AN

INTRODUCTORY

LECTURE ON EDUCATION:

BEING

THE FIRST OF A SERIES

OF

PLAIN AND SIMPLE LECTURES

ON THE

EDUCATION OF MAN.

By THOMAS HOPLEY, F.S.S.

MEMBER OF THE EPIDEMIOLOGICAL SOCIETY, AND AUTHOR OF "A LECTURE ON RESPIRATION," &c.

(Written with a view to delivery in London.)

"Nothing is of more importance (if we would be happy) than to be careful lest we follow like sheep, who urge on not with a consideration of *where they ought to go*, but of *where others have gone*: nothing involves us in greater calamities than the fact that we live not according to *reason*, but according to *general example*. * * We might be restored to health if we would but cease to go with the crowd. * * Let us inquire, then, not what *others* do, but what is *best* to be done: not what is approved by the world, but *what will put us in possession of lasting happiness*."—SENECA, *De Vitâ Beatâ, cap. I, II.*

SECOND EDITION.

LONDON:

JOHN CHURCHILL, 11, NEW BURLINGTON STREET.

1856.

PRICE ONE SHILLING.

LONDON: PRINTED BY W. CLOWES AND SONS, STAMFORD STREET.

PREFATORY.

On putting forth this pamphlet, but few prefatory words are necessary.

Upwards of one hundred thousand human beings are annually perishing in England from preventable diseases.

In Scotland and Ireland the preventable mortality is comparatively even greater than in England.

Upwards of thirty per cent. of all the men, and upwards of forty-three per cent. of all the women, who marry in England, sign the marriage-register with a mark.

In Scotland and Ireland the people are not less ignorant than in England.

Throughout the length and breadth of the land, crime is increasing.

When a GRAND POPULAR OPINION is formed upon the solemnly-momentous questions of Health and Education, then, and not till then, will the

Country receive such legislative enactments as shall tend to diminish crime, root-out ignorance, and give long life to the people.

The work of which the first portion is now presented to the public, has been undertaken with an earnest hope that it may be permitted to prove instrumental in the formation of the required *opinion*.

The author writes for both sexes; and has aimed at treating his subject in language sufficiently plain and simple to be intelligible to every class of the community.

The Capital of the Empire has been fixed-on as the place where he trusts to make his personal appeal; but whatever of good doctrine the lectures may contain, concerns not London alone, nor simply the British Nation, but all humanity.

The Series will be delivered so soon as, with God's blessing on the effort, the proper time shall come.—(See *Advertisement*, p. v.)

Eastbourne, *July*, 1856.

(ADVERTISEMENT.)

PLAIN AND SIMPLE LECTURES

ON THE

EDUCATION OF MAN.

To be delivered, &c. . . . . London,
for the benefit of the Society for, &c.

"POPULAR OPINION IS THE RULER OF ENGLAND."—*Lord Palmerston.*

Anxious to help the formation of a "popular opinion" on the questions of Health and Education, Mr. Hopley proposes as follows:—*first*, To urge upon the serious consideration of such of the upper and middle classes of society as will favour him with a hearing, the fearful effects of certain errors existing in the systems under which their children are, for the most part, trained—errors requiring but determination among heads of families to be at once eradicated; and *secondly*, To show to all whom he may have the power to address, something of the physical and mental condition of the national poor, who can never be rescued from the sin and misery which are at present forced upon them, save by the energetic strivings of large bodies of men and women who will work, not for the sake of pay or human applause, but through love of God and their neighbour.

His lectures are arranged in two courses.

Summary of the First Course.

LECTURE I.—INTRODUCTORY.

Education the work of a whole life—Physically as well as mentally, "the child is the father of the man"—No sound theory of education unless based upon physiological principles

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* The cholera visitation of 1854 induced the publication of Lecture VI. out of its proper order.

their brains at the close of such entertainments—The young require more sleep than adults, the hard-working than the less laboriously employed—Another peep at our needle-women, and other female operatives—The labourer—Effects of want of sleep on his blood—Sanitary condition of the nation generally—All movements for the erection of baths and wash-houses, or model lodging-houses, or for the ventilation of mines, factories, &c., or for improving the dwellings of the poor, or for cleansing towns, or for a better water-supply, or for promoting temperance, or for reducing the hours of toil, or for cheapening any of the necessaries of life, are movements in the cause of education—"Strikes"—Duty of the poor—Of the rich—Of parents—Of educators—Of legislators.

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*In the SECOND COURSE OF LECTURES it is proposed to treat, at some considerable length, of moral and intellectual training as applicable to all classes of society—To consider to what extent moral training is neglected in the schools and colleges of the upper and middle classes—To consider the question of school-punishments, and of punishments generally—To show how the nation compels the poor to crime, and then punishes them for being criminal—To show the cost of crime, ignorance, and preventable disease, and the saving that would arise from training the people morally and intellectually, and from carrying out sanitary reforms throughout the nation—To show that the mortality which is enforced upon the poor, so far from keeping-down population, tends to augment, in the long run, the numbers of that very class which are a great enfeeblement as well as an immense expense to the country—To show that the best means of out-rooting poverty, and the best means of hindering dissensions from arising between employers and employed, and the best means of defence against foreign foes, and the best means of enabling ourselves to help the progress of oppressed peoples, in a word, the best means of advancing our own happiness, and that of the world at large, is to improve the entire nation by sound sanitary reforms, and by giving to all classes of society a greater intellectual and moral power.**

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* A further explanation of Mr. Hopley's views regarding the formation of the required POPULAR OPINION, is contained in "*Helps towards the Elevation of Society*," p. 2 (mentioned on the cover of the present pamphlet).

LECTURE I.

INTRODUCTORY.

"And think ye that it is an affair of but ordinary consequence concerning which you run a risk? Do not deceive yourselves. The matter in hand has reference to the most important of all your possessions. The happiness of families entirely depends on *the training of children*; and houses flourish or decay according as their children incline to good or evil."—Plato (*Laches*).

"But it is by no means enough to meet with right education *when young*, * * we want rules of conduct suitable to the *whole life*."—Aristotle (*Ethics*, x. 10).

I cannot but feel that the task which I have undertaken to perform is a difficult and a delicate one. We are gathered together to consider a matter upon which man's temporal and eternal happiness more closely depends than upon any other over which man has control—a matter, therefore, far too grand and sacred in character for me to venture to approach authoritatively: but so many earnest minds have of late years been occupied in searching-out the startling mysteries of man's being, and have by laborious investigations brought to light so many wonderful truths, all deeply affecting the cause now under consideration, that it has been thought that a simply-worded narrative of some few of the revelations of the world's philosophers, could not prove altogether uninteresting to a public audience, or be altogether devoid of public utility.

These lectures lay no claim, then, to originality. They aim at little beyond an application of well-established scientific facts to practical education.

But what do we mean by *education?* for the word is differently defined by different individuals.

To educate, using the phrase in its common acceptation, would appear to be, To teach the arts of reading, writing, and arithmetic, a little history and geography, some faint knowledge of religion, and perhaps a smattering of one or two foreign languages, to *children:* to educate, using the term in its noblest sense, is, To develop to the utmost capability of its powers the physical, intellectual, and moral nature of *man.* Thus in the eyes of many, education would seem to relate simply to the *young:* while to others, it shines forth as an object of the utmost importance to the *entire human race.* In its narrow signification, it may be said to terminate when the pupil ceases to be under the control of teachers; hence we hear of 'finishing tutors,' 'finishing governesses,' and 'finishing schools:' according to the more enlarged idea, *it never terminates but with the life of the human being.*

Education, then, as we regard the term, is THE SCIENCE OF MAKING MAN AS GREAT AS GOD WOULD HAVE HIM: and, as such, is of vital moment to us *all.*

We are all learners, though of different ages. We may be compared to ignorant travellers still journeying onward in search of the secrets of life. The only difference between old and young seems to be that while the young are being equipped for their pilgrimage and attended for some little distance on the road, their elders, having been already in a measure instructed concerning the ways of life, are supposed capable of pursuing the journey alone.

But though education is the work of a whole life, none can doubt that during early youth educational influences are most effective. Soft infancy is more susceptible of impressions than hardy manhood;

and it is but a continued series of impressions which form and mould man's character, and render him an agent either for good or evil. Just as the stone *will* roll, or the arrow *will* fly according to the primal impulse which directs the motion, so the thoughts and aims and energies of man will be directed in after-life according to the impulses given to the youthful mind. To the training of the youthful mind, then, attention must be more particularly directed; and to obtain a clear conception of the vast importance of this object, we need but recall to our recollection that he whom the universal voice of Christendom has styled *The wisest of mankind*, has affirmed that if a child be but trained in the right way, he will not depart from it in after life. It should be observed that the text—so often quoted, so rarely reflected-on—does not simply inform us, If a child be properly trained *most likely* he will prove a virtuous man—*in all probability* he will be wise and good. The words are clear and decided:—"Train-up a child in the way he should go, and when he is old, he *will not* depart from it."*

To disbelieve this text is to fancy one's self greater than Solomon:—believe it, and it is impossible to doubt that every crime committed in the world is owing, directly or indirectly, to evil training during childhood; that all who have the management of children from infancy upwards, are more or less answerable for their crimes in after life; and lastly, that if we can but discover the proper way of training-up a child, and possess the means of carrying the system extensively into practice, *education, with the blessing of Heaven, has the power of banishing crime and misery from the earth.* I do believe that it *has* this power; and looking upon it in this light, cannot but consider the cause of education as the most sacred cause that man can advocate: but I speak not of education as it

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* Proverbs xxii. 6.

is carried-on, or as it ever *has been* carried-on, but as it will in future times be carried-on by an enlightened posterity improving upon those plans which it is the duty—the *privilege* of the present generation to aid in maturing according to the best of their ability.

It is not, however, man's *mind* alone that depends upon his childhood's training; his health, likewise, and strength grow, as it were, out of the actions of his boyish days. In fact, the science of physiology has revealed that *physically* as well as mentally 'the child is the father of the man;' that long life and vigorous understanding spring alike from the nursery and the play-ground; that youth well spent is the parent of honoured age; yea, that sainted *Wisdom*—the beautiful IDEA who holds in her right-hand length of days and in her left-hand riches and honour, whose ways are ways of pleasantness, whose every path is peace*—is no other than the offspring of a little well-trained child.

The human mind has of late been much aroused to a sense of the importance of education. The public begin to feel their want and cry aloud to government for aid. This is a hopeful sign; a sure earnest of *advance*. Man has progressed enough to know that further progress is necessary. So much, however, remains to be done for this noblest of human causes, in comparison with what has up to this period been effected, that, obviously, before any educational system at all approaching to perfection can be largely realized in practice, a very lengthened period must elapse. Nay, when we consider how little the organic character of the human being is at present regarded by the people at large—how little the connexion between mind and body is understood even by those who have made the physiology of man their study, it is not too much to

* Proverbs iii. 16, 17.

affirm that education, as a system to be nurtured to maturity, is as yet—in the nineteenth century—only in its infancy. Before man can be developed to the fulness of his powers, his *nature* must be more carefully investigated, must be more fully understood by the *generality*; for how is it possible to form correct views concerning what is right as a scheme of education, all the while we are ignorant of the nature of the creature to be educated? Clearly it is *im*possible.*

Since, then, there can be no sound theory of education unless based upon physiological principles, it is purposed, by way of ground-work to our theme, to observe upon those natural laws which the Creator has ordained to govern the creature throughout the whole course of his earthly career—laws which influence alike the physical, intellectual, and moral character of man, and which, *being of God, work unceasingly and unerringly.* It is not, however, intended to enter deeply into physiology, but merely to bring forward in plain and popular language such simple physiological truths as may tend to place in a strong light the great call for an improvement in our modes of physical and mental training; as may tend to show the close connexion that exists between education and physiology; and show that the reason why so many educational systems do not bring about the desired result, is, *because they are not based upon physiological principles.*

In order to possess clear views of the science of

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* This was keenly felt by Pestalozzi:—"Only," says he, "by the accordance of the influences of education and training *with the eternal laws of human growth*, is man really educated and trained; by contradiction between the means of his education and training and those eternal laws, man is *mis-educated and mis-trained.*" Such were the sentiments uttered by the great-hearted man on his seventy-third birth-day, after upwards of half a century's earnest study of the question.—(*Life and System of Pestalozzi by Karl Von Raumer, translated from the German by J. Tilleard, p.* 62 *et seq.*)

education, it is absolutely requisite carefully to consider, *first*, the different organs that compose the human being, together with the laws which regulate the health of these organs; and *secondly*, the best mode of training the creature to act in accordance with these laws ordained by a benevolent Creator for the perfect development of man, as a combination of organs.

To treat these requisites with the fulness which their importance demands in one short course of lectures is evidently impossible; but it will be something gained for the human cause if such facts as may be brought forward should excite a desire to scrutinize them further, or should suggest to thoughtful minds other facts of equal moment and equally deserving serious consideration. The remainder of this lecture, therefore, will be chiefly devoted to *a reflection upon the divine laws which regulate the condition of man's organs.*

Man, then, as we all know, is purely an organized being, consisting of bones, cartilages, ligaments, muscles, nerves, blood-vessels, &c.; of organs of nutrition, absorption, circulation, respiration, secretion, excretion, motion, sensation, and thought. Every one of these performs its functional duties according to the unvarying laws of the great Creator; and not only is each particular organ governed by laws particularly applicable to that organ, but there is one general law which applies to every part of every organ throughout the system—*Every part of every organ continues or increases in vigour and efficacy by being duly exercised; but becomes enfeebled by being over-taxed, or by being permitted to remain too inactive:* in other words, *Due exercise of any organ continues or strengthens its functional powers and gives pleasure and health to the individual; while either the over-taxing an organ, or the not permitting it an opportunity of performing its proper offices in the human economy, renders it enervated and*

tends to the production of pain and the shortening of life. Philosophers have deeply studied the nature of man, and discovered, by the power of the intellect which God gave them, that such is THE CREATOR'S LAW, by which in his wisdom he sees fit to govern his creature. This law is without exception in its workings, and *cannot be broken with impunity.*

To elucidate this in a simple manner;—If *too much* food be received into the stomach, the digestive organs are over-taxed, and a general weakening of these organs is the consequence: if the stomach be furnished with *too little* food, the digestive organs are deprived of the opportunity of properly exercising their functions, and become enfeebled in consequence: * but if the stomach receive a regular supply of wholesome food, adequate to the requirements of the constitution, not only do the digestive organs healthfully perform their various offices, but continue in their strength, or even increase in functional energy, under the salutary influence of due activity. Again, If the eye be kept for a lengthened period in gloom or utter darkness, shut out from the opportunity of exerting its powers, these powers become enfeebled: and if it be day after day employed in continuous scrutiny of very minute objects, or be unduly exposed to glaring lights, it suffers from the too severe ordeal:† but by being *duly exercised* without being over-taxed, it attains a perfection of vision far beyond the experience of the generality. The sailor, who from a boy has been in the habit of scanning the vast expanse of ocean, or the man who has for years been actively employed at one or other of the preventive-stations on our coasts, easily distinguishes the distant sail when altogether undiscernible by the less

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* Thus to famine-stricken patients, whose digestive organs are enfeebled through want of exercise, the physician at first prescribes but a *scanty* diet.

† Hard-wrought needle-women are generally close-sighted, and inflammation of the eyes prevails to a very great extent among glass-blowers.

practised eye. These are simple instances of the fact that *Either inactivity of organs, or the over-working of organs, enfeebles their functions: while their vigour is retained, or even improved, by due exercise.*

It were too long a process to exemplify the influence of this law among all the organs just now enumerated. Suffice it that what is evident concerning the stomach and the eye, physiology proves to be equally true concerning every structural substance of the system—the bones, the lungs, the liver, the skin; the vast number of muscles; the countless nerves and blood-vessels; the instruments of smell, of taste, of touch, of hearing; and the brain throughout its functions.

In no part of the structure, however, is the effect of the law of exercise so easily noticeable as in the muscles. There are few persons but must have observed the unusual development of the arm of the blacksmith, who is occupied during a considerable portion of almost every day in wielding the heavy forging-hammer; and any one whose attention has been drawn to such of the Thames boat-men as have for years passed much of their time in plying the oar upon the water, must have been struck with their breadth of chest and brawny arms, while the loins and lower limbs, owing to a routine of comparative inactivity, are so impoverished as in some instances scarcely to appear belonging to the same individual. If the chief exercise taken by these men had been of a kind similar to that of the culprit at the tread-mill, where the lower extremities are principally called into active exertion, doubtless a somewhat contrary development would have been the result:—but every one who sees that his right arm is larger than his left, understands that had he been in the habit of exercising from early childhood both arms equally, they would have been equally muscular. Such, then, is the law of organic exercise, ever powerful throughout man's system, which is one beautifully-arranged combination of organs, each dependent, more or less, upon

the health and activity of all the rest, yet each continually becoming more invigorated or more enfeebled according to the amount of work performed. Permit me to repeat that this law, which is evident in its action upon the stomach, the eye, and the various muscles of our wonderfully-constructed frames, rules in our bones, nerves, blood-vessels; in the liver, the lungs, the skin; in the beating heart; in the thinking brain; in short, at every point of the human body:—*Every vital organ—every power, or function, retains or improves its vigour by proper exercise, but becomes enfeebled by being over-taxed, or by too great inactivity.*

The vast educational importance of this law will be more fully appreciated when we have reflected upon certain physical phenomena constantly going on within the system.

Physiology boldly announces it to be a clearly-ascertained fact that not the slightest movement of the body can be effected, not the faintest idea can emanate from the mind, without a *disorganization of particles* taking-place. Each organ called into action has undergone a positive change. Certain atoms of life are transformed—displaced—altogether *separated and lost* from the excited structure. "Physiology," says Professor Liebig, "has sufficiently decisive grounds for the opinion that every motion, every manifestation of force, is the result of a *transformation of the structure or of its substance*; that every conception, every mental affection, is followed by *changes in the chemical nature of the secreted fluids*; that every thought, every sensation, is accompanied by a *change in the composition of the substance of the brain.*"* Thus, every movement of the body, and every emotion of the mind, is accompanied by a positive loss or change of particles in the organs excited to activity.†

* Liebig's Animal Chemistry, p. 9.

† "It may be stated as a general proposition that *a change in chemical*

Now, it is very clear that as these organic changes —these chemical dissolutions—are continually going on, and at a very rapid rate, if there were no counteracting, no re-productive principle actively at work within the system, since every *thought* and *act* preys, as it were, upon some organized substance, there could be no such thing as *growth* or *increase*, so far as the human being is concerned: nay, even if it were possible for man to find himself existing at all under such an arrangement of nature, he would be existing in a state of atrophy—would be daily and hourly becoming more and more attenuated—and speedy extinction would be the inevitable consequence. This is hindered by the vital action of the *blood*, which, during our entire lives, is constantly engaged in visiting every the most minute part of our wonderful frames —even the very interstices, the very marrows of our bones; and is constantly carrying with it all the elements of nutrition and re-production—is constantly employed in supplying, or endeavouring to supply, materials to compensate for the waste which is *as* constantly going on in our various organs.

Not having proposed to touch upon physiology further than is necessary for the elucidation of our subject, it would be out of place here to treat at any great length concerning the circulation of the blood. Suffice it that a man of ordinary bulk and stature is supposed to have between twenty and thirty pounds, or nearly three gallons, of blood flowing through his system; that no more than 2½ minutes are necessary for a round of circulation to be performed—in other words, that the mass of the blood contained in the body issues from the heart, performs its circuits of duty,

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composition is an essential condition of every vital phenomenon."—*Carpenter's Human Physiology*, § 254. "The exercise of the animal functions is essentially *destructive of their instruments*."—*Ibid.* § 263. "In whatever act we may be engaged, even in the very act of breathing, organic *change* and organic *waste* are invariable concomitants."—*Combe's Physiology of Digestion*, 7*th ed.*, *p.* 1.

and returns to the spot whence it set-forth, once in about 2½ minutes,* or about twenty-four times in the space of an hour; that all the muscular or fleshy portions of the body, with the hair, the nails, the bones, the enamel of the teeth, the nervous cords, the *brain* —that marvellous creation through which DEITY permits mind to act,—in short, every point of the human fabric, is nourished, re-produced, and invigorated by the particles supplied through this wonderful fluid, which, while performing a healthful circulation, not only *mends* or *re-builds* (as was said) the different organs of the system, but (as was instanced in the educated arm of the blacksmith, and in the educated eye of the preventive-man) makes every organ, disorganized by act, thought, or sensation, *more capable of act, thought, or sensation, than it was before*: thus, we cannot stir, we cannot feel, we cannot perceive or think, without the chemical transformation of some muscular, nervous, cerebral, or other structural substance; which structural substance is subsequently mended—nay, *increased* in power, by a healthy circulation: and thus man is continually changing—continually becoming *dis*organized and *re*organized; and the nature of his disorganization and subsequent reorganization depends—not taking into consideration what the world terms 'accidents'—entirely upon his own thoughts, words, and actions, and the thoughts, words, and actions of his fellow-creatures. Perhaps among all the millions of humanity—among all the living millions this vast globe contains—there is not one vital particle—not even a particle of hard tooth

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* 2½ minutes or *less*. Different portions of the blood complete their circuits at very different periods, the length of the periods depending mainly on the length of the circuits. A portion of the vital stream leaves the interior of the heart simply to permeate the substance of the heart itself; another portion makes a circuit through the chest; another through the head; another through the extremities of the fingers. The *longest* circuit is supposed to be performed (when the pulse is beating tranquilly) once in about 2½ minutes. See Note †, p. 20 of the author's Lecture on Respiration (shilling edition).

or bone—the same as it existed six or eight years ago; and probably six or eight years hence the systems of those who may be destined still to survive on earth, will not contain one particle which they contain at present. Change we must unceasingly; but whether we change for the better or for the worse—for a more happy or a more miserable condition of vitality—will entirely depend upon how far we obey or disobey the perfect laws which an all-perfect God has ordained to regulate man's being. These, remember, are not opinions to be combated—not mere *ideas*, to be accepted or rejected at pleasure; but these are *facts*—facts drawn from out the golden mine of deep research by the greatest physiologists and experimental philosophers, of the world.*

When we reflect on this—When we reflect on these mysterious mutations continually going on within ourselves—mutations over which we, as free agents, have such vast control, what an important aspect does education at once assume! If any human being—*any human being who has not yet reached his prime*—pay but the due attention to diet, exercise, and other well-known requisites for bodily health, his physical character is day by day improving under the influence of *physical* education: if he be constantly making due use of his reasoning powers, and his powers of observation, perception, and memory, his brain is increasing in volume and vigour in the regions of *intellect*;—he will day by day be more *capable* of observing, perceiving, remembering, and reasoning, as his intellectual powers improve under the influence of *intellectual* education: and if he be day by day endeavouring to live as becomes a Christian,—if he manifest a veneration for the Deity and the works of the Deity,—if he practise

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* The earlier physiologists argue that the body is entirely renewed in six or eight years; but later investigators consider that renewal takes place far more rapidly. In early youth this is undoubtedly the case; and with many portions of the system throughout life. See Lardner's Museum of Science and Art, vol. viii. p. 90 *et seq.*

integrity, have a feeling for the poor, cultivate the social virtues,—in a word, if he endeavour to act towards his neighbour, who is his brother in the world, as he would have his brother neighbour act towards him, those portions of the brain from which emanate all these actions and sentiments are daily becoming strengthened, and increased in volume, under the influence of *moral* education. Surely the expression was not too strong when I spake of the cause of physical, intellectual, and moral education as the most sacred cause that man can advocate. And happily for the world it is a cause that *must* advance in spite of every one who would chain the wheels of progress. It is a cause that *is* advancing daily more rapidly than people are aware; for in our own country alone thousands and tens of thousands who bear not the name of educators, are unprofessingly working in the cause of education. All the sincere among the medical faculty, all who relieve the wants and ailments of the body, all the promoters of sanitary measures, are *physical educators*, who, while strengthening and improving the physical man, render the moral and intellectual man more capable of improvement: every one who would advance literature and the arts, or any of the liberal sciences, whether practically, orally, or by his pen, is an educator of the human *intellect:* but beyond all, the ministers of Christ's religion—not they who merely profess themselves as such—not they who, quibbling over words, forget the spirit of the Gospel, who make contention while preaching peace, —but all who by precept and example exert a happy influence upon the minds of those around them, are *moral* educators of the very highest order: nay, any one actively, usefully, and honestly employed in any business, profession, or calling whatever, is unprofessingly *an educator*, who by his example is teaching how such business, profession, or calling should be carried-on. Thus are all the good engaged in education; while every evil-doer is a chainer of the wheel, a re-

tarder of man's happiness. Solemn indeed are man's responsibilities who cannot stir, feel, perceive, or think, without a direct influence upon his own nature, without an indirect influence on human nature generally. Whatever is done in the sight of a fellow-creature, whatever is done in the hearing of a fellow-creature, whatever is done that shall reach the thoughts and understandings of our fellow-men, cannot possibly be without an *effect*—an effect either for good or evil—a positive effect upon the organization and character of every one who sees, who hears, who thinks-upon, the act in question. Thus we see how dependent we are upon each other's conduct, and how essential to human happiness it is that *Man should be the friend of man.* Thus, too, we see how education is going on day by day, hour by hour, is the work of a whole life, and of the utmost importance to every member of the human family.*

To continue our reflections upon Nature's laws.

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* The disorganizing and reorganizing effect of act, thought, and sensation, and its deep importance in an educational point of view, were not lost sight of by ancient philosophers. The laws laid down by Aristotle for the consummation of happiness or "the perfect good," which he defines as "an energizing of the soul according to virtue," would seem to be based upon such physiological knowledge (*see Ethics, passim*). Plato makes Cebes remind Socrates "that each soul, if it live many years, wears out many bodies;" and again, "that the body wastes while the man is still alive, and the soul is constantly creating anew those parts of the structure which have been consumed" (*Phœdo*). Many of the sentiments uttered by Socrates in reply are exceedingly beautiful, and bear upon our subject;—"If," says he, "the soul is immortal, there is need of education, not only with an eye to the time which we term *this life*, but with an eye to *all eternity*. * * * Were death the dissolution of the whole man, it would be an undoubted advantage to the wicked to be rid after death at once of their bodies, their souls, and their vices: but in as much as the soul is immortal, it can have no refuge from woes, no salvation, save by becoming as good and wise as possible; for the soul carries nothing along with it but its good or bad qualities, its virtues or vices,[1] which are the cause of its future happiness or future misery."

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[1] More literally, *carries nothing along with it,* πλὴν τῆς παιδείας τε καὶ τροφῆς, *except instruction and training;*—that is to say, *except whatever good or bad qualities it may have acquired, during its sojourn on earth,* THROUGH INSTRUCTION AND TRAINING.

Physiology proves plainly what I have been able to explain but briefly, that *Every vital organ*—whether it be bone, or muscle, or nerve, or brain, or blood-vessel, or any other of the organs that combine to form the system—that *Every vital organ, every power, or function, continues or increases in vigour and efficacy by proper exercise, but becomes enfeebled by being over-taxed, or by too great inactivity.* That such law exists and is constantly at work within us, has, it is hoped, been rendered fully manifest. We have noticed its effects upon the educated arm of the blacksmith and the educated eye of the preventive-man, and by comparing the brawny chest of the water-man with the impoverished condition of his lower limbs. But it would be well to imprint on our minds *the unerring and exceptionless character of this law.*

It has been shown that not the slightest excitement of any organ can take-place without a positive loss or change of its vital particles. Clearly, then, the more any organ is used, the greater will be the loss or change of particles in that organ, and the greater the necessity for a supply of the re-creating blood which we have seen is, while healthfully circulating, ever engaged in strengthening disorganized structures. Now, the re-creating powers of the blood are not inexhaustible, but, like the other essentials in the system, require regularly and constantly renewing; if, therefore, any organ is more than duly used—that is to say, is disorganized beyond the reorganizing capabilities of the blood—such organ must of necessity remain impoverished for a period; the duration of which period will mainly depend upon the health of the blood, and the extent to which the over-taxed organ has been disorganized: thus we see how utterly impossible it is but that organic structure *must* become enfeebled by being over-exercised. Again, it is a known principle in physiology that while any organ remains inactive, the life-giving blood flows inactively through that organ; for it is action that excites in an

organ an increased flow of blood, which fluid is as requisite for carrying-on functions as for repairing the system; an organ, then, by remaining inactive, deprives itself of its due share of blood, and consequently of its due share of nourishment: and thus we see how utterly impossible it is but that organic structure *must* become enfeebled by too great inactivity. Nature, who does nothing in vain, refuses to strengthen for use what we refuse to use: if we neglect to employ our organs, she neglects to fit them for employment.

And here it becomes evident that man was not placed on earth to be an idler; for his health and happiness depend upon the proper exercise of his body and his mind: *no idler under any circumstances can be healthy or happy.* Nor has man been created to be a drudge—a slave; for *there can be no over-taxing of any organ whatever without an infringement of a law of* God. But more than this—and I beg of you to mark the great though simple conclusion to which we are brought by the foregoing arguments;—It is evident that if we believe in the certainty of the results which have been shown to follow from due activity of organs,—if, that is, we believe in the perfect working of the divine law upon which it has been shown that organic health depends,—and how can we do otherwise, believing, as we do, in God's perfection?—since, then, we *must* believe in the perfect working of this law, it follows as an indubitable fact, that every one born with a sound structural formation—if not visited by what the world calls 'accidents'—has only to exercise properly every organ throughout his system—neither over-taxing any, nor refusing any its due share of duty—to enjoy, throughout life, sound mental and bodily health, with consequent happiness and length of days; and when we call to mind that among those who pay the due attention to the laws of health a child born with imperfect structural formation is comparatively-speaking a rarity, and that whenever such an unhappy event transpires, it transpires from causes

avoidable by mankind,*—when we call to mind these undoubted facts, are we not driven directly to the conclusion that if the world were not wrapped in such sinful ignorance—such sinful, apathetic ignorance of the laws ordained by God to make his creatures happy,—man might, under these loving laws, and aided by no new miracle from heaven, so root out trouble from the Earth as to render it almost a Paradise again. Health, intellect, and morality might more and more abound, sickness and mental weakness become rarer and still more rare, as the laws of being became better known, and better and still better practised.

But perhaps some among you who have been accustomed to think of our planet as of a spot in space where true happiness has not been destined to dwell, may feel inclined to ask, Can this be possible? Can it be possible that in this world, so full of pain and trouble, so full of misery, disease, and death—can it be possible that even here on earth there exists a way for man to escape almost all sicknesses and almost all sorrows? To these I would reply that such is the growing opinion among Christian philosophers—such is the firm faith among some of the wisest and greatest of mankind. And why should we be sceptical on the matter? Is not God perfect love? How, then, can we doubt but that perfect love exists in all His laws? Is not God perfect wisdom? How, then, is it possible for Him to have formed laws for man's happiness which it is impossible for man to obey? Is not God in all things perfect? How, then, is it possible but that perfect obedience to His laws *must* bring about perfection?† Yes, we *must* believe—we dare not doubt, that the great human family may be happy here on earth. God dispenses naught but blessings: 'tis *man* that makes Earth's misery. To show this

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* These important truths are dwelt upon at some length in a subsequent lecture.

† "All things are double one against another, and HE hath made nothing imperfect."—*Eccles.* xlii. 24.

man the error of his ways—to lessen misery and in time, may-be, eradicate—is, under God, the office of *education*, whose sacred privilege it is to train mankind to a knowledge and observance of the laws ordained for human happiness. IGNORANCE *is destroying the people;* but education, by the blessing of Heaven, shall regenerate the world. What feelings swell the breast at the contemplation of such a scheme! How full of hope is such a creed—hope for every one who sorrows for the miseries of man—hope for the whole world, to whom the all-benevolent, universal God has thus given the unerring means of working-out its own salvation!*

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* "Ignorance does not simply deprive us of advantages; it leads us to work-out our own misery. It is not merely a *vacuum* void of knowledge, but a PLENUM of positive errors, continually productive of unhappiness."—*Samuel Bailey's Discourses, &c., p.* 121.

"Society groans under the load of suffering inflicted by causes susceptible of removal, but left in operation *in consequence of the prevailing ignorance of our own structure*, and of the relations of the different parts of the system to each other and to external objects." * * * "It cannot be too deeply impressed upon the public mind that disease and pain are *aberrations from the normal condition of the universe.* Their prevalence to such an extent as mankind at present endure, forms *no necessary part of the plan of creation*, but is the result of the neglect of certain laws, which, when observed, maintain the organism in health and strength."—*Physiology applied to Health and Education, by Andrew Combe, M.D. &c.,* 14*th ed., pp.* 2 *and* 23.

"It must now be considered an established truth in science, that the health, the well-being, and the duration of the life of man, are intimately connected with the observance of the natural laws of the universe in which he dwells. The acknowledgment of this fact is not, however, sufficient to ensure obedience to those laws. *Men must be taught individually and collectively to obey them;* each man for himself; every family, in order to ensure its possession of that immunity from disease *which the Great Creator obviously intended his creatures to possess.*"—*Appendix* (A) *to the Report of the General Board of Health on the Epidemic Cholera of* 1848 *and* 1849, *by Dr. Sutherland, p.* 3.

"Our remedy against disease and debility is to be found in *knowledge.* Once let the mass of the people be instructed in their own frames; let them understand clearly that disease is not accident, but has fixed causes, many of which they can avert, and a great amount of suffering, want, and consequent intellectual depression, will be removed."—*Channing's Works, vol.* v. *p.* 215.

"The general thing here insisted on is, not that we see a great deal of misery in the world, but *a great deal which men bring upon themselves by their own behaviour*, and which they might have foreseen and

Let us reflect further upon Nature's laws. It is very evident that the two antagonistic laws which have been shown to be constantly at work within us (the law of *dis*organization and the law of *re*organization) vary in their agencies at different seasons of our lives. The stature of the human being continues to increase until he has reached the term of about one-and-twenty years, when he is said in common language to have 'done growing.' But though this is the case so far as height is concerned, there is manifested, for a long subsequent period, a gradual improvement in the strength and substance of the osseous fabric, in muscular development, in breadth of chest, in the powers of the brain—in short, throughout the system. The man of thirty or five-and-thirty years, is, for the most part, of more athletic form and of greater intellect than the man of one-and-twenty. Afterwards follows an indefinite interval called 'middle age;' during which the different organs do not materially *in*crease or *de*crease, either in size or in functional activity. Then comes the gradual decline—the slow wasting-away of vigour—the fading of nervous energy—until exhausted Nature can work her miracle of life no longer. Clearly, then, in early youth the creative agency greatly predominates over expenditure of structure—gradually diminishes in efficacy as man's development advances—at about the age of five-and-thirty becomes, as it were, on a *par* with the disorganizing agency—and so continues for an indefinite season. At length the disorganizing agency begins

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avoided."—*Butler's Analogy of Natural and Revealed Religion* (*People's Edition*), *p.* 15.

"My people are destroyed for lack of *knowledge*."—*Hos.* iv. 6.

"Get wisdom, get understanding: forget it not; neither decline from the words of my mouth.

"Wisdom is the principal thing; therefore get wisdom: and with all thy getting get understanding.

"Hear, O my son, and receive my sayings; *and the years of thy life shall be many.*

"*Take fast hold of* INSTRUCTION; let her not go: keep her; *for she is thy* LIFE."—*Proverbs* iv. 5, 7, 10, 13.

to predominate over the creative agency; when a gradual enfeebling of organs ensues, until Nature gives way in her weakest point, and man, as an earthly being, exists no more.

Let it be noted, then, that after the age of about five-and-thirty, no material improvement in man's organs is to be expected. He is then in his *prime*—moulded to that prime, whatever it may be, by the *thoughts, words, and actions of his past life* disorganizing and reorganizing those germs of endowment with which his gracious Creator blessed him as his birth-gift. Five or six times while advancing to that period has the whole organized man been *used-up*, and *re-built:* and at every re-building has proved stronger or weaker, better or worse, more happy or more miserable than before, according as the laws of the Creator have been obeyed, or broken. Of course it is not meant that the character of man cannot alter in after years. If he have not attended to the laws of life, and still continue disregardful of those laws, his body will become more infirm; his mind more feeble or depraved. If he make use of his intellect for the acquirement of knowledge, his knowledge and experience may teach him (supposing they have not previously done so) that to be really happy, man must strive to *be* good and to *do* good in the world; thus, he may practise a sounder morality, reap a greater amount of enjoyment, and become a more useful member of society. But after the age of five-and-thirty his organization, taken as a whole, cannot be expected to grow more vigorous. He will not be more *capable* of act or thought. He has his *full powers;* is, in fact, in his *prime.* The creative agency after that period will be but on a *par* with the waste of structure. There will be *no more development*—no more development of muscle, or nerve, or brain, or any organ whatever, save by robbing other organs of their due share of the elements of nutrition.

How clearly does this point out the vast importance of an early study of the laws of life; and how clearly

does it demonstrate the truth of the proverb that 'the child is the father of the man'? It is during youth, but more especially during *childhood*, that the building energies of the blood are so active for good: it is during *childhood* that the muscles, by being duly exercised, become more healthfully developed—that the lungs, by being fairly used, are well enlarged—that the digestive functions may be strengthened—that all the senses may advance in excellence: it is the eye and the ear of the *child* which may be trained in such a way that in after life the eye shall not grow dim, nor the ear refuse its hearing: it is the *child's* soft, gentle, pliant brain, which, by being properly cultivated, improves in thought, in sentiment, in memory, in power, in a knowledge of the right way—the way to wisdom, to virtue, to happiness—from which he never *will* depart in after life. This being so clear,—It being so very evident that the season of youthful training is the most important of human existence, with reference both to mind and to body, it requires no apology, if, during the remainder of this course of lectures, while considering *man's* education, I should be found dwelling more particularly on the training of the *child*.

The first twenty years of man's life form an all-essential period in his development; but the earlier half of this period is far more valuable than the latter. It comes not within the compass of the present occasion to treat of the management of infancy; I cannot, however, forego the opportunity of remarking that any one who shall carefully study the physical laws which govern the growth of organs, will feel convinced that the first *five years* of the human being's existence are of such vast moment, that his mental and bodily health in after life must, in a very great measure, depend upon the treatment received during that early season:* and yet, perhaps, there is no part of educa-

* The facts which physiology would here demonstrate by *argument*, earnest educationists have proved by *experiment*. Mr. Stow, after five-and-thirty years of practical experience, says, "You increase geometri-

tion so terribly neglected—so fearfully misunderstood—as the mental and bodily training of infancy.

The mental training of a speechless babe may seem a paradox; but it ceases to appear so when we consider that ideas enter the mind through the ear, and through the eye, and through other organs of the senses; and that every idea has its particular effect upon the tender, growing brain. "Infancy," says the learned Bichat, "is the age of sensation: as every thing is new to the infant, every thing attracts its eyes, ears, nostrils, &c.: that which to *us* is an object of indifference, is to *it* a source of pleasure" * or the contrary. "During childhood," as Dr. Brigham observes, "the brain is 'very soft,' and *it is supplied with more blood in proportion to its size than at any subsequent period:* it then grows most rapidly, and more rapidly than any other organ: *its weight is nearly doubled at the end of the first six months.*" † Now, how is it, let us ask, that the weight of the brain "*is nearly doubled at the end of the first six months?*" and why is the brain during infancy "*supplied with more blood in proportion to its size than at any subsequent period?*" We learn from physiology that "new matter is not deposited before the removal of the old"—that *no growth whatever* can take-place in the animal economy without previous disorganization.‡ This rapid increase, then, is occasioned by sensations, either pleasurable or the contrary, acting upon the brain through the medium of the eyes, ears, nostrils, skin, palate, stomach, &c.; and the extra supply of blood is

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cally in power as you descend in age; for if *training* at twelve years of age be calculated as *one*—at nine it is as *two*—at seven as *four*—at five as *eight*—and at three years of age as *sixteen*. Thus children at three years of age are sixteen times more easily, and therefore more efficiently, trained than at twelve years of age" (*Stow's Training System and Normal Seminary, 8th ed., p.* 128). Undoubtedly this "important practical principle" applies with *still increasing force* to children of two years old, one year old, or younger.

* Bichat's General Anatomy, vol. i.

† Influence of Mental Cultivation and Mental Excitement upon Health, by Amariah Brigham, M.D., p. 40.

‡ Smith's Philosophy of Health, vol. ii. §§ 843 and 987.

in order to re-create in greater volume than before whatever cerebral substance has, in accordance with the laws of exercise, been transformed during congenial or uncongenial sensations. Clearly, therefore, while the budding brain is being so rapidly developed, great pains ought to be taken that it should be only affected *agreeably*, and never very powerfully affected, at that tender period. With every infantine emotion—whether of joy or sorrow—seeds are being sown in the young mind to bring-forth good or evil fruits at an after season.*

And then with respect to the infant's *bodily* training. It may be seen from a study of the Registrar General's Reports that not far short of *one-third* of all the deaths registered in England are of infants who have not completed their second year; while for every year concerning which we have any adequate registration account, between *one-third and one-half* of all the occurring deaths are specified as of *children under five years old.* Mark well the startling declaration—BETWEEN ONE-THIRD AND ONE-HALF of all the occurring deaths are of CHILDREN UNDER FIVE YEARS OLD! † This awful destruction of infant life is always

* Waste and renewal take-place more rapidly in the youth than in the man of mature age; in the child than in the youth; in the infant than in the child; and in the new-born babe than in the babe of a few months old: and it may be stated as a general truth that the more rapidly waste and renewal take-place in the system, the more effective for good or evil will be good or evil influences.

† *Table of Child Mortality in England.*[1]

A.D.	Total Number of Deaths.	Under 1 Year.	Under 2 Years.	Under 5 Years.
1846	390315	93644	127927	160620
1847	419666	88508	121132	158371
1848	398531	86407	116980	156505
1849	440839	92171	123048	161100
1850	368995	86302	114360	144661
1851	395396	94753	126746	159945
1852	407135	98660	131776	166114
1853	421097	97931	130858	165078
	3,241,974	738,376	992,827	1,272,394

From these statistics it is seen that of 3,241,974 human beings who

[1] Calculated from the Registrar-General's Ninth Annual Report, p. 119; Tenth Annual Report, pp. 248, 249; Eleventh Annual Report, pp. 248, 249; Twelfth Annual Report, pp. 212, 213; Thirteenth Annual Report, pp. 110, 111; Fourteenth Annual Report, pp. 98, 99; Fifteenth Annual Report, pp. 100, 101; and Sixteenth Annual Report, pp. 98, 99.

at work with greater power in crowded towns. Thus, in this Metropolis, during the comparatively short space of seven years, the enormous aggregate of 139,612 children have perished before entering their sixth year!—no less than 58,980 over and above the calculated average for districts in the immediate neighbourhood where the laws of health are more fully observed! In other words, in the short space of seven years there have perished here in London, at the very lowest estimate, 58,980 children, every one of whom there is the strongest reason to believe might have been reared to health and happiness, *all having perished from causes proved to be preventable!* *

These few remarks may tend to show that education, mental and bodily, commences *with the very dawn of life.* If they should occasion only one parent-hearer, one friend of the young, to consider the laws which govern the infant's growing mind, or inquire out the causes of this startling mortality, they will by no means have failed in point of utility. It cannot

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died in England during the years 1846-53, *more than seven hundred and thirty-eight thousands* had not completed their first year; nearly *one million* had not completed their second year; and UPWARDS OF ONE MILLION, TWO HUNDRED AND SEVENTY-TWO THOUSANDS, were *children under five years old!*

* "The deaths registered in London (1838-44) under 5 years of age, were - - - - 139,612
The deaths, if the mortality had not been higher than in Lewisham, would have been - - 80,632

Excess of deaths in London among children under 5 years of age - - - - - 58,980 in seven years."—*Registrar-General's Tenth Annual Report, p.* x.

If we look to more recent statistics, we find that the rate of infant mortality in towns is *on the increase.* Thus, in 1852 the number of children under five years old who perished in London, was 22,507 (*Fifteenth Annual Report, pp.* 100, 101), which multiplied by 7 is 157,549: in 1853, the last year for which the returns have been published, the number was 24,713 (*Sixteenth Annual Report, pp.* 98, 99), which multiplied by 7 is 172,991: allowing for growth of population, this death-rate is still considerably above the average of 1838-44. In the large towns of Lancashire "the mortality of children under five years of age is *twice as high* as it is in the healthiest counties, and much higher than in London" (*Fifteenth Annual Report, p.* 21).

be too strongly urged upon public consideration that by a careful study of laws *ordained by* GOD, we arrive at the inevitable conclusion that under a practicable obedience to these laws every one born with a sound structural formation might pass through infancy, youth, and manhood, in the constant enjoyment of health, both of mind and body: and if we believe the scriptural text informing us that a well-trained child *will not* in after life depart from the right way, we *must* believe that *Every crime committed in the world is owing to evil training during childhood.* How solemn, then, is the trust reposed in all who have the management of children! how sacred the duty enjoined upon every mother among mankind! *

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* Perhaps a more valuable educational work never issued from the press than Dr. Andrew Combe's *Practical Exposition of the Principles of Infant Training*, FOR THE USE OF PARENTS.[1] It were well if every mother of little children, and, more especially, *all who are likely to become mothers*, could, with an earnest desire to know a mother's duties and responsibilities, give it a most attentive perusal. Not only would their eyes be thus opened to very many preventable causes of child disease and child mortality, but they would be led to perceive (a matter how little thought of by the generality!) that education—physical, intellectual, and moral—is at work, not simply from man's earliest breath, but *literally* from "the very dawn of life"—that is to say, for *months before the period of birth*, at a season when every act, every word, every thought, every struggling after right or yielding to wrong on the part of the mother, has an effect upon the structural formation and on the future tendencies of the growing babe;—at a season when the mother's "*habitual state* of mind and body, whether it be that of excitement or inactivity, of good or bad temper, of sound or broken health, exerts a positive and *constant* influence on the offspring" (chap. IV). What suffering during childhood, what sorrow at all ages might be avoided, were females to learn these truths in time! No nobler mission can possibly fall to the lot of woman than that which she imposes on herself when, so soon as she is aware of the probability of her entering upon the marriage state, she *determines* to leave no stone unturned towards striving to become, in the fullest sense of the phrase, A GOOD MOTHER;—when she determines—with an earnest confidence in the perfection of God's laws, and possessed of His blessing on her efforts—not only that the development of her unborn offspring shall proceed

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[1] Maclachlan and Stewart, Edinburgh. Simpkin, Marshall, & Co., London. Price, half-a-crown.

A few further remarks upon the blood will serve to bring this introductory lecture to a close.

Since it is the office of the blood to build-up the system, it is evident that this fluid, to perform the office properly, should in its composition contain the elements of all the substances which compose the human being. Such, therefore, is the case. The constituent elements of the hair, of the nails, of the enamel of the teeth, of the bones, of the muscular or fleshy portions of the body, of the veins, arteries, capillaries, heart, nerves, brain—in short, of every structural substance in man's system, are discoverable by analysis in healthy blood: and in order that all man's organs—mental and bodily—should be properly invigorated, it is absolutely necessary that his blood, from which these organs are constructed and through which their functions are performed, should be of a healthy character.* To bear this carefully in mind is of

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under the influence of the highest possible state of physical, intellectual, and moral health of which her nature is susceptible, but that, Heaven still helping her, she will so train the children committed to her care that in after life they *shall not* depart from the right way. In the present mental and bodily condition of mankind it may not be in the power even of the most highly-educated and most pains-taking mother to rear her children to be *all* that she would desire. Bitter disappointment must at times attend even her most Christian efforts; for both before and after the birth of her babes, there will be strong influences at work besides her own—influences over which she may have no control; still, it is scarcely possible to over-rate the importance of *her* mission who at all times possesses power to *diminish* evil and *foster the growth of moral good*. "I contend," writes an eminent physician, "that parents, especially *mothers*, whose responsibility to God and society for the conduct of their children is unspeakably weighty—I contend that they have it in their power to do for the morality of the country *ten-thousand-fold more than all our teachers of theology, literature, and science, and all our pastors of churches united*."[2] Few who look deeply into the matter, will consider this as too strong language.

* "All parts of the body were originally *blood*; or at least they were brought to the growing organs by means of this fluid."—*Liebig's Animal Chemistry, p.* 8.

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[2] Thoughts on Physical Education and the True Mode of Improving the Condition of Man, by Charles Caldwell, M.D., Professor of Medical Jurisprudence, &c., Louisville, Kentucky, 2nd British ed., p. 14.

the highest importance; since it is clear that *Every thing which tends to render the blood unhealthy, tends to affect injuriously all man's organs.* Now, the blood, after having circulated through the body and parted with its life-giving properties, has (supposing the system to be doing its duty) its elements of nutrition restored by commingling with a certain juice called *chyle,* created in the stomach and intestines from the digested food. These commingled fluids (already possessed of the germs of life through the peculiar properties of the chyle) are then caused to traverse the innumerable vessels of the lungs, where, acted-upon by the oxygen of the atmosphere, they become endowed with *perfect vitality.* Permit me to draw your particular attention to this fact;—Under the action of respiration, the chyle, which was once dead food, becomes endowed with *perfect vitality;* the blood, which was before lifeless, regains a *perfect vitality:* in fact, these fluids are now converted into living blood fitted to re-build as before whatever portions of man's system may be consumed by thought, word, or action. We see, then, that the germs of life in the blood are derived from the chyle; and that these germs are endowed with perfect vitality by the respiration of pure air: plainly, therefore, the healthy character of the blood must depend upon the *healthy character of the chyle,* and the respiration of *pure air.* Now, the healthy character of this chyle depends upon the health of the digestive organs: the healthy character of the blood, therefore, must depend upon the *health of the digestive organs* and the respiration of *pure air.* But the health of the digestive organs depends upon a regular and adequate supply of wholesome nourishment accompanied by due exercise of body:* the

* It is shown in the Fourth Lecture of the Series that without due attention to diet and bodily exercise, it is *impossible* for digestion to continue sound; and, consequently, *impossible* for the system to be furnished with regular supplies of perfectly-elaborated chyle.

healthy character of the blood, therefore, must depend upon *pure air*, *proper diet*, and *due bodily exercise*. But the healthful exercise of the body must ever depend upon the healthful exercise of the mind, since every voluntary movement of the body arises from mental impulse:* most clearly, then, the healthy character of the blood must depend upon *pure air*, *proper diet*, *due exercise of body*, and *due exercise of mind*: and since it has been made manifest that "every thing which tends to render the blood unhealthy tends to affect injuriously all man's organs," it becomes equally manifest that *any infringement whatever* of the laws of diet, or of respiration, or of bodily or mental exercise, must be, in a greater or less degree, an injury to man's *entire system*.

But further:—Physiology has demonstrated that *due exercise of any organ strengthens that organ*; and on considering the question, *How may due exercise be given to* ALL *man's organs?* the answer which presents itself to the mind is, *By the uninterrupted working of these very laws, the observance of which we see to be absolutely requisite for the health of the blood.* A very little reflection will serve to show that by the uninterrupted working of the laws of diet, respiration, bodily exercise, and mental exercise, every organ—every power and function of the human frame, cannot but be rendered duly active; *nor is it* POSSIBLE *for them to be rendered duly active if any one of these laws be broken.* An observance of the law of diet brings the stomach and all the many and various organs connected with nutrition into due

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* "The healthful results of complete cheerful exertion," writes Dr. Combe, "will *never* be obtained where the nervous impulse which animates the muscles is denied." "In *mind*," as Mr. Wilson observes, "lies the great secret of *beneficial* exercise, and without it, exercise is a misnomer, and a fraud on the constitution."—(The reader's attention is called to this important point in Lecture III.)—*Physiology applied to Health and Education, by Dr. Andrew Combe, M.D. &c., 14th ed., p.* 105; and *A Treatise on the Management of the Skin and Hair in Relation to Health, by Erasmus Wilson, F.R.S., 3rd ed., p.* 117.

activity:* an observance of the law of respiration implies due activity of the respiratory organs† under the influence of pure air: an observance of the law of bodily exercise, while strengthening the action of the nutritive and respiratory organs, brings into due activity nerves, muscles, bones, ligaments, cartilages, arteries, capillaries, veins, the heart, the skin, and myriads of other organs,‡ none of which can be fully exercised save under the influence of muscular exertion: an observance of the law of mental exercise necessitates a due and healthful action of all the mental powers: moreover, during all these observances it is impossible not to give due exercise to the facial nerves and muscles, the organs of speech, and the organs of the various senses. Now, mark the wisdom, love, and justice of this arrangement;—That self-same mode of living which causes every organ in the human economy to be duly exercised, is the certain means, and at the same time the only means, of creating healthy blood by which those very organs are strengthened—in return, as it were, for duties performed: while any deviation whatever from the proper way of life must more or less deteriorate the blood, so that the creature having transgressed the laws which should govern its action, is, in consequence, mended more or less imperfectly according to the measure of the transgression. Thus, by acting under God's beautiful laws, each organ of the system creates its own reward: by infringing these laws, it creates its own

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* Such, for instance, as the liver, the pancreas, the smaller and larger intestines, the lacteal absorbents, the mesenteric glands, the lymphatics, the kidneys, &c.

† By which is meant not simply the lungs, with their millions of air-cells, but the larynx, trachea, bronchial tubes, diaphragm, &c.

‡ Of secreting organs alone the human frame contains *myriads* which can only be duly exercised when the body is duly exercised:—"All the organs of locomotion—every point of the surface of every muscle, and a great part of the surface and substance of the very bones, are crowded with them."—*Smith's Philosophy of Health, vol.* ii. § 743.

punishment. Every such infringement must tend in a two-fold manner to injure the constitution;—First, because by such infringement various organs are sure to be weakened either by too much exercise or by too great inactivity; and secondly, because the blood is sure to become deteriorated, to the certain injury of the whole vital structure—nourished, be it remembered, *entirely by this vital fluid.*

Once again, then, let it be observed that it is no more possible for man to infringe a law of being and escape the punishment, than it is to obey the laws of being and not be benefited. For perseverance in the right course his reward is *health*, and all the blessings that health brings; while every wandering from the way tends to disqualify him for duty, to induce pain and disease and general unhappiness, to shorten life—in a word, is an enemy to his physical, intellectual, and moral development, an enemy to his *education.*

A few words more are necessary. Since the uninterrupted working of the laws of diet, bodily exercise, respiration, and mental exercise, is certain to give due activity to all man's organs, and, at the same time, to maintain the blood in health; and since due activity of all man's organs accompanied by healthy blood, is all that is requisite for the health of those organs, it would appear that the uninterrupted working of these four laws is all that is requisite for man's perfect development—in other words, man's perfect education: and such undoubtedly is the fact. But this argument must not for one moment be supposed to over-look the vast importance of sleep, cleanliness, clothing, fair day-light, and other known requisites for health. Without due sleep it is evident that, to say the least, there will be an interference with the working of the law of mental exercise; for during wakefulness the brain is ever busy: a too-long-protracted wakefulness,

therefore, is sure to cause it to be over-taxed in some or other of its functions. Again, unless the skin be well cleansed and clothed, it refuses to act under the constant stimulus which obedience to the four laws, but more particularly the law of bodily exercise, is designed to give—in other words, without due attention to cleanliness and clothing, the law of bodily exercise, to say the least, is interrupted in its working. Whether the only object of sleep be to hinder the brain and nervous system from being over-taxed, or whether inattention to cleanliness and clothing acts in any other way than as an impediment to the functional activity of the skin, is nothing to our present purpose. Enough for the present if we see that without due sleep and due attention to clothing and cleanliness, one or other of the four great laws must be interrupted in its working. And it would be sufficiently easy to show that a deprivation of day-light, a long exposure to dampness, or to too great heat or cold, cannot occur without interrupting the intentions of one or other of these all-important laws; so as to render certain organs of the system too inactive, or cause certain organs to be over-taxed. When affirming, therefore, that the uninterrupted working of the laws of bodily exercise, diet, respiration, and mental exercise, constitutes the perfection of man's education, it will be understood that the affirmation is made with a knowledge of this truth;—that regard must be paid to sleep, cleanliness, clothing, and other known requisites for health, in order that the said laws may work according to the beneficent design of the Creator.

But these and various other matters barely touched-upon this evening, will, it is hoped, be rendered more manifest in subsequent lectures; in the course of which it is proposed to treat separately of those subjects which have been shown to be of such vast educational importance—*exercise of body*, *diet*, *respiration*, and *exercise of mind* or *mental cultivation*; a consi-

deration of these subjects (involving, as they are seen to do, reflections upon *cleanliness, clothing, sleep*, &c.) being no other than a consideration HOW TO LIVE IN ACCORDANCE WITH THE PERFECT LAWS ORDAINED BY A PERFECT GOD FOR THE HAPPINESS OF MAN.*

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* "If anything at all is regarded as a divine gift to man, it is surely reasonable to suppose *happiness* to be a divine gift."—*Aristotle's Ethics*, I. 10.

"Our *happiness* and misery are trusted to our conduct, and made to depend upon it."—*Butler's Analogy of Natural and Revealed Religion* (*People's Edition*), *p.* 24.

"Nothing remains but the supposition that God, when He created the human species, *wished their happiness;* and made for them the provision which He has made, with that view, and for that purpose."—*Paley's Moral and Political Philosophy, chap.* V.

"In a word, God is a being of perfect goodness. He created man *with a design to make him happy.* There is nothing in the universe capable of frustrating his design. However, therefore, that design be opposed; through whatever long or painful discipline man may be conducted to happiness, he *must* finally attain it."—*Smith's Divine Government, 4th ed., p.* 204.

LONDON: PRINTED BY W. CLOWES AND SONS, STAMFORD STREET AND CHARING CROSS.

PLAIN AND SIMPLE LECTURES ON EDUCATION,

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(Written with a view to delivery in London.)

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"But it may be asked, is there a royal road to science? Is the popularization of science possible? Does not every attempt to realize this desideratum result in a superficial, perhaps in a deceptive, representation of its principles? It is too true that the unsuccessful essays in this department of literature have done much to discredit its cultivation. It is not every mind which possesses the original energy, the independence of action, to walk scientifically without scientific stays, to abstract scientific principles safe and sound from the technical investment of language appropriate to it. Nevertheless, it is only necessary to look at the works of art which on every hand surround us, to become aware that, to all practical intents and purposes, science may be generalized.

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* Lecture on Respiration.