten yards apart; 5th, walk half a mile; 6th, throw twenty half hundred weights over the head; 7th, pick up fifteen eggs with the mouth, placed in a straight line one yard apart, and bring each one separately back to the bag without using the hands; 8th, trundle a carriage wheel half a mile; 9th, pick up twenty stones, placed one yard apart in a straight line, and return each to the starting-point.

It is a little strange that what everybody appears to know and understand should not be acted upon in the way of health. We are all aware that open-air exercise, whether active or passive, gives tone and vigour, and the more we have the better we are. The writer has had an experience of fourteen years amongst the doctors for an affection of the optic nerve and retina, during which time between sixty and seventy of the leading oculists were consulted (including resident surgeons in New York, Boston, Philadelphia, Baltimore, San Fran-

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disco, Montreal, and London, Liverpool, Dublin, Paris, and Berlin), not one of whom could effect a cure; or partial cure; or, in fact, do anything. Constitutional treatment effected more than all else—regularity, abstinence, electricity, diet, and air were the agents, although it cost a small fortune before arriving at this simple conclusion. One of the greatest fortunes was accumulated by a physician who gave advice and medicine for a shilling—his advice was exercise, and his medicine a tonic. Everybody got better, and everybody consulted with him. It was the custom of a very noted Scotch oculist to send his patients a mile or more to drink from a certain spring having no more virtue than our Croton—in this way he got them to exercise out of doors, and the result was increase of appetite, better sleep, and more strength. The rest was comparatively easy to him, and he soon effected what appeared wonderful cures. People inclined to or already having consumption, when taken from a sedentary life and being employed out of doors, get strong and hearty almost imperceptibly—as said before, you cannot have too much of it. When the weather is inadmissible, procure a pair of 5 or 6 lb. wrought-iron dumb-bells and use them anyway you like—they can be had for less than a dollar. Do not wait till it is the fashion to use dumb-bells or Indian clubs; it may be too late then. The secret of health, which is the equable and complete circulation of the fluids, may be summed up in these few words: moderation in eating and drinking; short hours of labor and study; regularity in exercise; recreation and rest; cleanliness; equanimity of temper, and equality of temperature.

#### COURSE TO BE PURSUED.

The wise who would this life enjoy  
Much time in exercise employ;  
Neglect of this brings on most ills—  
Too soon, alas! each graveyard fills.  
Man's age should be three score and ten;  
Live out your time like honest men;  
Hereditary ill and accident  
Are things we cannot well prevent;  
Transgressions should be kept at bay,  
For with a will there is a way.

'All breaches of the laws of health are physical sins.'

You should exercise gymnastically about a half-hour daily, or an hour once in two days; and in a place free from dust, and which has been thoroughly sunned and ventilated; and midway between one meal and another, rather than immediately before or after one;

and successively but briefly with several instruments, rather than protractedly with one of them—preferring to perform on any exercising occasion many feats once rather than one feat many times repeated; and with the dress loose and easy, the waist free from pressure, and the arms and neck exposed; and most of the time with the mouth closed, head up, chest out, and shoulders down; and with a view to harmonious development, and with the determination of becoming remarkably strong; and without exhausting yourselves, or even wearing or ever imperiling life or safety.

Sleep above the earth not less than fifteen feet, and higher if possible, other things being equal; and above the floor of your apartment not less than two feet; and in an apartment so situated and contrived that the sun and outer air may freely and abundantly enter from at least one direction, but, if possible from more than one; and in an apartment, too, which has been freshly painted, and whose walls are not graced, or rather disgraced, with arsenical paper hangings; and on a moderately hard mattress rather than a feather bed; and under a blanket rather than a comforter; and until you feel completely rested and refreshed, and with the face uncovered, and the head a little elevated, but not much so, and the mouth closed (unless you are obliged to keep it open); and, finally, what is of paramount importance, sleep in a moderate draught of the outer air, provided, however, you shall first render this a harmless custom by its very gradual adoption.

Practise general ablation as often as once a week, but rarely more often than twice a week in cold weather, or three times a week in warm, taking care never to bathe in an inside painted bath-tub or in an unventilated apartment, or for a longer time than ten minutes.

Cleanse the mouth invariably after each meal, and just before retiring at night, using for the purpose a stiff brush moistened with white or Castile soap and water, and then rinsing the month several times with pure fresh water. In this practice guard against two things—injury to the teeth from too much brushing, or to the teeth, gums, and mouth generally, from too long contact of the soap. This substance, properly applied, has all the advantages, with none of the serious objections, which belong to salt or camphor or charcoal.

The teeth may be easily and safely freed from discolouration by patiently rubbing them once a month or six weeks, but not oftener, with the end of a little hard, wooden stick, previously dipped in a composition of

## HOW TO ACQUIRE HEALTH, STRENGTH, AND MUSCLE.

sweet-oil and powdered, unadulterated myrrh or orris-root. Never pick the teeth with a metallic substance.

Wear clothing that shall be porous, unpoisonous, and loose in every particular, especially about the joints; and wear so little clothing about the neck that, if at any time it be omitted altogether, you will not be liable to take cold; and wear not any article at night that you wore during the day.

Expose yourself to the direct rays of the sun not less than six hours a day on an average throughout the year.

### TWELVE WAYS OF DESTROYING HEALTH.

1. Wearing thin shoes and cotton stockings upon damp nights, and in cool, rainy weather. Wearing insufficient clothing, and especially upon the limbs and extremities.

2. Leading a life of enfeebling, stupid laziness, and keeping the mind in an unnatural state of excitement by reading romances. Going to theatres, parties and balls, in all sorts of weather, in the thinnest possible dress. Dancing till in a complete perspiration, and then going home without sufficient over-garments through the cold damp air.

3. Sleeping in feather beds, in seven-by-nine bed-rooms, without ventilation at the top of the windows, and especially with two or more persons in the same unventilated bed-room.

4. Surfeiting on hot and very stimulating dinners. Eating in a hurry, without half masticating your food, and eating heartily before going to bed every night, when the mind and body are exhausted by the toils of the day and excitement of the evening.

5. Beginning, in childhood, on tea and coffee, and going from one step to another through chewing and smoking tobacco, and drinking intoxicating liquors; by personal abuse, and physical and mental excesses of every description.

6. Marrying in haste and getting an uncongenial companion, and living the remainder of life in mental dissatisfaction. Cultivating jealousies and domestic broils, and being always in a mental ferment.

7. Keeping children quiet by giving them paregoric and cordials, by teaching them to suck candy, and by supplying them with raisins, nuts, and rich cake. When they are sick, by giving mercury, tartar emetic, and arsenic, under the mistaken notions that they are medicines and not irritant poisons.

8. Allow the love of gain to absorb our

minds, so as to leave no time to attend to our health. Following an unhealthy occupation because money can be made by it.

3. Tempting the appetite with bitters and niceties, when the stomach says No, and by forcing food when nature does not demand, and even rejects it. Gormandizing between meals.

10. Contriving to keep in a continual worry about something or nothing. Giving way to fits of anger.

11. Being irregular in all our habits of sleeping and eating, going to bed at midnight and getting up at noon. Eating too much, too many kinds of food, and that which is too highly-seasoned.

12. Neglecting to take proper care of ourselves, and not applying early for medical advice when disease first appears. Taking celebrated quack medicines to a degree of making a drug-shop of the body.

### USEFUL SCRAPES OF INFORMATION.

Lying or sitting down on the grass or bare earth for a moment is dangerous, rather use your hat; a handkerchief, even, is a great protection. The warmer you are, the greater need for this precaution, for a damp vapour is immediately generated, to be absorbed by the clothing, and to cool you off too rapidly.

Let the whole beard grow, but no longer than some three inches. This strengthens and thickens its growth, and thus makes a more perfect protection for the lungs against dust, and of the throat against winds and cold in winter, while in summer a greater perspiration of the skin is induced, with an increase of evaporation; hence, greater coolness of the part on the outside, while the throat is less feverish, thirsty, and dry.

Avoid fat and fat meats in summer, and in all warm days.

Whenever it is possible, do, by all means, when you have to use water for cooking or drinking from ponds or sluggish streams, boil it well; and when cool, shake it, or stir it so that the oxygen of the air shall get to it, which greatly improves it for drinking. This boiling arrests the process of fermentation which arises from the presence of organic or inorganic impurities, thus tending to prevent cholera and all bowel diseases. If there is no time for boiling, at least strain it through a cloth.

Avoid hard water, either for drinking pure or when converted into tea or coffee, or soup, because hard water is always strongly impregnated with lime. Hard water may be softened by boiling it; let it become cold, then use it as a beverage.

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It is always best to leave the table at meals with a feeling that you could eat a little more.

If troubled with headache, abstinence from food will often cause it to pass away.

The risible nerves need using as much as any other—the brain and body are both exercised by laughter.

Three or four nails put in a demijohn of cider, and allowed to remain there, will be found an excellent tonic.

A cupful of water is sufficient for one meal.

Never enter a sick room in a state of perspiration, as the moment you become cool your pores absorb. Do not approach contagious diseases with an empty stomach, nor sit between the sick and the fire, because the heat attracts the thin vapour.

It is hurtful to the feet to wear any covering that is air-tight over them, and for this reason India-rubber overshoes should never be worn except in wet, splashy weather, and then not very long at once.

For dust in the eyes, avoid rubbing; dash water into them, remove cinders, etc., with the round point of a lead pencil.

Remove insects from the ear by tepid water; never put a hard instrument into the ear.

If an artery is cut, compress above the wound; if a vein is cut, compress below.

If choked get upon all fours and cough.

Before passing through smoke, take a full breath and then stoop low; but if carbon is suspected, then walk erect.

Suck poison wounds, unless your mouth is sore; enlarge the wound, or, better, cut out the part without delay. Hold the wounded part as long as can be borne to a hot coal or end of a cigar.

If in water, float on the back, with the nose and mouth projecting.

For apoplexy, raise the head and body; for fainting, lay the person flat.

Pounded alum purifies water (the water stirred at the time). It will, after the lapse of a few hours, by precipitating to the bottom the impure particles, so purify it that it will be found to possess all the freshness and clearness of the finest spring water. Four gallons may be purified by a single teaspoonful.

Nine ounces of pure, fresh lime, dissolved in forty gallons of water, will purify 560 gallons of hard water; the precipitate is chalk. It takes sixteen hours for the water to settle, and all the impurities to fall to the bottom of the vessel which contains the water.

HINTS ABOUT CLOTHING.

The clothing should be close fitting in winter and loose in summer, never wearing more around the neck than, if left-off entirely there would be no danger of catching cold. Red flannel is the best material for under-clothing. The shoes should be easy-fitting, strong, broad soles, with cork inside in winter, or woollen stockings. Chest-protectors of red flannel, and stomach-protectors of the same kind of goods should be worn if lungs or stomach are affected. Light head-gear is always best. Fur caps and mufflers are unnecessary articles, and generally do more harm than good to those using either. Too much bed-clothing has a weakening tendency. Black cloth, when worn where contagious diseases exist, has a tendency to affect the wearer, or others he may afterwards come in contact with. Nurses and physicians would do well to avoid black, especially cloth. The advantages of flannel goods are appreciated by the army, the navy, the police, seafaring men, and all employed out of doors, as it absorbs the heat, keeps out the cold, and wards off sickness. Flannel should be changed at least once a week, and it would be well to air them before wearing. No garment worn during the day should be kept on at night when sleeping, where this is possible. If wet through, strip as soon as possible, rub with coarse towels, and make an entire change; it is letting the clothes dry on the person that does the mischief. On general principles, keep the head cool and feet warm by suitable coverings—all hats should be ventilated, and feet well shod. The stockings should be changed at least twice a week.

HOW JOCKEYS ARE REDUCED.

While not advising anyone to try the process, it will be interesting to see what can be done without injury to the human system in the way of reducing flesh. Jockeys are reduced from three to four pounds a day by exercising, bundled up in very heavy clothes, and being sweated an hour at a time between two feather beds. In addition to which, every morning taking a draught of from four to eight drachms of Epsom salts, with from five to twelve grains of julep and a teaspoonful each of tincture and sweet essence of senna, dissolved in a little hot water.

WHAT A MAN CARRIES UP-STAIRS.

In the course of an article on elevators *The Polytechnic Review* remarks: 'Few consider that stair-climbing necessitates an

actual lifting of the whole weight through a vertical distance equal to the height of the stairs. A man weighing 160 pounds, in walking up a flight of sixteen steps, each with an eight inch rise (corresponding to a twelve-foot ceiling), in a time of twenty seconds, has lifted 1,920 pounds a foot high in that time—nearly a ton weight. To climb to the top of a four-storey building—say fifty-two feet vertically to the fourth floor—in ninety seconds represents the lifting of 3,300 pounds a foot high in that time. Reduced to minute foot-pounds, this equals 5,583 pounds lifted a foot high in a minute, or one-sixth horse-power.

### PHILOSOPHY OF EATING.

Dr. Prout knew a person on whom mutton acted as poison. He could not eat mutton in any form. The peculiarity was supposed to be owing to caprice; but the mutton was repeatedly disguised, and given to him unknown, but uniformly with the same result of producing violent vomiting and diarrhoea; and from the severity of the effects, which were, in fact, those of virulent poison, there can be little doubt that, if the use of mutton had been persisted in it would soon have destroyed the life of that individual. Dr. Ferri, who quotes this passage, adds: 'I know a gentleman who had repeatedly had an attack of indigestion after the use of roast mutton.' Some persons, it is known, cannot take coffee without vomiting; others are thrown into general inflammation if they eat cherries or gooseberries. Hahn relates of himself that seven or eight strawberries would produce convulsions in him. Tissot says he could never swallow sugar without vomiting. Many persons are unable to eat eggs; and cakes and puddings having eggs in their composition produce serious disturbances in such persons, if they are induced to eat them under false assurances. The fat of pork, veal, lamb and goose, which some eat with a relish, brings on in others nausea and sometimes vomiting. Strong onions to a delicate stomach produce heart-burn.

### SLEEPING AND EATING.

Persons who eat three times a day should make the last meal of cold bread and butter, and a cup of warm drink. No one can starve on it, while a perseverance in the habit soon begets a vigorous appetite for breakfast, so promising for a day of comfort. By omitting the third meal, the individual, besides securing a night of sound sleep, will

not find on awakening in the morning a bad taste in the mouth, so indicative of general foulness. If one would always have a sweet mouth and clean tongue, he can secure both by simply ceasing to overload the stomach. This frequent eating is an evil, mischievous habit, ruinous of both health and comfort; and it prevents the individual from receiving the great amount of enjoyment which it was intended he should receive from eating, and which is necessary to perfect health. Nothing should be eaten between regular meals taken two or three times a day; nor should one eat so that the quantity ingested will induce heaviness or uncomfortable feelings. The cook tastes the food she prepares, and by this frequent tasting she destroys both the relish for her meals and health. There are many house-keepers who have the same pernicious habit. We know of farmers who, at the close of a long summer's day, during which they have eaten heartily five times, and worked hard from four o'clock in the morning to nine at night, eat freely just before going to bed. The stomach, already enfeebled by constant working under disadvantageous circumstances, has now imposed on it an impractical task, and the men lie down to sleep! Next morning they are all nerveless; have scarcely slept all night; feel more wearied than they did when they laid down; and, on the whole, think the farmer leads a dog's life; so he does, as far as he sinks to mere animalism—living to eat—tasking his digestive apparatus at the expense of health, life, and life's enjoyment. So on, from day to day, till nature makes a desperate effort to rid the body of the superfluous food introduced into it by some different remedial effort. Farmers, being so much in the open air, with abundant exercise, should be the healthiest people; but, like others who are cursed with abundance of bread, they are rheumatic, bilious, dyspeptic. Farmers, your liver complaints, chill-fevers, etc. are unnecessary. Health and sweet sleep will come to you when you need, unless by bad habits you drive them away.

### GOOD COMPANY AND DIGESTION.

All these manifold efforts and stratagems by which food is secured, then prepared by the elaborate machinery of cooks, then digested by the ingenuity of the digestive apparatus, and then conveyed to various organs by the wondrous machinery of the circulation, are set going to bring a little liquid into contact with the delicate mem-

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brane of a cell visible only under the magnifying powers of the microscope. Every organ of the body is composed of millions upon millions of these cells, every one of which lives its separate life, and must be separately fed. In man, self-indulgence and indolence often weaken the digestive machinery, which has, therefore, to be stimulated into activity by condiments, by flavours, and by mental exhilaration; his meals become a banquet. The stimulus of festal excitement, the laugh and conversation of a joyous dinner spur the lazy organs of digestion, and enable men to master food which, if eaten in solitude, silence or sorrow, would lie a heavy lump on the stomach. Eating seems a simple process until long experience has taught us its complexity. Food seems a very simple thing till science reveals its metamorphoses.

HOW TO GO TO SLEEP.

The most natural and facile method is to place the head in a comfortable position, and then, taking a full inspiration, breathe as much as possible through the nostrils. The attention must now be fixed upon the fact of breathing. The patient must imagine that he sees the breath passing from his nostrils; and the very moment he brings his mind to conceive this, apart from all other ideas, consciousness and memory depart, and—he sleeps. The method is strange, but simple, and the experiment will prove its truth. Another method is to imagine a flock of sheep going over a five-barred gate, and keeping track of each one as he passes. As the imagination will see them cross over in many different manners, viz., over, under, and between the bars, all consciousness is gradually dispelled.

TREATMENT OF THE FREE LIVER OF ACTIVE HABITS.

If he only has the power to command himself and to check these practices which he has been indulging in, the free liver has a comparatively easy task to regain his health. But let this be done with due caution; many is the man who has been driven into delirium tremens by suddenly leaving off all stimuli; the best plan is to substitute ammonia in some shape for a part of the accustomed alcohol, and for this purpose to take the following draught once or twice a day, or often if that dreadful sinking sensation comes on which is so distressing to those who have indulged to excess in wine and tobacco. Take of aromatic confection ten grains, sal

volatils one drachm, bicarbonate of soda five grains, tincture of gentian one drachm, water one ounce—mix. The quantity of ale or lager beer, wine or spirits should be diminished one-half every two or three days, until brought down to a small allowance; tobacco should be totally eschewed. Total abstinence from smoking is easier than temperance. There is not the same danger in leaving it off as is the case with wine, spirits or ale—in fact, there is no danger whatever in so doing; whilst in alcoholic drinks the reverse is the case. With regard to the kind of stimulus which should be adopted, much must depend upon the previous habits. In most cases, when the stomach is not much upset, malt liquor will suffice; and, if sound and unadulterated, is the most wholesome beverage; but in many cases it will not do to leave off suddenly wine and spirits, and adhere to malt alone. In such cases an occasional glass of brandy and water or claret must be allowed. The latter, where it agrees, is an excellent wine for the purpose of gradually lowering the stimulus. No wine suits the nervous system better, and if mixed with soda-water it may be drank to considerable extent by those who have accustomed themselves to a stronger stimulus. When the stomach is very much disordered, it may be mulled and taken warm.

Those who have been smoking and drinking to excess have stimulated their kidneys and skin to secrete a greater quantity than is natural to those organs. This is an effort of nature to get rid of the poison which has been absorbed into the system, but the effect does not immediately cease on the removal of the cause. Great care must be taken in the administration of purgatives. No free liver is able to bear strong aperient medicine without some injury to the system; and although very commonly given, it is a practice which ought to be cautiously adopted. If the liver is acting well (which may be known by the yellow or brown colour of the feces), a simple black draught may be taken, consisting of half an ounce of senna, with a small teaspoonful of salts dissolved in an ounce of warm water; or one or two compound rhubarb pills may be taken at night. If, on the contrary, the motions are of a clay colour, five grains of blue pill should be taken at night, followed by the above draught in the morning. Should the bowels be relaxed, and inclined to act more than once a day, a wine-glass full of decoction of bark, with a teaspoonful of the compound tincture of bark, should be taken two or three times a day. If more severe remedies are required the aid of a medical man should be sought for at once. The mind should be occupied,

or rather amused, in some way. This point cannot be too much insisted on, for upon it depends in great measure whatever attempt to restore health to the body shall be successful or the reverse. Bodily exercise without amusement is mere drudgery—it tires, but does not lead to a restoration of power; whilst if given with some mental excitement, the fatigue is scarcely felt; and what little is experienced is speedily followed by a reaction which asks for more work of a similar character and tendency. Let anyone contrast the effects of a walk or ride without object or companion with either the one or the other, when taken for the purpose of making a call, or with any other specific object, especially in company of an amusing companion. From the former (called 'a constitutional' because it does not benefit the constitution) he has returned jaded and out of spirits, whilst from the latter he has experienced an amount of exhilaration varying, of course, with the nature of the object and the agreeability of his companion. Nothing conduces more to a successful prosecution of this plan of self-treatment than the mutual agreement of two persons whose object is the same to assist one another by their example. Let two persons agree in earnest to restrain one another when tempted, and also to amuse one another by sparring or fencing, or riding, or walking together, or, indeed, any kind of gymnastic exercise. This will aid the purpose of both, as far as the restoration of health is concerned, and they will also find it much more easy to 'put the stopper' upon each other than upon themselves, the grand object in all cases being to leave off injurious food and drinks, to avoid smoking and venery, and to take sufficient exercise, conjoined with amusement, to tire without prostrating the muscular system.

During this period the diet should be plain, but varied. Roast beef and mutton, or chops and steaks, with any vegetables that agree with the individual, may be indulged in. Poultry, game and fish are not injurious; and even pastry, if good and plain, will do no harm whatever. In the present day it is scarcely necessary to inculcate the free use of cold water every morning. It is not desirable to bathe during this time, though in warm weather a mere plunge into a river, or, better still, the sea, is very serviceable; but at all seasons the whole body should be sponged every morning, using in very cold weather water at the temperature of sixty or sixty-five degrees of Fahrenheit. The body should be well rubbed with a rough towel until a glow is produced; and the aid of an assistant is here

very beneficial. Such is the comparatively easy task of those who have continued to take strong exercise, concomitantly with their free indulgence in wine, tobacco, and all their little etceteras.

### REBUILDING THOSE BROKEN DOWN BY LITERARY AND SEDENTARY PURSUITS.

Persons who are desirous of excelling in literary pursuits must bear in mind that; without bodily health, the mind is unfitted for exertion in acquiring knowledge. It is true that many men who have already stored their brains with facts are enabled, even after becoming complete valetudinarians, to impart knowledge to others; but no one can grapple with difficulties for himself while in that state; much time is often lost and strength squandered through over-anxiety in reading; but if eight, or, at most, ten hours a day, are well employed—that is to say, if any man really works hard during that time—he will have done all of which his mental powers are capable. This will leave him seven or eight hours for sleep, and six or seven for meals, exercise, etc. Few men, however, of ardent temperaments and studious habits, are capable of thus portioning their time; but they may depend upon the fact that, beyond the hours named, they will gain nothing by poring over mathematical problems or classical authorities. It is needless to remark that, in a mind upset by literary study or mercantile accounts, the best plan, if practicable, is to give up reading and writing entirely for a time; but this is seldom to be effected; and, if not, all that can be done is to improve the health of the body as much as possible whilst the strain upon the mind continues. In the case of a man who can arrange his own hours of study, and has only a certain object to effect by a given time, he ought in no case to exceed eight hours a day, and, if possible, not more than six. This will leave him ample time for the prosecution of any bodily training which he may require; and, if the health has not been much impaired, and the constitution is naturally strong, he will find that, in proportion as he is able to increase the amount of bodily exercise, so will his mental powers recover their tone. Few reading men determine upon preparing for a course of training until they are a good deal upset by confinement, and in them some little care is necessary. First and foremost, they must give up smoking, green tea, and coffee, except at meals. There should be no over-

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stimulation of the brain; but what work is done should be done without any unnatural stimulus. The hours of study should be divided into two equal periods—the first commencing immediately after breakfast, and the second immediately after supper. In this way all the middle of the day may be given up to recreation, dinner and exercise; and the following hours are the most proper, though of course they may be slightly varied to suit particular circumstances: breakfast at 8; reading, 8.30 to 12.30, light lunch on biscuit or sandwich, and a glass of ale or sherry and water; exercise, from 12.30 to 4.30; dinner at 4.30; relaxation of body and mind till 6.30; then take a cup or two of coffee or black tea; then read for two, three, or four hours, according to circumstances; then go to bed. When first these hours are adopted the exercise must be very gentle and of an amusing character; if on horseback, so much the better. Many men are able to indulge in a nap after dinner with advantage to themselves; but, generally speaking, it is prejudicial. If, however, the mouth feels moist on waking, and there is no palpitation of the heart or flatulence, it does good rather than harm. The reason why sleep after dinner is said to disagree with everybody is, that it is so often interrupted that it seldom has fair play. Now, disturbed sleep we know to be prejudicial at any hour; and, if it cannot be obtained without much chance of interruption, it is better to avoid it altogether. If, however, an hour, or rather more, can be devoted to a nap, and it is found to agree with the individual trying it, the mind will be refreshed as well as the body; after a cup of tea or coffee, the studies may be prosecuted with renewed vigour.

With regard to the counting-house clerk, the hours are fixed, and all that can be done must be done before 9 or 9.30 a.m.; or, in the summer season, after office-hours. The best course to pursue is to arrange so that it will be positively necessary to walk backwards and forwards to the office night and morning. This is much better than attempting a walk without any special object. Thus, by devoting only one hour, night and morning to a four-mile walk to the place of business, sufficiently bodily exercise may be obtained to keep the health tolerably good during this season. It is the custom for one-third or one-half of the young men to dine first, and then, as soon as they have hastily swallowed their meal, for the next division to take their places. This plan is supposed to be very advantageous to the proprietors—but even this fact is very doubtful—but to the assistants it is very injurious. In many

cases ten hours a day (in some few, even a longer period) are given up to work, interrupted only by a scramble for a meal. This is more than the human frame is calculated to bear; even the farm labourer, or the 'factory hand,' is allowed his breakfast and dinner hour, after which he returns to his work, having laid in a fresh stock of nervous excitability. The consequence of the long strain upon the mind and animal spirits is, that at times they are overpowered, and that errors occur which do more harm to the parties interested than is counterbalanced by the apparent saving of time.

#### ADVANTAGES OF PEDESTRIANISM.

By a strict attention to exercise, the tone and vigour of the moving powers are wonderfully increased; the nervous energy and circulation of the blood are materially accelerated; and this increased impetus of the blood through the whole system produces an affectual determination to the surface of the skin, and free perspiration is the consequence. By the same means, the body is disposed to sleep, the appetite increased, and the blood is determined from the internal viscera, which prevents as well as removes obstructions, and powerfully obviates the tendency to a plethoric fullness of the system. By exercise the spirits are enlivened and the body refreshed; it gives strength to the body and vigour to the mind, and it is an irrefragable truth that, where it is improperly neglected, the energy and strength of the whole machine fails to decay. Exercise on foot is allowed to be the most natural and perfect, as it employs every part of the body, and effectually promotes the circulation of the blood through the arteries and veins. Walking, the most salutary and natural exercise, is in the power of everybody, and we can adapt its degree and duration to the various circumstances of health. By this means the appetite and perspiration are promoted, the body is kept in proper temperament, the mind is enlivened, the motion of the lungs is facilitated, and rigidity of the legs, arising from too much sitting, is relieved. The most obstinate disease and the most troublesome hysterics and hypochondriacal complaints have been completely cured by perseverance in walking. Pedestrian feats, even when carried to excess, are seldom attended by any pernicious effects. The exhaustion occasioned is only temporary, for the wearied frame is speedily recruited, by the luxury of rest and refreshment. But certain rules may be observed which will render walking both

easy and agreeable. A light yet firm and manly step, an erect posture, especially in regard to the head, the breast and shoulders, should be the chief objects of attainment. By care and attention a person may thus learn to walk gracefully and with little bodily fatigue. Early and constant practice gradually forms the pedestrian for the accomplishment of the greatest undertakings; but even in the common intercourse subsisting in society, facility of walking is requisite for individual convenience and comfort. Hence it is best to study the gait and manner of noted pedestrian.

#### DIFFERENT MODES OF WALKING.

Walking displays much of the character of the walker—it is light and gay in women and children, steady and grave in men and elderly persons, irregular in the nervous and irritable, measured in the affected and formal, brisk in the sanguine, heavy in the phlegmatic, and proud and humble, bold or timid, etc., in strict correspondence with individual character. A firm yet easy and graceful walk is by no means common. There are few men who walk well if they had not learnt to regulate their motions by the lessons of a master, and this instruction is still more necessary for ladies. Walking may be performed in three different times—slow, moderate, or quick—which sometimes modify its action.

**THE SLOW WALK OR MARCH.**—In the march, the weight of the body is advanced from the heel to the instep, and the toes are most turned out. This being done, one foot—the left, for instance—is advanced, with the knee straight and the toe inclined to the ground, which, without being drawn back, it touches before the heel, in such a manner however, that the sole toward the conclusion of the step, is nearly parallel with the ground, which it next touches without its outer edge; the right foot is then immediately raised from the inner edge of the toe, and similarly advanced, inclined, and brought to the ground, and so on in succession. It must be observed that the toe's first touching and last leaving the ground on the march, gives to it a character of elasticity and of spirit, vigour or gayety, and that, when this is laid aside and the whole sole of the foot is at once planted on the ground, it acquires a character of sobriety, severity or gloom, which is equally proper to certain occasions. This observation is in a less degree applicable to the following paces:

**THE MODERATE PACE.**—Here the weight of the body is advanced from the heel to the ball of the foot, the toes are less turned out,

and it is no longer the toe, but the ball of the foot, which touches and last leaves the ground, its outer edge, or the ball of the little toe, first breaking the descent of the foot, and its inner edge, or the ball of the great toe, last projecting the weight. Thus in this step less of the foot may be said actively to cover the ground, and this adoption of nearer and stronger points of support and action is essential to the increased quickness and exertion of the pace. The mechanism of this pace has not been sufficiently attended to. People pass from the march to the quick pace they know not how, and hence all the awkwardness and embarrassment of their walk when their pace becomes moderate, and the misery they endure when this pace has to be performed by them unaccompanied by the middle of a long and well-lighted room, where the eyes of a brilliant assembly are exclusively directed to them.

**THE QUICK PACE.**—Here the weight of the body is advanced from the heel to the toes, the toes are least turned out, and still nearer and stronger points of support and action are chosen. The outer edge of the heel first touches the ground, and the sole of the foot projects the weight. It is important to remark as to all these paces that the weight is successively more thrown forward, and the toes are successively less turned out. In the general walking of ladies, the step ought not to exceed the length of the foot; the leg should be put forward, without stiffness, in about the fourth position, but without any effort to turn the foot out, as it throws the body awry, and gives the person the appearance of a professional dancer. The arms should fall in their natural position, and all their movements and oppositions to the feet should be easy and unconstrained, and the pace should be neither too slow nor too quick. The gait should be in harmony with the person—natural and tranquil, without giving the appearance of difficulty in advancing, and active, without the appearance of being in a hurry. Nothing can be more ridiculous than a little woman who takes innumerable, minute steps with great rapidity to get on with greater speed.

#### LENGTH OF HUMAN LIFE.

At the beginning of the present century the average duration of human life was as low as 18. In 1860 it was authenticated as having reached 43 years. In Geneva, Switzerland, an accurate and continuous account of this subject has been kept for three centuries, with the following results:

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From A. D. 1500 to 1600, the average was 21 years and 2 months; from 1600 to 1700, 25 years 9 months; from 1700 to 1800, 30 years.

Among the ancient Romans, according to Ulpian, the average was 30 years. In 1860 the average for Great Britain was 45 years. In France it was fixed at 42, and in the United States at 43 years.

DURATION OF LIFE AMONG ARTISTS.

In Gould's Dictionary of Arts, published in 1839, the names, with the ages, of 1,122 persons are given, which furnish the following remarkable facts as to the longevity of this class of men: Died under sixty years old, 474; sixty years and under seventy, 250; seventy years and under eighty, 243; eighty years and under ninety, 134; ninety years and under a hundred, 19; above a hundred, 1.—the mean age at death of the whole number being 55 years, from which it would appear that the pursuit of the fine arts has a tranquilizing effect upon the spirits, and a tendency to moral refinement in the habits and manners of its professors, extremely favourable to the prolongation of life.

HOW TO TAKE CARE OF THE EYES.

Do not read or write before sun-up or sun-down is advised by *Hall's Journal of Health*. Let the light fall upon the page from behind. Never read while lying down. Those whose eyes are weak should never read or sew by candle or gaslight, nor by twilight. Suffer nothing to be applied to them unless by the special advice of an experienced physician. If the lids stick together in the morning on waking up, moisten them with the saliva, it softens and dissolves the matter sooner than any liquid known. The best and safest treatment for most affections of the eyes is rest, especially if weak or inflamed, rest from reading, writing or sewing, from every use of them which requires close observation, spending a large portion of the time out of doors, as then large objects are mostly viewed. Persevere in this for weeks and months if necessary, and if not then relieved, consult a physician. Avoid reading on horseback or in rail cars or in any wheeled vehicle while in motion. Many persons will find that in reading before breakfast an effort is required to keep the sight clear, but after breakfast no such difficulty is experienced; the reason is, the eye under such circumstances is

more or less inflamed, that is, has too much blood about it, but nature calls that excess of blood away to the stomach after eating, to enable it to perform its work more thoroughly. Therefore, persons with weak eyes should not read or write or do fine sewing on empty stomachs. We have but one right to loose, its preservation merits all our care, and it is unwise to tamper with, or experiment upon an organ so indispensable to our comfort, happiness and usefulness.

DANGER OF CHECKING PERSPIRATION.

Perspiration reduces the heat (by evaporation) to a healthy standard. Checked perspiration (says *Hall's Journal of Health*) is the fruitful cause of sickness, disease and death to multitudes every year. If a teakettle of water is boiling on the fire, the steam is seen issuing from the spout, carrying the extra heat away with it, but if the lid be fastened down and the spout be plugged, a destructive explosion follows in a very short time. Heat is constantly generated within the human body, by the chemical disorganization, the combustion, of the food we eat. There are 7,000,000 of tubes or pores on the surface of the body, which in health are constantly open, conveying from the system, by what is called insensible perspiration, this internal heat, which having answered its purpose, it passed off like the jets of steam which are thrown from the escape-pipe, in puffs, of any ordinary steam-engine; but this insensible perspiration carries with it, in a dissolved form, very much of the waste matter of the system, to the extent of a pound or two or more every twenty-four hours. It must be apparent, then, that if the pores of the skin are closed, if the multitude of valves, which are placed over the whole surface of the human body, are shut down, great harm results. When over-heated cool off slowly; never in a strong draught of air. Gentle fanning, especially if the face is wet with cold water, will soon produce a delightful coolness, which leaves no disagreeable results. If perspiring from walking, rowing or other exercise, on reaching the place of bathing do not (as some advise) sit down on the bank to cool off before entering the water. Doff your clothes and dash in as soon as possible, only being careful to keep up the exercise without intermission after you are in the water. In this way you continue the glow which you experienced from the previous exercise.

## ON FOOD AND DRINKS.

Strong tea has the power of retarding the waste of the system, and a small quantity of food with tea will go farther than a larger quantity taken with any other liquid except coffee, which resembles tea in this respect.

Four ounces of bread are more than equal to eight ounces of potatoes, and yet do not satisfy the hunger for the time nearly so well. It is a question whether in six hours the stomach would not require a second meal more imperatively after the potatoes than after the bread.

Bread, fruit and vegetables are preferable to other kinds of food to those of full habit or of excitable temperament.

Oatmeal in any shape is healthy, and gives strength and brain power. When mixed with currents it is an excellent diet for regulating the bowels.

The preparations of wheaten flour known as *vermicelli* and *macaroni* are very nutritious and easily assimilated.

There is more phosphate in coarse brown bread than in white.

Ice water, being only 10 degrees colder than spring water, is not considered injurious by many physicians.

Dr. John C. Draper, in his work on Anatomy and Physiology, contends that meat should be kept long enough to be slightly tainted before being used, and cites venison and game as the most wholesome food on this account. He considers lamb and veal particularly indigestible. He says pork should not be eaten in the hot months, and with truth asserts that animals are slaughtered for our markets without any regard to age or condition.

Tea and coffee are recommended after fatigue as very beneficial in repairing tissue. Coffee is in great favour with all brainworkers, and when taken without milk and sugar (we mean good coffee, not half-ground peas and beans) is a capital revivifier.

Chocolate is considered as having a tendency to bring on dyspepsia.

Lemons and sugar water partake of the same nature as vinegar, which, while it reduces the flesh and makes 'spider waist,' also in time reduces the whole system.

Potatoes are best roasted, and should be cooked so that they fall apart.

Any kind of water containing lime or other substances should always be boiled before drinking.

Roasted meat contains more nutritive material than boiled. Boiling is the best method of all.

The dark meat in fowls is the most whole-

some, notwithstanding many people give their preference to white meat.

The food of castrated animals or birds is better than the entire male or female.

Welsh rarebits are very indigestible, and when served with poached eggs known as 'Golden Bucks' are considerably more so.

Clams create the most violent pains and vomiting when eaten by those they do not agree with.

Melons, celery, lettuce, water-cresses and tomatoes are very wholesome.

Salt-beef produces scurvy, because the soluble salts are removed from the beef by brine, in consequence of which it cannot restore to the human system those salts which are essential to preserve the blood in a healthy state.

Vegetables and fruits should enter into family consumption even if purchased for sanitary reasons. Among those which contain the most saccharine matter, sweet potatoes, parsnips, beets and carrots are the most nourishing.

Roast pork, besides being an expensive dish, requires a too lengthy drain upon the forces of the stomach to be a healthy article of diet.

Twice cooked meat is not considered wholesome.

Watermelons when eaten regularly are an excellent aperient, but if eaten extravagantly and irregularly the bowels become costive and sickness is the result.

Lamb and veal taint more quickly because they contain a large quantity of albumen, which is very liable to undergo putrefaction.

Dyspeptics, nervous people, and brainworkers should not eat potatoes except in great moderation, and I generally advise them not to eat them at all, says Dr. Holbrook in 'The Herald of Health.' They do not contain phosphorus and mineral matter enough for the nerves. They are apt to produce a condition of nervous despondency which is very depressing. Adding butter to potatoes is a mistake. True, it makes them taste better, but the melting butter covers the starch grain with a coat of oil which prevents the juices of the intestines from getting at it; and, as for the gastric juice, it has no influence on starch and cannot digest it. If eaten, they should be eaten with a little salt and pepper, but without butter. The best way to cook them is to boil or bake and serve hot and meaty.

## BRAIN FOOD.

Experience shows that highly phosphatic

and easily soft-boiled fowls, oysters more than is especially minds are and in purchased by business. purpose is it contains which it is

## EGGS

No artificial nutrition is a difference owing to the birds; yet creatures with human bodies is nearly there are almost consist in water. Eggs much time to four hours gested when partially cooked. An ordinary and a half from two to sea-gull and ounces; and to six ounces in the duck egg by about Edward Smith an egg weighs consists grains of nitrogen carbon and other in The S the value of sustaining to the value of to 890. As egg is about hen may be el of corn yet eighteen pounds to saying this of corn will pound of weight contrary, requires pounds of two eggs are ten cents a p

and easily digested food, such as oatmeal, soft-boiled eggs, boiled flesh, the flesh of fowls, oysters and kale food (phosphorized more than most other grains and vegetables), is especially suitable to persons whose minds are overtaxed by intellectual duties, and in purely nervous affections it is recommended by physicians who understand their business. Very recommendable for this purpose is the liquid acid phosphate, because it contains the phosphorus in a condition in which it is most easily assimilated.

EGGS AS AN ARTICLE OF DIET.

No article of food is more wholesome and nutritious than that supplied by eggs. There is a difference in their flavour and quality, owing to the difference in the diet of the birds; yet there are no eggs of winged creatures which are unfit for nourishing the human body. Their chemical composition is nearly the same, for the white and yolk are almost invariably present; and these consist, in the first case, of albumen and water. Eggs require for digestion about as much time as mutton—that is, from three to four hours. They are most readily digested when boiled until the white becomes partially consolidated.

An ordinary hen's egg weighs from one and a half to two ounces; a duck's egg, from two to three ounces; the egg of the sea-gull and the turkey, from three to four ounces; and the egg of the goose from four to six ounces. The solid matter and the oil in the duck's egg exceed those in a hen's egg by about one-fourth. According to Dr. Edward Smith, in his treatise on 'Foods,' an egg weighing one ounce and three-quarters consists of 120 grains of carbon and 18½ grains of nitrogen, and 15.25 per cent. of carbon and 2 per cent. of nitrogen. A writer in *The Scientific Farmer* estimates that the value of one pound of eggs as food for sustaining the active forces of the body is to the value of one pound of lean beef as 1,584 to 990. As a flesh producer, one pound of egg is about equal to one pound of beef. A hen may be calculated to consume one bushel of corn yearly, and to lay twelve dozen or eighteen pounds of eggs. This is equivalent to saying that three and one-tenth pounds of corn will produce, when fed to a hen, one pound of eggs. A pound of pork, on the contrary, requires about five and one-third pounds of corn for its production. When eggs are twenty-four cents a dozen, and pork ten cents a pound, we have a bushel of corn

feed production \$2.88 worth of eggs and \$1.05 of pork.

NUTRITIVE QUALITIES OF TOMATOES.

Dr. Bennet, a professor of some celebrity, considers the tomato an invaluable article of diet, and ascribes to it various important medicinal properties. First: That the tomato is one of the most powerful aperients of the liver and other organs; when calomel is indicated, it is probably one of the most effective and least harmful remedial agents known to the profession. Second: That a chemical extract will be obtained from it that will supersede the use of calomel in the cure of disease. Third: That he has successfully treated diarrhoea with this article alone. Fourth: That when used as an article of diet, it is an almost sovereign remedy for dyspepsia and indigestion. Fifth: That it should be constantly used for daily food, either cooked or raw, or in the form of catsup; it is the most healthy article now in use.

DIETARY PECULIARITIES.

Roman soldiers—who conquered the world, and built roads from Lisbon to Constantinople, and who were all trained athletes, marching under a weight of armour and luggage that few men in our day could carry—lived on coarse brown wheat or barley bread, which they dipped in sour wine. In our own day the Spanish peasant is among the strongest and most agile men in the world. He will work all day in a copper mine, or at the olive-press, or at the wine-press, under a hot sun, and then dance half the night to the music of a guitar. What does he live on? A piece of black bread, an onion, perhaps half a watermelon. You may see him dipping his piece of bread into a horn of olive-oil, and then into some vinegar, made hot with pepper and garlic, and he is happy. Sometimes he gets a draught of harsh, sour wine, but not strong. All the strong wine is sent to England. The Smyrna porter walks off with a load of eight hundred weight. His only food, day after day, is a little fruit, a handful of dates, a few figs, a bunch of grapes, and some olives. He eats no beef, pork or mutton. The most tremendous muscular force and the greatest powers of endurance may be nourished upon a moderate diet. All parts of animals, excepting some of the secretions, are, or have been, employed as food. Among the ancient

Romans the brains of the ostrich and peacock, and tongues of nightingales and other singing birds were much sought after. They were also very fond of the flesh of the young ass; and young fat puppies were a great dainty in Corsica, and continue to be held in high repute among the Chinese. At the present time the Tartars esteem the after-birth or placenta as a great delicacy, and the civilized disciple of Epicurus in our own country regards the trail of the woodcock as the *bonne bouche* of his most luxurious diner. Among the extraordinary substances employed as food we may cite the instance of the quarrymen of Thuringia, who eat a substance called rock-butter, which they spread on their bread. A species of olay is an article of diet among the Ottomans of South America, and Humboldt states that they devour enormous quantities, so that their stomachs are greatly distended; he also thinks that they derive some nutriment from it. The amount of nutriment that may exist in substances which are apparently devoid of it is well shown by the growth of gold-fish, which are kept for years in a small globe of water, and, though they are never fed, obtain sufficient food from the animalcules in the water, and animal and vegetable ova falling into it from the circumambient air, to reach a very considerable size.

George Seward, the American Wonder—whose 100 yards in 9½ seconds, and 200 yards in 19½ seconds, although performed thirty years ago, has never been beaten—trained chiefly on pork, milk, pancakes and confectionery. Though he did not do so much work he was a singularly muscular young man.

#### EFFECTS OF ALCOHOL, STIMULANTS AND TOBACCO.

Liquors as stimulants are injurious when taken before exercise or on an empty stomach—after either, when taken in small quantities, they have a tendency to aid in restoring the system to its perfect state. When indulged in too freely, liquor utterly destroys the tissue of the kidney and other organs, and produces such changes in the substance of the brain as to cause incapacity and mania. Old wines are less liable to produce kidney or liver complaints. Claret wine is the best adapted for ordinary daily use, since it contains but little alcohol, and its astringent, bitter principles often aid a feeble, digestive apparatus. Port has a tendency to produce gout. Ale, porter, beer,

cidar and perry are the best tonics; to those they agree with.

The *Quarterly Journal of Inebriety* says: It is estimated that coffee, both beans and leaves, is drunk by 60,000,000 of the human family. Tea of all kinds is used by 500,000,000 and opium by 400,000,000; alcohol, in its various forms, 500,000,000 of the human race. Tobacco is probably used by 700,000,000 or 800,000,000. These startling facts indicate a large proportion of the race using some substances that are either stimulants or narcotics. The work of the physiologist, in the future, will be to determine the true place in nature of these substances and indicate where their use ends and abuse begins.

The use of snuff is, perhaps, the least injurious of all the methods of employing tobacco; but when indulged in to excess it is the most disgusting, and liable to produce dyspepsia. It sooner or later deadens the sensitiveness of the olfactory nerve to such an extent that the sense of smell is lost.

When a person smokes to excess there is no longer a mere sedative action, but the nervous system is powerfully affected, the hands tremble, and the action of the heart is interfered with, palpitation being induced. It is also stated that the long-continued use of tobacco in any form, and especially smoking, gradually blunts the virile powers, and finally renders men impotent.

Chewing is one of the most offensive methods of employing tobacco, and is very apt to produce dyspepsia.

#### EXPERIMENTS ON THE SMOKE OF TOBACCO.

*Foriopa Journal* contains an interesting article on the habit of tobacco smoking, and on poisoning by nicotine. Among the facts there mentioned, are experiments instituted by M. Malapert, pharmacist of Poitiers. His intention was to ascertain the exact quantity of nicotine absorbed by smokers in proportion to the weight of tobacco consumed. The apparatus used consisted of a stone jar, in which the tobacco was made to burn connected with a series of bottles communicating with a series of bottles. The bottles were either empty, or contained some water mixed or not with a little sulphuric acid. From a few experiments it was found that, in the smoke of tobacco extracted by inspiration, there is ten per cent. nicotine. Thus a man who smokes a cigar of the weight of seventy grains receives in his mouth seven grains of nicotine, mixed with a lit-

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#### TABLE OF

Apples, raw...	P
Beans, boiled...	
Beans, French...	
Beef, roasted...	
Bread.....	
Butter.....	
Cabbage, boiled...	
Cucumbers, raw...	
Carrots.....	
Fish, hulled.....	
Lentils.....	
Meal.....	

#### BEATMONT'S

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Beans, pod, boil-	
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Beef, fresh, dry	
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the watery vapour, tar, empy-reumatic oil, etc. Although a large portion of this nicotine is rejected, both by the smoke puffed from the mouth and by the saliva, a portion of it is, nevertheless, taken up by the vessels of the buccal and laryngeal mucous membrane, circulated with the blood, and acts upon the brain. With those unaccustomed to the use of tobacco, the nicotine, when in contact with the latter organ, produces vertigo, nausea, headache and somnolence, while habitual smokers are merely thrown into a state of excitement similar to that produced by moderate quantities of wine or tea. From further investigation it was found that the dryer the tobacco the less nicotine reaches the mouth. A very dry cigar, while burning, yields a very small amount of watery vapour; the smoke cools rapidly, and allows the condensation of the nicotine before it reaches the mouth. Hence it comes that the first half of a cigar smokes more mildly than the second, in which a certain amount of condensed watery vapour and nicotine, freed by the first half, are deposited. The same remark applies to smoking-tobacco in pipes; and if smokers were prudent, they would never consume but half a cigar or pipe, and throw away the other. Smoking through water, or with long tubes and small bowls is also a precaution which should not be neglected.

Tobacco as a medicine is narcotic, emetic and cathartic. When first used it often occasions vomiting and brings on a fit of sickness easier imagined than described.

Beets, boiled	3:45
Bread, wheat, fresh baked	3:80
Bread, corn	3:15
Butter, melted	3:30
Cabbage with vinegar, raw	2:00
Cabbage, boiled	2:30
Catfish, fried	4:30
Cheese, old, strong, raw	3:30
Codfish, cured, boiled	2:00
Corn, green, and beans, boiled	3:45
Mustard, baked	2:45
Duck, domestic, roasted	4:00
Ducks, wild, roasted	4:30
Eggs, fresh, hard boiled	3:50
Eggs, fresh, soft	3:50
Fish, fresh, fried	3:50
Flounder, fresh, fried	3:50
Fowl, boiled	4:00
Fowl, roast	4:00
Fowl, fricasseed	2:49
Goose, roast	2:05
Lamb, fresh, boiled	2:30
Liver, beef, boiled	2:00
Milk, boiled	2:00
Milk, raw	2:15
Mutton, fresh, roast	3:15
Mutton, fresh, boiled	3:00
Mutton, fresh, broiled	3:00
Oysters, fresh, raw	2:55
Oysters, fresh, roast	3:15
Oysters, fresh, stew	3:30
Parsnips, boiled	2:30
Pork, fat and lean, roast	6:15
Pork, fat and lean, broiled	3:15
Pork, fat and lean, raw	3:00
Potatoes, Irish, boiled	3:30
Potatoes, fresh, baked	2:30
Rice, boiled	2:30
Sugar	3:30
Sago, boiled	1:45
Salmon, salted, boiled	4:00
Soup, beef, vegetable	4:00
Soup, chicken, boiled	3:30
Soup, oyster, boiled	3:30
Tapioca, boiled	2:00
Tripe, soured, boiled	1:00
Trou, salmon, fresh, boiled or fried	1:30
Turkey, domestic, roast	3:30
Turkey, wild roast	2:18
Turnips, boiled	3:30
Veal, fresh, broiled	4:00
Veal, fresh, fried	4:30
Venison steak, boiled	1:35

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TABLE OF COMPARATIVE NUTRITION.

	Per cent.		Per cent.
Apples, raw	10	Milk, fresh	7
Beans, boiled	37	Mutton, roasted	30
Beans, French	22	Pork, roasted	24
Beef, roasted	26	Poultry, roasted	27
Bread	80	Potatoes, boiled	13
Butter	96	Rice, boiled	38
Cabbage, boiled	7	Spinach	14
Cucumbers, raw	9	Sugar	98
Carrots	14	Turnips, boiled	6
Fish, boiled	30	Veal, roasted	25
Lentils	91	Venison, boiled	23
Meal	31		

BEATMONT'S TABLE OF DIGESTION.

	H.M.
Apples, sweet, raw	1:33
Apples, sour, meadow, raw	2:00
Beans, pod, boiled	2:30
Beef, fresh, rare, roasted	3:00
Beef, fresh, dry	3:30
Beef, fresh, fried	4:00

INTERESTING PHYSIOLOGICAL FACTS.

Man's maximum weight is reached at the fortieth year; it then remains nearly stationary until the sixtieth year, when it commences to diminish until death.

The average weight of men between 25 and 40 is about 140 lbs., and of women 120 lbs. The average duration of life is about 41 years, the mortality being greatest in its earlier period.

The full growth is usually attained at about the age of 21, although many persons continue to grow to the twenty-fifth year.

The average height of an adult, according to Quetelet, is 5 feet 8 inches.

At birth boys are heavier than girls; the average weight being 6½ lbs.

The life of man may be divided into five periods : 1st, the fetal ; 2nd, the infantile ; 3rd, the adolescent ; 4th, the adult ; and 5th, that of old age.

The average length of the newly-born male infant is 18½ inches, while that of the female is 18 inches.

The temperature of the body should not exceed 98 degrees.

The weight of blood is equal to one-eighth of the total weight of the body.

The blood of males is heavier than that of females.

The number of pulsations of the heart in a minute, varies with the age of the individual, being 130 to 140 at birth, 80 to 85 during childhood, 70 to 75 during adult life, and 50 to 65 in old age.

The weight of brain is equal to about one thirty-sixth of the total weight of the body.

In the course of a year man takes into his system more than 3,000 pounds of materials, viz. : water, 1,500lbs. ; food, 800lbs ; air, 800lbs. In the same length of time man ejects the same amount, consisting of expired air, perspiration, urine and feces.

As long as the bones are not solidly united with their epiphyses the creature grows. In man this solidification takes place at the age of twenty.

The elevation of the air is supposed to be 50 miles.

The human body is said to undergo a complete renewal every seven years.

It has been proved by experiment that the muscle taken from a healthy animal after death will bear more weight and decompose slower than that taken from an unhealthy animal.

The atmospheric pressure on all bodies is at the rate of fifteen pounds to every square inch.

The skin of a large man is 16 feet square, and the weight his body supports is 34,560 lbs.

Ordinarily, persons breathe once while the pulse beats four times, or 17 times a minute, and during that time the pulse numbers 70 strokes.

The duration of life is given by the duration of growth ; the duration of growth is given by that of gestation ; the duration of gestation by the height of the stature.

Man is twenty years in growing, and should live five times twenty—according to M. Flourens—100 years.

Twenty-four hogheads of air are said to enter a pair of full grown lungs daily.

An undue proportion of lime in the system is the cause of premature gray hair in many cases.

After the enamel of the tooth is wore off, the dentine or ivory is full of little tubes filled with lime ; now the acids of saliva, mucus, and food, dissolve this lime and fill the tubes with foreign matters ; after which, the tubes dissolve or crumble away, leaving the nerve exposed, and the pain of toothache ensues.

Food is the fuel of the body. The carbon of the food mixing with the oxygen of the air evolves heat in the same way that a fire or candle does.

Old people are far-sighted, because the humours of their eyes are dried up by age ; in consequence of which, the cornea sinks in, or becomes flattened.

The colouring matter of the blood is formed by very minute globules floating in it. The oxygen (uniting with the coats of these globules) makes them milky—and the dark colouring matter of the blood (seen through this milky coat) appears of a bright red.

Food is converted into blood in the following manner : After it is swallowed, it is dissolved in the stomach into a gray pulp called chyme ; it then passes into the intestines, and is converted by the bile into a milky substance called chyle.

Running makes us warm because we inhale air more rapidly when we run, and cause the blood to pass more rapidly through the lungs in contact with it. Running acts upon the capillary vessels as a pair of bellows on a common fire.

Reading aloud increases the respiration and creates hunger.

The number of ribs in the human body is twelve on each side, proceeding from the spine to the sternum, or toward it, and serving to inclose and protect the heart and lungs.

The number of bones in the body varies at different ages, but in the adult there are 238. They are divided as follows :

Skull.....	{ Cranial.....	8
	{ Face.....	14
Trunk.....	{ Neck, thorax and abdomen.....	50
	{ Pelvis.....	4
Upper ex- tremities.....	{ Right.....	61
	{ Left.....	61
Lower ex- tremities.....	{ Right.....	60
	{ Left.....	60
Internal ear.....		6
Teeth.....		32
		238

MEDICINAL USE OF SALT.

In many cases of a disordered stomach, a teaspoonful of salt is a certain cure. In the

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violent internal aching, termed cholc, add a teaspoonful of salt to a pint of water, drink it and go to bed; it is one of the speediest remedies known. The same will revive a person who seems almost dead from a heavy fall. In an apoplectic fit, no time should be lost in pouring down salt and water, if sufficient sensibility remain to allow swallowing; if not, the head must be sponged with cold water until the sense returns, when salt will completely restore the patient from the lethargy. In a fit, the feet should be placed in warm water, with mustard added, and the legs briskly rubbed; all bandages removed from the neck, and a cold apartment procured, if possible. In many cases of severe bleeding at the lungs, and when other remedies fail, Dr. Rush found two teaspoonfuls of salt completely stayed the blood. In tooth-ache, warm salt and water held to the part, and renewed two or three times, will relieve in most cases. If the gums be affected, wash the mouth with brine; if the teeth be covered with tartar, wash them twice a day with salt water. In swelled neck, wash the part with brine, and drink twice a day until cured. Salt will expel worms, if used in food to a moderate degree, and aids digestion; but salt meat is injurious if much used.

**PROPERTIES OF CHARCOAL.**

Charcoal is made by charring wood, whereby all watery and other volatile matter has been expelled by heat. It is black, brittle, light, and inodorous, and, not being decomposable by water or air, will endure for ages without alteration.

Among the many properties of charcoal may be mentioned its power of destroying smell, taste and colour; and as a proof of its possessing the first quality, if it be rubbed over putrid meat, the flavour will be destroyed. If a piece of charcoal be thrown into putrid water, the putrid taste or smell will be destroyed and the water rendered completely fresh. Sailors are aware of this; for when water is bad at sea they are in the habit of throwing burnt biscuits into it to purify it. Colour is materially influenced by charcoal and in numbers of instances in a very irregular way. If you take a dirty black syrup and filter it through burnt charcoal, the colour will be removed. The charcoal of animal matter appears to be the best for this purpose. You may learn the influence of charcoal in destroying colours by filtering a bottle of port wine through it; in the filtration it will lose a great portion of its colour and become tawny; repeat the pro-

cess two or three times and you have destroyed it altogether.

**PROPORTION OF A PERFECT HUMAN FIGURE.**

An entire human figure should be exactly six times the length of the foot; the face from the commencement of the hair above the forehead to the end of the chin, one tenth; the hand (measuring from the wrist to the tip of the middle finger) should be the same; the chest, one-fourth; and from the top of the chest to the highest point of the forehead, one-seventh. Let the length of the face, from the roots of the hair to the chin, be divided into three equal parts, the first will determine where the eyebrows meet, and the second the proper place of the nostrils. Of the human body, the navel is the central part, and if a man were to lie upon his back, with his arms extended, the periphery of the circle which might be described around him would touch the extremities of his hands and feet. The height from the feet to the top of the head should be precisely the same distance when the arms are extended sideways.

**THE LUNGS: HOW TO TEST AND STRENGTHEN THEM, ETC.**

The lungs are a hollow, spongy mass, capable of confining air and of being dilated by it. They are so situated in the thorax (or chest), that the air must enter into them whenever the cavities of the thorax are enlarged. The process of breathing is performed thus: When we inhale, the thorax is expanded, in consequence of which a vacuum is formed round the lungs, and heavy external air instantly enters (through the mouth and throat) to supply this vacuum. When we exhale, the thorax contracts again in consequence of which it can no longer contain the same quantity of air as it did before, and some of it is necessarily expelled. When this expulsion of air takes place, the lungs and muscular fibres of the wind-pipe and gullet contract in order to assist the process.

The following simple experiment is said to be a test for the soundness of the lungs: Let the patient draw in a full breath, and then begin to count as far as he can, slowly and audibly, without again inhaling the lungs. The number of seconds he can continue to be carefully noted. In confirmed consumption the time does not exceed eight, and it is often less than six seconds.

In pleurisy and pneumonia it ranges from nine to four seconds. But when the lungs are sound, the time will range as high as twenty to thirty seconds.

A simple and good method to strengthen the voice and lungs is to draw a full breath, and without again inflating, hitting the breast with both hands. This done regularly, upon rising every morning, is very good for the lungs.

On examination, the lungs will be found full of innumerable little holes, like a sponge. These holes are the cells into which the air enters when we breathe. So great is their number that they have been calculated to amount to 170,000, forming a surface thirty times greater than the human body. Every one of these cells is provided with a network of blood-vessels, by which means every portion of the blood is brought into immediate contact with the air. When this great amount is taken into consideration, we shall at once feel how necessary it is to apply pure air to the lungs with every breath we breathe.

#### CAUSE OF LEFT-HANDEDNESS.

Questions arise among anatomists whether the properties of the right hand, in comparison with those of the left, depend on the course of the arteries to it. It is affirmed that the trunk of the artery going to the right arm, passes off from the heart so as to admit the blood directly and more forcibly to the small vessels of the arm. For the convenience of life, and to make us prompt and dexterous, it is pretty evident that there ought to be no hesitation which hand is to be used, or which foot is to be put forward; nor is there, in fact, any such indecision. Is this taught, or have we this readiness given to us by nature? There is a distinction in the whole right side of the body, and that the left side is not only the weaker in regard to muscular strength, but also in its vital constitutional properties. The development of the organs of action and motion is greatest upon the right side, as may at any time be ascertained by measurement, or by the testimony of the tailor or shoemaker. Certainly, this superiority may be said to result from the more frequent exertion of the right hand; but the peculiarity extends to the constitution also, and disease attacks the left extremities more frequently than the right.

In opera dancers we may see that the most difficult feats are performed by the right foot. But their preparatory exercise better evince the natural weakness of the left limb, since these performers are made to

give double practice to this limb, in order to avoid awkwardness in the public exhibition; for if these exercises be neglected, an ungraceful performance will be given to the right side. In walking behind a person, it is very seldom that we see an equalized motion of the body; and if we look to the left foot, we shall find that the tread is not so firm upon it, that the toe is not so much turned out as in the right, and that a greater push is made with it. From the peculiar form of woman, and the elasticity of her step, resulting more from the motion of the ankle than of the hanches, the defect of the left foot, when it exists, is more apparent in her gait. No boy hops on his left foot, unless he is left-handed. The horseman puts his left foot in the stirrup and springs from the right. We think we may conclude that everything being adapted, in the conveniences of life, to the right hand—as, for example, the direction of the worm of the screw, or of the cutting end of the augur—is not arbitrary, but is related to a natural endowment of the body. He who is left-handed is most sensible to the advantages of this adaptation, from the opening of the parlour door to the opening of a penknife. On the whole, the preference of the right hand is not the effect of habit, but a natural provision, and is bestowed for a very obvious purpose; and the property does not depend on the peculiar distribution of the arteries of the arm, but the preference is given to the right foot as well as the right hand.

#### ON AVOIDING AND TREATMENT OF SUNSTROKE.

To avoid sunstroke it is well to place a sponge or cloth on the head; but workmen cannot well attend to this. Use two linings in the top of the hat. They may be of paper or cloth, one blue, the other yellow, and are worn as a covering in your hat. For a sudden remedy, as a substitute, use green leaves or a piece of silk. If possible also use a light umbrella. Tepid water prevents the rush of blood and will cool the system. When you find a case of sunstroke or apoplexy, as soon as possible apply water heated to from 110 to 115 degs. Use two or three pailsful. Pour it on in a small stream; let it fall a few inches, directly on the back of the head at the junction of the cerebellum with the spinal column, in or near the hair. Then set the patient up and rub dry. The warm water passes off over the cheeks. Then apply alcohol or stimulants to the neck and back of the head. It sun

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stroke and apoplexy, very hot water should be applied to the feet and ankles immediately (hot packs will do). This draws the blood from the head.

### IMPURE AIR IN CHURCHES.

Dr. B. Howard Rand, in an address to the students of the Pennsylvania Medical College, some years ago, amongst other outspoken remarks, said: 'There are hardly a dozen well-ventilated churches in the country, and many are but enlarged "black holes." Here the congregation sits, stupid and depressed from carbonic acid, taking in the poisonous emanations from the bodies of hundreds around. Thousands of unconscious martyrs have thus gained their souls' salvation by their bodies' death.'

### SERIOUS EFFECTS OF VITIATED ATMOSPHERE.

Vitiated atmosphere is productive of the most horrible effects. The following are a few of the many examples that might be cited in proof of this assertion:

In the year 1756, during a rebellion in India, one hundred and forty-six persons, chiefly English, Dutch, and Portuguese soldiers, were imprisoned by the natives in the Black Hole of Calcutta, which was nothing more nor less than a room eighteen feet square, and about sixteen feet high, and furnished with two grated openings on one side for the admission of light and air. During a confinement of twelve hours one hundred and twenty-three perished, and the remainder were subsequently attacked with 'putrid fever,' which is said to have proved fatal in most of the cases.

In the year 1797 or '8, during a storm at sea, seventy men, women and children were kept for a short time in the hold of a small vessel, the hatches of which had not only been 'laid over,' but for better security, 'battened down.' The death of the entire number was the result. In December 1848 also during a storm, one hundred and fifty passengers were enclosed in the same hermetical manner, in the steerage cabin of the steamer Londonderry, while on its passage from Liverpool to New York. Soon half the number perished by suffocation, and it is very probable that the rest who have speedily met with a similar fate, had it not been for the strength of one man who succeeded in bursting open the door of the companion-

way, although the captain of the steamer had taken especial pains to prevent such an occurrence.

The following are a few examples to illustrate the importance of a thorough system of ventilation, in cases where little if any complaint has been previously made of inattention to this hygienic measure: There was once in Glasgow an assemblage of buildings attached to a factory, which were occupied by about five hundred persons—one family to each room. There had long been a great deal of sickness in the buildings, which the inmates seemed to regard as a mysterious dispensation of Providence, for they obstinately refused to adopt such sanitary expedients as had been repeatedly advised them. At length the proprietors of the establishment, despairing of ever making the inmates appreciate the necessity of occasionally opening windows, resolved to apply a system of ventilation which should be thorough, continual, and utterly beyond the control of those subjected to it. They accordingly connected each room, by means of tubes, with the chimney of the factory furnace, and compelled every occupant, whether willing or unwilling, to be exposed daily and nightly to draughts of air. The result was that sickness of every kind rapidly diminished, and one disease—typhus fever—which has frequently raged as an epidemic, was for eight years 'scarcely known in the place.'

In 1832, at Norwood School, in England, scrofula made its appearance among six hundred children and destroyed a great number of them. The disorder having been attributed to an insufficiency and bad quality of food, a scientific investigation was made and a decision given that the food was 'most abundant and good'—that 'defective ventilation and consequent atmospheric impurity' was the cause of the sickness. A thorough system of ventilation was immediately applied; scrofula rapidly disappeared, nor did it ever recur, though the number of the pupils was gradually increased to eleven hundred.

In a hospital at Dublin, two thousand nine hundred and forty-four deaths took place in four years. A better system of ventilation having been resorted to, as a means of lessening the mortality, it was found that during the next four years the number of deaths was only two hundred and seventy-nine.

Marshy places, stagnant water, defective sewerage, bone-boiling districts, and offal grounds, it is almost needless to add, breed fever and ague and malarial fevers, which often-times last a person's lifetime, coming

on as together as the seasons. Physicians may prescribe, but the best cure is breathing a purer atmosphere by removing from the place.

The above facts are merely selected from a long array of similar character, which tend to show the paramount importance of breathing an untainted atmosphere. It is certainly no exaggeration to say that were the public as particular as they should be, and easily might be, about the quantity of that subtle fluid which enters and departs from an average pair of human lungs about a thousand times in an hour, and nearly nine million times in a year, the bills of human mortality would be reduced one-third at least, and the ordinary duration of human life be nearer seventy than forty.

#### FACTS ABOUT AIR.

Out of a series of articles on strength and health, by the late Dr. G. B. Winship, we republish the following:

The ocean of air which encircles our globe to a supposed elevation of nearly fifty miles, is kept wholesome by a stupendous system of circulation, which tends to diffuse to a harmless extent whatever would be deleterious. The purest atmosphere ever at our disposal contains something which is innocent only from its extreme dilution, its minute relative quantity. Carbonic acid, for instance, is perfectly harmless if it does not constitute more than one five-hundredth of the air we breathe; but it is decidedly injurious if it amounts to one per cent., and deadly if to five.

It is this gas which is often found at the bottom of wells, cisterns, and empty beer-vats, and which has proved so suddenly fatal to those persons who, through carelessness or ignorance, have descended into such places without having first lowered into them a lighted lamp, to see if it would continue to burn. It is a chemical combination of one volume of carbon with two of oxygen, and is a constant product of fermentation, putrefaction, and all ordinary combustion, particularly that of charcoal. It is constantly issuing from the lungs and skin of every animal, and from plants, although they absorb it during the day, emit it freely during night.

It is this gas which makes spring water so sparkling and palatable, and it is the absence of it that makes boiled water so insipid. But however grateful it may be to the stomach, it is so exceedingly obnoxious to the lungs, that every care should be taken to

breathe as little of it as possible. Hence the importance of thorough and constant ventilation, which will never fail to give it such diffusion as the requirements of health will demand.

Apartments which are underground, or otherwise so situated and contrived as to favour an accumulation of this gas, may be easily kept free from an undue quantity of it by occasionally washing the walls with a strong solution of caustic lime, which readily enters into union with the gas, resulting in the formation of the harmless substance, common chalk.

I have now mentioned two grand methods of getting rid of one of the invisible foes of human health, which may be found lurking in the atmosphere; but here is another five times more deadly—carbonic oxide, a chemical combination of one volume of carbon with only one of oxygen. Prof. Higgins, of Dublin, desirous of ascertaining if any one of its effects were similar to those of nitrous oxide, on being inhaled, prepared some for the purpose; and in the presence of a few scientific friends, took three or four inspirations of it; he then fell suddenly to the floor, remained totally insensible for a half hour, and was only revived by having pure oxygen forced into his lungs. But for several days he continued alarmingly ill, afflicted with vertigo, shivering turns, convulsive agitations and excruciating headaches. Sir Humphrey Davy tried the experiment, modified by diluting the gas with twenty-five per cent. of common air, but he underwent an almost precisely similar train of symptoms. It is not less fatal to the lower animals than to man. A French chemist ascertained that air containing four or five per cent. of it, could prove instantly fatal to a sparrow, and one per cent., in two minutes to a fowl.

This gas is a product of incomplete combustion, particularly that of charcoal. Hence the double danger in a close room, of having a charcoal fire, or of allowing a candle, or lamp, or gas-light to smoke. Unlike carbonic acid, it will not form a precipitate with lime, but it is important to know, that in a free circulation of air it may not be generated; and that if it is, it will be a restricted amount. Yet this circumstance should not make us less mindful of the utility of a chimney or funnel so arranged as to ensure the rapid and complete removal from an apartment of so deleterious a substance.

#### IN AND OUT-DOOR AIR.

When a small portion of the air of a

crowded room distilled water contains various portions of its particles, with a scale, or they adhere to various forms of sand and other matter, than that the particles are ruptured by mechanical chambers, by ssemblies, or every breath a monster life. for a few hours there be treated will be found few fibres of fungus, but human hair, a ter.

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#### AIR PRESSURE

Dr. W. H. S. Physical Society experiments on man lungs during instruments. A thirteen pound tube was inserted the lips were a piece, as in order pressure of inches invariably expiratory power was exhausted were sufficient to chestal tone; pressure of from inch; and the elastic bassoon, seven

crowded room is made to pass up through distilled water, a sediment is left which contains various coloured fibres of clothing and portions of hair, wool, bits of human skin or scales, with a kind of fungus growth, with its particles of reproduction, which adhere wherever they strike or fall on wet surfaces, or bruises, or sore places, and grow wherever they adhere. There is also a small amount of sand and dirt, with great numbers of the various forms of animal life. No wonder, then, that the blood is soon tainted and corrupted by making sitting apartments of our chambers, by spending hours in crowded assemblies, or stage-coaches, or rail-cars, where every breath we draw is a mouthful of monster life. But if that room be emptied for a few hours, and a portion of its atmosphere be treated in the same way, nothing will be found but a little sand and dirt, a few fibres of wool and cotton, only a trace of fungus, but no animal life and no bits of human hair, and scales of dead human matter.

In our close apartments we are surrounded with organic living bodies, and thus animal matter living, dead and decayed, loads the atmosphere which we breathe in the chambers of our dwellings and crowded rooms, so that these corrupting particles are swallowed, and are breathed into the system every moment of in-door existence, thus strongly urging us, by all our love of pure blood and high health, to hurry from our chambers at the earliest moment in the morning, and to consider every hour of out-door breathing a gain of life.

#### AIR PRESSURE IN WIND INSTRUMENTS.

Dr. W. H. Stone, in a paper before the Physical Society of London, describes some experiments on the wind pressure in the human lungs during performance on wind instruments. About six feet of water, or thirteen pounds pressure per square inch, was the ordinary maximum when a small tube was inserted between the lips. When the lips were supported by a capped mouth-piece, as in brass instruments, a much greater pressure could be sustained, and lip-instruments invariably gave way long before the expiratory power of the thoracic muscles was exhausted. The following pressures were sufficient to produce and average orchestral tone: The oboe requires an air-pressure of from five to ten ounces per square inch; the clarinet, eight to fourteen ounces; bassoon, seven to fourteen ounces; horn,

two and a half to five ounces; cornet, five to eighteen ounces; trumpet, seven to eighteen ounces; euphonium, one and a half to twenty-three ounces; bombardone, one and a half to twenty ounces. Most of the pressures are small, not exceeding, or indeed attaining the pressure of a fit sneezing or coughing. They are, therefore, very unlikely to injure the lungs.

#### CURES, PRESCRIPTIONS AND PREVENTIVES FOR VARIOUS AILMENTS, ETC.

**RHEUMATISM.**—One pound Spanish sarsaparilla, two ounces gum guaiacum, two ounces iodide potassia. Boil sarsaparilla and guaiacum with one gallon of water, strain, till it becomes one half gallon, strain, and when cold add potassia in the liquid. Bottle and keep it in a cold place. Sweeten to taste with molasses. A wine glassful one hour previous to each meal and on retiring. If in habit of drinking, use nothing but Holland gin.

It is customary for some people in Ireland to cure a raw-potato or horse-chestnut in the pocket for a cure for rheumatism.

For rheumatism boil in a quart of water two ounces of bayberry bark and a quarter of an ounce of ladies' slipper. Having strained add a drachm and a half of tincture of guaiac, with a half spoonful cayenne pepper; this sweeten. A fourth part to be taken morning and night. Impart to be hand-rubbing a gentle friction to the affected parts. Then apply soapliniment; to every ounce of which previously add forty drops of tincture of cantharides. A footer times protect with flannel bandages.

Those who eat plenty of mustard are seldom troubled with rheumatism.

Sulphur vapour baths are taken with great benefit for rheumatism; ironing the affected part with a hot iron as hot as can be borne without burning, will often cure this complaint at the outset.

**DIARRHŒA, DYSENTERY AND CHOLERA.**—The *N. Y. Sun* remedy for cholera is as follows: Take equal parts of tincture of laudanum; tincture cayenne pepper, treble strength; tincture rhubarb; essence of peppermint, treble strength; spirits of camphor; mix in a bottle; dose from 5 to 30 drops, according to violence of symptoms. To be repeated in 10 or 15 minutes if needed.

In severe cases of diarrhœa take the following: 10 grains gum camphor and 5 grains opium; make into five pills, and take one every hour until checked.

Burnt brandy, prepared by throwing a lighted paper into the brandy, while boiling on the stove, and while it blazes, holding over that a piece of white sugar, is an excellent drink for bowel complaints.

A teaspoonful of grated saug, mixed with about the same proportion of milk, is given in diarrhœa.

A teaspoonful of pulverized ginger, dissolved in a wine-glass of good gin, is good for cramps and looseness of the bowels.

Peppermint tea is also good for diarrhœa.

A cup of hot milk will often cure dysentery; if that does not act, mix a little flour with it. In extreme cases, hot milk and plaster of Paris

are given, but this last should never be taken without first consulting a good physician.

Take a cupful of flour, empty in a bag, tie up and place in a bowl of water, with a little water, and let it boil four or five hours, after which remove the outside dough and grate the hard substance remaining; then mix with milk or water and administer as food in cases of dysentery.

**THROAT AFFECTIONS.**—For diphtheria take a live coal of either wood or anthracite, on which drop tar, and let the smoke arise place over it the bowl of a common clay pipe and inhale the same, allowing the smoke to pass through the mouth and out of the nostrils. Let this be done every hour until the membrane is utterly destroyed, which has, under the treatment, never failed to be the case. In connection with this, let the physician prescribe the usual dose of chlorate of potash, to be dissolved in a tumbler of water, a teaspoonful of which must be frequently taken.

Great relief in diphtheria is said to be found by placing cayenne pepper in the sharpest vinegar, and dropping in live coals and inhaling the steam from a cup. It gives the strength to throw up the detached membrane, besides affording great relief in breathing.

An administration of four drops of pure sulphuric acid in a tumbler of water is an Australian remedy for diphtheria.

A gargle of salt and water is among the best of remedies in ordinary sore throat, slight bronchitis, hacking cough and hoarseness.

Men subject to affections of the throat or neck will do well to let their beards grow in winter time.

**DYSPEPSIA.**—Bruised rhubarb, quarter ounce; bruised canella, one-eight ounce; bruised ginseng, half ounce; bruised columb, quarter ounce; alcohol, one quart. Let it stand one week in a warm place, strain, take a tablespoonful night and morning in a wine glassful of water.

Another remedy for dyspepsia is: A decoction of hoarhound, tansy, boneset and wormwood, with saleratus dissolved in each dose, as much as will lie on a silver half dime, taken in doses of a small wine glassful before each meal.

To assist digestion take two parts white Castile soap, one part ipecac, and, mixed with mucilage of gum arabic, make ordinary pill, taking one three times a day before each meal.

Prepared chalk will save the dyspeptic patient from much distressing sickness. Eat a small piece whenever the stomach feels uneasy and uncomfortable.

Wine of pepsin is the antidote given by physicians for dyspepsia.

**CONSUMPTION.**—Consumptives have found bullock's blood the only thing to keep them alive. Bourbon, lime water, cream and brandy, port wine and Scotch ale are all first-rate.

Slippery elm bark, to be chewed, is given for consumptives, more especially those subject to hemorrhage.

Extract of malt, mares' and asses' milk are all given to build up the system of invalids.

Hemorrhage of the lungs may be stopped by throwing a handful of salt in the mouth.

**FEVER AND AGUE.**—Watermelons, canned oysters and vinegar are safeguards in districts subject to ague.

For fever and ague take the following: 30 drops spirits of hartshorn, 20 drops of laudanum, and about a gill of old Jamaica rum, diluted with about half a pint of hot water, to be taken immediately on the approach of a chill, the patient retiring to bed, and using plenty of covering. Be careful not to take cold afterwards.

Another remedy for fever and ague: Qu-

line, 1 scruple; oil black pepper, 10 drops; powdered rhubarb, 10 grains; make 25 pills. Take one every two hours between the attacks, and continue for a few days after the chills are broken.

**STINGS AND BITES.**—Wash the wound with water of ammonia, or a solution of chloride of lime. If the bite is very poisonous, in addition to the above, cauterize it with lunar caustic. Bites of dogs supposed to be mad have been successfully treated in this way. For the bite of a snake, where no other remedy is at hand, let the patient be made deadly drunk as soon as possible; this will save life upon the principle of the greater poison counteracting the lesser one. For hydrophobia a new remedy has been discovered lately in France. The drug is called cedran. It is said to counteract the bite of the rattlesnake.

**LOCKJAW.**—When one runs a nail or sharp iron in any part of the body, take a common smoke-pipe, fill it with tobacco, light it well, take a thin cloth or silk handkerchief, place it over the bowl of the pipe, and blow the smoke through the stem into the wound; two or three pipefuls will be sufficient to start the wound discharging. If the wound has been some days standing, it will open again if the tobacco be good.

**THE TEETH.**—The teeth may be easily and safely freed from discoloration by patiently rubbing them once a month or six weeks, but not oftener, with the end of a little, hard wooden stick, previously dipped in a composition of sweet-oil and powdered, unadulterated myrrh or orris root. Never pick the teeth with a metallic substance.

**TOOTHACHE.**—Hops, steeped in Jamaica rum, will relieve toothache or neuralgic pains. They should be applied hot.

Moisten a little cotton in a solution of gum copal and chloroform, and place it in the hollow of the decayed tooth.

Cresote is used as a caustic, and burns away the mortified bone or ulcer formed upon it, which produced the pain.

**FETID BREATH.**—The juice of strawberries, without any previous preparation whatever, dissolves the tartarous incrustations on the teeth, and makes the breath sweet and agreeable.

Toast water is recommended for fetid breath. **THE EYE.**—The inflammation can best be taken from a black eye by applying a raw oyster.

For weak eyes nothing is better than bathing them in a running stream, keeping the eyes open at the time.

Styes on the eye may be removed by dipping a small brush in alcohol and painting the stye.

**EARACHE.**—This may be cured by taking a small piece of cotton-wool, placing ground pepper in it, then gathering it into a ball, trying it up, after which dip the ball into sweet oil, and insert it into the ear. Use a bandage to retain it in its place.

**THE NOSE.**—Catarrh may be relieved by snuffing salt and water.

A stone held at the back of the neck will frequently stop bleeding of the nose.

**PILES.**—Take a nutgall, pound, and finely pulverize it, mix it with enough lard to make it into a salve. One application is generally sufficient.

**WOUNDS.**—To prevent wounds from mortifying, sprinkle sugar on them. The Turks wash fresh wounds with wine and sprinkle sugar on them. Obstinate ulcers may be cured with sugar dissolved in a strong decoction of walnut leaves.

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A good method to heal a cut is to glue it up with paper on which the hot glue has been spread.

**COUGHS AND COLDS.**—Onion syrup, made from the juice and sweetened, is excellent. Wild Cherry Pectoral is also good.

**Hiccoughs.**—May be stopped by suddenly catching or violently shaking the person affected, unless brought on by drunkenness.

**PRICKLY HEAT.**—For nettlerash or prickly heat, wash the parts affected with sulphur soap or vinegar and salt.

**WARTS.**—To remove warts take a leaf of house-leek, peel it, and bind it upon a wart before going to bed. In the morning the wart will be softened to such an extent that half of it may be pulled off. Repeat the application for two or three nights and the excrescences will disappear, leaving no marks behind.

Warts may be cured by rubbing them with common solid potash.

**BURNS.**—Linsed oil mixed with lime water is very efficacious for burns, when applied with a feather. Wash the burn three times a day with warm milk and water, and renew the oil dressing each time.

**CORNS.**—Pare down close and keep moistened with sweet oil.

**TONICS.**—Gentian root and ground allspice make one of the tonics. Camomile flowers are also good.

**BILIOUSNESS.**—Cockle's and Triplex pills are recommended for biliousness; also lemon juice and light diet.

**ERYSIPELAS.**—A poultice made of cranberries, pounded fine, and applied in a raw state, has proved in many cases a certain remedy for erysipelas.

**DANDRUFF.**—Powdered borax dissolved in water is the best known remedy for removing dandruff, using with it a little soap.

**FRECKLES.**—To remove freckles dissolve a little magnesia in soft water, beat it to a thick mass, spread it on the face, let it remain a few moments, then wash off with Castile soap and rinse with soft water.

**FEVER SORES.**—For fever sores or eruptions on the skin produced by cold, change of diet, etc., apply camphor ice.

**DISINFECTANT.**—Oil of vitriol, the salts of zinc, and charcoal are the most active for neutralizing the foul odours originating from putrid matters.

**POISONS.**—For the neutralization of various poisons administer as follows: Soda and magnesia after acids; the whites of eggs, lime water or charcoal after arsenic; soap and water after corrosive sublimate; soda or lime after Prussic acid; milk and water after white vitriol; a solution of common salt after nitrate of silver.

A large teaspoonful of mustard mixed in a tumbler of warm water and swallowed will produce vomiting.

**NERVOUS AFFECTIONS.**—A sick headache may sometimes be relieved by looking steadily for two or three minutes at a piece of green baize, green silk, or other green material.

For nervous affections of the head or spine, salt water bathing or sponging the head and spine with water and rock salt.

A sick or nervous headache may often be cured by throwing cold water over the feet a few times.

**DERANGED STOMACH.**—For a deranged stomach, from dissipation or over-eating, take a small quantity of baking-powder.

**STRENGTH; AND HOW TO ATTAIN IT.**

DR. G. B. WINSHIP'S METHOD.

As thy days, so shall thy strength be.

Heavy-lifting was commenced by the late Dr. George Barker Winship in August, 1855, when in his 22nd year, beginning with 400 lbs. He continued the practice daily until the close of the year, at which time he lifted 700 lbs. On the 12th of May he lifted 929 lbs., and on the 15th of December of the same year, 1,032 lbs.; on the 18th of January, 1,133 lbs.; and on the 10th of May following, 1,208 lbs. This is the heaviest that he has lifted with his hands. The Doctor's height was 5ft. 7in., and he weighed but 142 lbs. His mode of lifting was as follows: He sank a hoghead in the ground, and in the hoghead a barrel. A rope, with a transverse bar at the end, was then lowered to the bottom of the barrel. Then stones and gravel were thrown in until a weight was obtained of between 400 and 500 lbs. Another cross-bar at the upper end of the rope gave him his handle for lifting. Then standing astride of the hoghead, and holding the handle with one hand before him and the other behind, he raised the barrel some five or six inches from the bottom of the hoghead.

The next day he added a few pounds to the weight, and the next a few pounds more, and thus he advanced very gradually, day by day, until at the end of the year 700 lbs. had been reached.

He commenced the use of dumb-bells in the summer of 1858, having provided himself with two weighing 50 lbs. each. His first achievement with them, was to raise them alternately as high as he could above his head; his second to raise them both at once in the same manner. As an accompaniment to these feats of daily practice, he attempted to hold them out at arms-length—one in each hand. To do this fairly and satisfactorily, required several months of practice; but he contented himself with the thought that a daily gain, however slight, would eventually terminate in success. By the spring of 1859, he was able to raise two dumb-bells weighing 100 lbs. each alternately above his head. Soon afterwards he conceived the desire of putting up the heaviest dumb-bell on record. Procuring two 68 lb. pound shells, he had them fitted on the screw principle to a wrought-iron handle. This expedient provided with a dumb-bell weighing 141 lbs., and capable of being increased to 180 lbs. by the simple process of

pouring shot into the cavities of the shells, after having first separated them from the handle. A few weeks practice enabled him holding the dumb-bell in one hand at the shoulder, to give it the requisite elevation, and one year's practice, to do the same with the instrument loaded to its full weight. The effect of this dumb-bell practice was to add depth to the upper region of the chest, and to give the shoulders a kind of spread they could not have got, [perhaps,] by any other means—the practice with the loaded barrel, or with the yoke and chains and heavy weight connected, excepted.

In March, 1859, he provided himself with a new and more elaborate apparatus for his experiments. It consisted of two trestles, a platform, ten iron disks averaging a little more than a hundred pounds each, an iron shaft passing concentrically through them, and a hook and chain to form the connection between the shaft and handle.

Exchanging the round handle which he had hitherto used for an oval one, before the summer of 1859 he increased his lifting power to 1,000 lbs. This oval handle was subsequently laid aside for a scooped one, with which 1,100 lbs. was reached in the fall of 1849; then a triangular handle was substituted, and this was an improvement on all its predecessors, and with it 1,208 lbs. was reached in the spring of 1860.

He soon after tried a new mode of lifting. This was by means of a padded rope over his shoulders, his body during the process of lifting being steadier and partly supported by his hands grasping a stout frame at each side of him. The weight received the addition of an eleventh disk, and then of a twelfth, this last having a circular depression on its upper surface near its edge, designed for the reception of the hooked ends of iron appendages, 50 of which were cast for the purpose, weighing 25 lbs. each, and which were to be 'hung around' the disks as his lifting power increased.

Between that time and 1861 the weight lifted had been increased to nearly 2,200 lbs.; but during this interval the rope was abandoned for a leather band, that for a padded chain, and that for a wooden yoke fitting across his shoulders, and having two chains dependent from it, the lower ends of which connect with a swivel which is mounted on a screw in communication with the weight.

The object of the swivel and screw will readily suggest itself as a means of lengthening or shortening at pleasure the distance between the weight and his shoulders.

At a gymnastic tournament at Bryan Hall, Chicago, in February, 1861, \$200 were offered to be competed for in heavy lifting.

The weight to be lifted consisted of kegs of nails, each weighing 100 lbs., arranged in a sling of ropes, and suspended from a high platform. The only competitors were the Doctor and Mr. Thompson of the Metropolitan Gymnasium. The first weight lifted by each was 9 kegs, weighing, with the connections, about 1,000 lbs. The second, 10 kegs, weighing 1,100 lbs., was lifted with apparent ease by the Doctor. Mr. Thompson attempted so to lift it several times, but failed and gave it up. These weights were lifted by main strength of arm.

The Doctor then put on his harness, consisting of an iron chain passing over the neck, and lifted about 1,500 lbs. Upon a second attempt, the hook to which he fastened his chain was found to be broken, and it became impossible for him to proceed, as he could not adjust it to his height. The harness which Mr. Thompson used was of a different description, bringing the strain upon the hips, instead of the shoulders and back, as in the case with the Doctor, thereby rendering a person capable of supporting a much greater weight. This harness not fitting the Doctor, owing to the disparity of the two in size, he declined any further attempts under a disadvantage, and Mr. Thompson proceeded by degrees until he had lifted 2,100 lbs. The Doctor expressed his entire confidence that, with a harness of a similar description, he could lift 2,500 lbs., and that he had found none yet who could lift over 1,200 lbs in his style. [Dr. Winship subsequently with harness lifted 2,600 lbs. in Boston, Mass.]

In addition to lifting, the Doctor displayed his wonderful strength of arm and hand by suspending himself from the round of a ladder for a considerable length of time by his little finger. He also lifted and shouldered a barrel of flour, which had been provided, weighing 229 lbs., being some 15 lbs. heavier than ordinary barrels to which he was accustomed.

#### R. A. PENNELL'S SYSTEM.

Mr. Pennell, who is said to have lifted the heaviest dumb-bell on record, viz: 210 lbs., at the Metropolitan Police Gymnastic Exhibition in New York, July 23, 1877, commenced practice when about seventeen years of age with a 35 lbs. dumb-bell; in six weeks after he could handle a 100 lb. bell, and at the end of the year one weighing 165 lbs. His business then not allowing daily exercises at lifting heavy-weights he desisted from the practice for three years, but upon resuming and after two weeks' exercising he

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#### COMPARISON OF THE STRENGTH OF THE ARM AND HAND OF THE EUROPEAN AND THE AMERICAN.

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was able to put up a 200 lb. bell. His putting up a dumb-bell weighing 201½ lbs. on January 31, 1874, is an undisputed fact. He has held up a 180 lb. bell and walked across a large room with it, and on the occasion of his 210 lb. lift, he informed us, that he held a 56 lb. weight in his left hand at the same time. The bell used was a shell capable of being loaded to 350 lbs., the property of Prof. Miller, at present Superintendent N. Y. Police Gymnasium.

COMPARISONS BETWEEN THE CIVILIZED AND UNCIVILIZED.

Kalmucs, Arabs and other inhabitants of deserts or open plains, can perceive very minute objects at a distance perfectly astonishing to a European. The same people by laying themselves on the ground and applying the ear close to the soil can distinguish the very remote trampling of horses, the noise of an enemy, of a flock of sheep, or even of strayed cattle. The sense of smelling is of corresponding acuteness. On their military expeditions they can detect the smell of a camp or of a fire long before any of his senses would convey such information to a European. Savages have much stronger powers of mastication than their civilized brothers.

The experiments of M. Peron on savages of different nations, with the dynamometer, are sufficiently interesting and curious to have their results briefly stated. The dynamometer is an instrument designed for the purpose of measuring the quantity of force exerted by men or animals. The instrument employed consisted of an elliptical spring one foot long and rather narrow, covered with leather that it might not injure the hand that compressed it. The strength of the spring was such as to exceed that of any animal to which it might be applied, and it contained a mechanism with an index which indicated the quantity of the power by which the spring was compressed. The following were the results of the manual power expressed in French kilogrammes :

Van Dieman's Land .....	50.6
Australia .....	51.3
Timor .....	53.7
French .....	62.2
English .....	71.4

The strength of the loins, in French myriagrammes :

Australia .....	14.8
Timor .....	18.2
French .....	23.1
English .....	23.8

Exercise alone accounts for the difference in acuteness of the savage and civilized race, the physical faculties of the two races having just that degree of power, not less nor more, which their respective circumstances have called forth. The circumstances of the savage are such as to require the utmost exertion of the organs of sense—hence his animal superiority; those of the civilized demand the exercise of the mental powers, and hence his superiority in all that distinguishes the human from the brutal nature.

We fear, although it may be easy to find the difference of power between one and another in some particular developments of strength, it must be extremely difficult to form a true estimate of the aggregate difference. One man is stronger than another in the legs; another in the arms; one man can drag a great weight after him; another can haul a rope with force, and another can carry a heavy load upon his head or back. Some, again, who have been much accustomed to labour, are capable of immense exertion for a short period, but are quite unequal to the moderate but continuous exertion in which others find no difficulty. And so, generally, it is less perhaps in aggregates of power that men excel one another, than in some particular developments. As an instance, the Arabs, who can see objects of great distance, do not compare with the European in the perception of near objects. However, the law of adaptation in man's external and internal organization, enables him to subsist on all aliments, and to bear all modes of life. The savage's mode of living is as congenial to his nature as the civilized man to his.

REMARKABLE FEATS OF MUSCULAR STRENGTH.

Milo, a celebrated athlete of Crotona in Italy, accustomed himself to carry the greatest burdens, and by degrees became a monster in strength. It is said that he had carried on his shoulder an ox four years old, weighing upwards of 1,000 lbs., and afterwards killed him with a blow of his fist. He was seven times crowned at the Pythian games, and six at the Olympic. He presented himself the seventh time, but no one entered the lists against him. He was one of the disciples of Pythagoras, and to his uncommon strength that preceptor and his pupils owed their lives. The pillar which held up the roof of the house suddenly gave way, but Milo supported the roof of the building, and gave the philosopher time to escape. In old age he attempted to pull up

a tree by its roots and break it. He partially effected it, but his strength being gradually exhausted, the tree, where the cleft was, reunited and left his hand pinched in the body of it. He was then alone, and, unable to disengage himself, died in that position.

Haller mentions that he saw a man whose finger caught in a chain at the bottom of a mine; by keeping it forcibly bent, he supported by that means the whole weight of his body, 150lbs., until he was drawn up to the surface, a distance of 600 feet.

Augustus II, King of Poland, could roll up a silver plate like a sheet of paper, and twist the strongest horse-shoe asunder.

A Turkish porter will trot at a rapid pace, and carry a weight of 600lbs.

Captain Barclay, the famous Scotch pedestrian, could lift with his hands a weight of 1,050lbs.

Eckeberg, 'The German Samson,' could sustain a cannon, said to weigh 2,000lbs.

Topham on May 28, 1741, lifted three hogheads of water, said to weigh with the connections 1,836lbs., in London, Eng.

McGregor on Oct. 9, 1762, felled a bullock by a second blow of his unprotected fist in Kelso, Scotland.

R. A. Pennell put up a dumb-bell weighing 204lbs., Jan. 31, 1874.

John M. Cannon on Jan. 16, 1875, lifted 1,250lbs. with his hands, health-lift machine.

W. B. Curtis, with harness, is accredited with lifting 3,300lbs., New York.

Ambrose A. Butta is said to have lifted at Auburn, O., 2,737lbs. with harness.

John J. Lucas has the credit of having lifted 2,700lbs. at Belleville, Ill., on Oct. 26, 1875, with harness.

Dr. G. B. Winship is reported lifting with harness 2,600lb. at Boston, Mass.

W. B. Curtis, hand-lift, 1,230lbs.

Dr. G. B. Winship, hand-lift, 1,200lbs.

John Vail could lift a blacksmith's anvil with his hair or teeth.

Fred. Canfield could break an inch rope by pulling on it.

Mons. Gregoire used to break large paving stones by blows of his fist.

Mons. Paul won a wager of \$500 by successfully resisting the draught of two powerful horses.

D'Omer can cut in two a silk handkerchief thrown up in the air by one blow of his sword. He can also cut in two a suspended leg of mutton by one sweep of the sabre.

The same man in addition to the above feats, which he is constantly performing before the public, cuts an orange in two placed on another persons neck by one cut of his sword,

and in the same manner severs an 1½ inch bar of lead.

Tom Hyer has knocked down a bullock with one blow of his fist.

Mons. Buisley would hold up a cannon weighing over 700lbs. while it was being fired off.

Mons. La Thorne in his day used to throw a cannon ball weighing 60lbs. thirty feet in the air, and allow it to fall on the back of his neck.

Dr. G. B. Winship lifted twelve gentlemen weighing collectively, with the apparatus lifted with them; a little more than 2,000lbs. He could also lift a barrel of flour with his little finger, or raise his body in the same manner so as to bring his chin several inches above the finger.

Prof. Harrison of London, could lift 70lbs. with his little finger, and swing a pair of 47lb. clubs with ease.

Miss Cora suspends by her knees from a trapeze, and by means of a rope, one end of which is held in her mouth, and the other attached to a belt around the waist of the gymnast M. Austin, holds the latter up in the air, and at the same time fires off two pistols, one in each hand. Similar feats of strength and daring are now performed all over the world.

Fred. Cavill, on the 20th of August, 1877, started from Cape Griznez, France, at 4 o'clock, p.m., and swam across the English Channel to Dover, Eng., less about fifty yards, which place he reached at 3.45 a. m. the following day.

Capt. Matthew Webb swam across the English Channel, from Dover, Eng., to Calais, France—35 miles—in 21 hours, 45 minutes, August 24th and 25th, 1876.

Mr. Pennock put up a 10lb. dumb-bell 8,431 times in 4 hours and 34 minutes, Dec. 13, 1870.

R. A. Pennell lifted with his hands on a health-lift machine, 1,250lbs. Jan. 16, 1875.

R. A. Pennell is said to have put up a 210lb. dumb-bell, N. Y. Police Gymnasium Exhibition, July 23, 1877.

David Dorian used to elevate a 150lb. bell above his head.

William Miller has put up two 115lb. bells, one in each hand. The same gentleman also raised two 100lb. bells, one in each hand, ten consecutive times. These feats were performed at the Olympic Club, San Francisco, Cal., while practising dumb-bell lifting there.

Patrick Kelly raised a dumb-bell weighing 165lbs. with one hand from the floor up above his head, full length of arm.

## MUSCLE

The muscles of the human body consist of a thin, are uncoiled and in a state of contraction. The will, muscles. owing to the fact that they act in called ant

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MUSCLE: AND HOW TO DEVELOP IT.

The muscles are the organs of motion, consisting of fibres, or bundles of fibres, inclosed in a thin cellular membrane. The muscles are susceptible of contraction and relaxation, and in a healthy state a part of the muscles are subject to the will and are called voluntary muscles. But others, as the heart, the urinary bladder, and stomach, etc., which are of muscular texture, and susceptible of contraction or dilatation, are not subject to the will, and are therefore called involuntary muscles. The red colour of the muscles is owing to the blood-vessels which they contain. The ends of the muscles are fastened to the bones which they move, and when they act in opposition to each other they are called antagonists.

ON LIGHT GYMNASTICS.

Could we have an unbroken succession of good news, we might all have good digestion. But in a world of vexation and disappointment we are driven to the necessity of studied and unusual muscle-culture and other hygienic expedients to give the nervous system that support and vitality which our fitful surroundings deny. If we would make our muscle-training contributive in the highest degree to the healthful elasticity of our nerves, the exercise must be such as will bring into varied combination and play all our muscles and nerves. Those exercises which require great accuracy, skill, and dash, are just those which secure this happy and complete intermarriage of nerve and muscle. A man may stand still and lift kegs of nails and heavy dumb-bells till his shoulders and arms are Samsonian; but it will contribute far less to his health and longevity than a daily run of a mile or two. Speaking in a general way, those exercises in which the lungs and heart are made to go at a vigorous pace, are to be ranked among the most successful. The 'double-quick' of the soldier contributes more in five minutes to his digestion and endurance than the ordinary drill in two hours. An elastic tone of the nervous system is the physiological purpose of all physical training. We exercise our muscles to invigorate the thoracic and abdominal viscera. These, in their turn, support and invigorate the nervous system. All exercises which operate more directly upon these internal organs—as, for example, laughing, deep breathing, and running—contribute most effectively to the stamina of the brain and nerves. It is only the popular mania or monstrous arms and

shoulders that could have mised the intelligent gymnast on this point.

All persons, of both sexes, and of every age, who are possessed of average vitality, should, in the department of physical education, employ light apparatus, and execute a great variety of feats which require skill, accuracy, courage, presence of mind, quickness of the eye and hand—in brief, which demand a vigorous and complete exercise of all the powers and faculties with which the Creator has endowed us; while deformed and diseased persons should be treated in consonance with the philosophy of the Swedish movement cure, in which the movements are slow and limited.

In dumb-bell exercises, the pupil, assuming various positions, twists the arms. In each twisting the ends of the dumb-bells should, if possible, be exactly reversed. Great precision will sustain the interest through a thousand repetitions of this or any other exercise. The object in these twisting exercises is to break up all rigidity of the muscles and ligaments about the shoulder-joint. To remove this should be the primary object in gymnastic training. No one can have examined the muscles of the upper half of the body without being struck with the fact that nearly all of them diverge from the shoulder like a fan. Exercise of the muscles of the upper part of the back and chest is dependent upon the shoulder. It is the centre from which their motions are derived. As everyone not in full training has inflexibility of the parts about the shoulder-joint, this should be the first object of attack. These twistings are well calculated to effect the desired result. When practising them the position should be a good one—head, shoulders and hips drawn far back.

In our attempts to correct stooping shoulders, one good series of exercises is found in thrusting the dumb-bells directly upwards. While performing this the position should be varied.

MENTAL AND PHYSICAL BENEFITS OF GYMNASTICS.

Exercising tends to develop, in its greatest extent and perfection, the powers of the human frame, confers adroitness and activity and prepares us to encounter the greatest difficulties and dangers, besides imparting an agreeable air and easy manners, which never fail to prepossess strangers in our favour—which say nothing of the preference which the fairer part of creation uniformly gives to a fine manly appearance, and a con-

fidant and graceful address. By a hardy and vigorous education the body becomes accustomed to fatigue, while the different stratagems which are taught in gymnastics offer to the pupil a variety of means of self-preservation in the various hazards and dangers incidental to him in after life. But these are not the only advantages derived from the early practice of physical exercises; they give a tone and vigour to the mind not to be obtained by any other means; they induce a purity of thought—a resoluteness of purpose to act with promptitude and effect amid the greatest difficulties—and an elevation of soul which rises superior to the severer trials of life, and despises its petty troubles and anxieties. If, as some contend, that physical development to any extraordinary extent is generally made at the expense of mental, it is beyond contention that among men of thought it is the brain that stunts all the other organs.

The benefit of exercise to those whose occupation does not lead them to make any physical exertion cannot be too highly estimated. The body must undergo a certain amount of fatigue to preserve its natural strength, and maintain all the muscles and organs in proper vigour. This activity equalizes the circulation and distributes the blood more effectually through every part. Cold feet, or a chill anywhere, shows that the circulation is languid there. The muscles, during exercise, press on the veins and help forward the currents, by quickening every vessel into activity. The valves of the heart are in this way aided in the work of sending on this stream, and relieved of a certain amount of labour. When exercise is neglected the blood gathers too much about this central region, and the oppression about the heart, difficulty of breathing, lowness of spirits, anxiety and heaviness, numerous aches and stitches, are evidences of this stagnation. People are afraid to take exercise, because they fancy they want breath and feel weak, but the very effort would free the heart of this burden, by urging the blood forward to the extremities; it would ease their breathing by liberating the lungs from the same superabundance; it would make the frame feel active and light, as the effect of equalized circulation and free action.

#### PRACTICAL RESULT OF GYM- NASTICS.

There is no doubt but that, by constant exercise, the several muscles of the body may be very much strengthened, and im-

proved; and that, on the contrary, by disease, they become soft, flaccid, and weakened. The increase of strength, normally developed and exerted, is the increase of health. A regular exercise of the different muscles of the body, then, by which they are made to perform their various functions with firmness and precision, must be of the greatest consequence in contributing to the healthy and harmonious state of the system. This is particularly the case with the muscles of the chest, which perform so important a part in the functions of respiration; and it must be obvious that the more these muscles are strengthened and improved by judicious training from childhood upwards, the more likely it is that the chest will be strong and able to perform its important offices. But it is the same with almost every other part; the muscles of the arm swell out and become vigorous by regular use, and so likewise do those of the lower limbs. It may be remarked that, among some classes of the peasantry, who wear heavy shoes, with stout and unyielding soles, the back muscles of the leg, from want of use, are thin and flaccid; whereas, those of their arms and shoulders, being constantly exercised, are broad, square and fleshy.

#### ADVICE TO GYMNASTS.

Gymnasts should beware how they make a hobby of particular exercises, lest by so doing they produce misshapen development. A lack of symmetry, besides being unpleasant in appearance, invariably lessens the efficiency of the body at large, favours disease and shortens life. From symmetry results a balance of power, and the nearer we are to possessing it, the less we are liable to err in our conduct of life. There are probably few gymnasts, however, who do not approach symmetry rather than recede from it; and this will probably account for that improvement in character and disposition which gymnasts have been often said to exhibit.

With regard to accidents, these may generally be prevented by always faithfully examining an instrument before using it and shunning every exercise that is at all dangerous in itself; as, for instance, that of tossing and catching of cannon-balls, or the whirling about the head of clubs in the midst of a crowd, or high swinging with the unwise intention of touching the ceiling, when that ceiling may be perhaps 15 or 20 feet from the floor—or moving on ladders at such an elevation that a fall from them could only happen at the jeopardy of life

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 cautious gymnast to be severely injured,  
 and we think that in almost any gymnasium  
 the most cautious gymnast would be found  
 to be the strongest and most expert.

**DIFFERENT EXERCISES FOR YOUTH  
 AND AGE.**

There are certain kinds of exercises we  
 would not recommend to the aged; but  
 walking, rowing, horseback riding may be in-  
 dulgued in by people of all ages, male and  
 female. Boxing, fencing, wrestling, jump-  
 ing and running may be indulged in by the  
 young with safety, as also dancing, which is  
 a splendid form of exercise, when not sub-  
 ject to palpitation of the heart. Archery  
 and lawn-tennis have been added to our  
 other pastimes, so that where there may be  
 a slight falling off at times in one or the  
 other sport, new ones continually take their  
 place.

**CLASS OF MEN BEST ADAPTED FOR  
 ROWING.**

Rowing brings into play almost every  
 part of the body. At first sight it may ap-  
 pear that all below the waist is idle, but  
 this is by no means true, for the legs and  
 thighs take their full share in the muscular  
 exertion going on. Many mistakes have  
 been made in picking men from this error  
 in judgment; for it has been found, when  
 perhaps too late, that good knees and  
 thighs are required, as well as good arms  
 and shoulders. This is easily explained by  
 a reference to the work which is to be done,  
 and by examining the framework which has  
 to do it. It consists in pulling an oar or  
 scull through the water by the muscles of  
 the arms and back. But what enables the  
 power called into play by the arms and  
 back to act upon the boat? Why, the re-  
 sisting and pushing power of the legs and  
 thighs, without which the body would glide  
 off the thwart, and fall helplessly into the  
 boat. Hence it is manifest that just as  
 much as the arms generate the power by  
 pulling against the water, by so much  
 exactly will the legs convey that power to  
 the boat by pushing against the stretcher.

In selecting men for this beautiful and  
 healthful exercise, it should, therefore, be  
 borne in mind that the following points are

essential, though, of course, this, like all  
 similar rules admits of exceptions: First  
 and foremost, look to the moving powers—  
 the arms, shoulders and back. These should  
 be muscular, with good, bony wrists,  
 straight elbows, powerful and pliable  
 shoulders, and, above all, a good, strong,  
 muscular loin. Without this last point the  
 strength of arm is of no use; the body, in-  
 stead of drawing the oar to it by the muscle  
 of the arm, is itself drawn forward over the  
 oar, and the stroke is rendered ineffective.  
 Nothing is more difficult to foretell, by ex-  
 aminations, the exact degree of strength  
 which any individual form is capable of dis-  
 playing; but, with regard to the back and  
 loin, it is almost impossible to form any use-  
 ful opinion without actual trial; for so much  
 depends upon early habits of various kinds  
 that no conclusion from the formation can  
 possibly be arrived at. It is seldom that  
 any one can say, with anything like cer-  
 tainty, that a particular individual shall  
 make a good oar; but the contrary may  
 often be affirmed, and it may generally  
 be prognosticated that an awkward,  
 slow, and very high-shouldered man will  
 prove useless in a boat. Next to these points,  
 see that the legs and thighs (without  
 being too heavy) should be sufficiently well  
 developed to do their work. If too muscular  
 it is only so much extra weight to carry, and  
 they should be rather below than above the  
 proportionate size, as compared with the  
 arms. After the moving powers, it is need-  
 ful to consider the state of the lungs and  
 heart. The wind should be naturally good,  
 free from wheezing or cough; and the heart  
 should be healthy and free from palpitation  
 on excitement. This can only be ascertained  
 by a trial; and, indeed, that is the best mode  
 of arriving at an opinion on all the different  
 essentials for this, as well as all other bodily  
 exercises.

**DESCRIPTION OF THE MUSCULAR  
 SYSTEM.**

The muscles of the head and neck are the  
 occipito-frontalis, which lies immediately un-  
 der the hairy scalp, extending from the eye-  
 brows to the back of the head. Some per-  
 sons possess the power of moving this muscle  
 to a very considerable degree. Two muscles,  
 the temporal and masseter, arise from the  
 temporal fossa on the side of the skull, and  
 are inserted into the ascending portion of  
 the lower jaw, they give motion to the jaw  
 and are employed in the act of mastication.  
 The cheeks are formed of a muscle called  
 the buccinator. The muscle that forms the

NASTS.  
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 on ladders at  
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 ordy of life

lips is the orbicularis oris ; it is employed in the act of kissing, and consists of a number of circular bands that pass around the mouth. A similar circular muscle surrounds each of the eyes ; it is called the orbicularis palpebrae rum. The great muscle that forms the nap of the neck is the trapezius ; it throws the head back ; it is opposed by the sternocleidomastoid muscle, which bends the head forward on the chest. When both sets of muscles act together, the head is kept firmly fixed, as in carrying burdens. There are many other muscles in the head and neck, but these are the most prominent, and can be traced in the majority of paintings or pieces of sculpture.

The muscles of the upper extremities are the deltoid, triangular shaped, and covering the shoulder ; it raises the arm from the side of the body to a horizontal position. The trapezius aids in carrying it up to the vertical line. The biceps, or large muscles on the front of the arm, flexes the fore-arm on the arm, and makes the preparation for striking a blow. The triceps extends the fore-arm on the arm ; it is on the back of the humerus, and is used in delivering a blow. The muscles of the fore-arm are all small, and do not give any special marks or contours, except in persons in whom the muscular system is exceedingly well developed. The muscles of the trunk are the pectoralis major and minor. They form the breasts, and taking their origin from the sternum and inner edges of the upper ribs, are inserted into the humerus ; they are employed in folding the arms across the chest. Opposed in action to the pectoralis is the latissimus dorsi, which, arising from the lower two-thirds of the vertebral column, is inserted into the humerus, and throws the arms backward ; they are greatly developed by the exercise of rowing. The muscle which extends from the lower part of the sternum to the pelvis is called the rectus abdominalis. As is the case with nearly all the muscles of which we have treated, it is one of a pair ; with its fellow it forms the anterior wall of the abdomen ; it is divided transversely into three portions, the divisions being well marked only in very muscular individuals. The muscles which complete the walls of the abdominal cavity are the obliquus externus,

obliquus internus, and transversalis. The fibres of these muscles are arranged as their names indicate, so as to cross each other, and produce in their action an equable pressure on the organs contained in the abdominal cavity. In addition to these, there are a great number of small muscles in the back and between the ribs ; the latter are called intercostals ; they aid in carrying on respiration. The muscles of the lower extremities are : 1st. Those which form the buttocks ; they are called the glutei muscles. They are arranged in three layers, viz : external, middle and internal. Though these muscles exist in the lower animals, they are developed to a far greater extent in man, giving to him the power of retaining the erect position. Opposed to the glutei are the iliac and psoas muscles, which arise from the abdominal surface of the vertebral column, and, passing over the pubic bone, are inserted into the femur. The great muscles of the thigh are the rectus femoris, which passes from the iliac bone to the patella ; the vastus externus and vastus internus, which take their origin from the outer and inner surfaces of the femur, and are inserted into the patella ; they extend the leg on the thigh. The muscle which runs obliquely across the thigh, from the iliac bone to the inner edge of the tibia, is called the sartorius or tailors' muscle, since it is employed in bringing the lower extremities into the position assumed by persons of that trade while at their work. The muscles that are inserted into the patella, are in reality attached to the tibia, for a strong ligament, about two inches in length, passes from the lower edge of the patella, and is attached to a rough surface on the anterior edge of the tibia. The largest muscle on the back of the thigh is the biceps ; it flexes the leg on the thigh, and, since it takes its origin in part from the ischium, also aids in extending the thigh on the trunk. The muscles of the leg are the gastrocnemius, on the back of the leg, giving it its fullness ; it extends the foot on the leg, and raises the body in walking. The tibialis anticus, and other smaller muscles on the front of the leg, flex the foot on the leg and oppose the gastrocnemius.

THE END

