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PREFACE.

THE four chapters of which this work consists, originally appeared as four Review-articles: the first in the *Westminster Review* for July, 1859; the second in the *North British Review* for May, 1854; and the remaining two in the *British Quarterly Review*, for April, 1858, and for April, 1859. Severally treating different divisions of the subject, but together forming a tolerably complete whole, I originally wrote them with a view to their republication in a united form; and they would some time since have thus been issued, had not a legal difficulty stood in the way. This difficulty being now removed, I hasten to fulfil the intention with which they were written.

That in their first shape these chapters were severally independent, is the reason to be assigned for some slight

repetitions which occur in them: one leading idea, more especially, re-appearing twice. As, however, this idea is on each occasion presented under a new form, and as it can scarcely be too much enforced, I have not thought well to omit any of the passages embodying it.

Some additions of importance will be found in the chapter on Intellectual Education; and in the one on Physical Education there are a few minor alterations. But the chief changes which have been made, are changes of expression: all of the essays having undergone a careful verbal revision.

H. S.

London, May, 1861.

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Education at Eton, 1842–5.

"Balston, our tutor, was a good scholar after the fashion of the day, and famous for Latin verse; but he was essentially a commonplace don. 'Stephen major,' he once said to my brother, 'if you do not take more pains, how can you ever expect to write good longs and shorts? If you do not write good longs and shorts, how can you ever be a man of taste? If you are not a man of taste, how can you ever hope to be of use in the world?'"

(*The Life of Sir James Fitzjames Stephen, Bart.*, by his brother, Leslie Stephen, pp. 80–1.)

EDUCATION.

CHAPTER I.

WHAT KNOWLEDGE IS OF MOST WORTH?

It has been truly remarked that, in order of time, decoration precedes dress. Among people who submit to great physical suffering that they may have themselves handsomely tattooed, extremes of temperature are borne with but little attempt at mitigation. Humboldt tells us that an Orinoco Indian, though quite regardless of bodily comfort, will yet labour for a fortnight to purchase pigment wherewith to make himself admired; and that the same woman who would not hesitate to leave her hut without a fragment of clothing on, would not dare to commit such a breach of decorum as to go out unpainted. Voyagers find that coloured beads and trinkets are much more prized by wild tribes, than are calicoes or broadcloths. And the anecdotes we have of the ways in which, when shirts and coats are given, savages turn them to some ludicrous display, show how completely the idea of ornament predominates over that of use. Nay, there are still more extreme illustrations: witness the fact narrated by Capt. Speke of his African attendants, who strutted about in their goat-skin mantles when the weather was fine, but when it was wet, took them off, folded them up, and went about

naked, shivering in the rain! Indeed, the facts of aboriginal life seem to indicate that dress is developed out of decorations. And when we remember that even among ourselves most think more about the fineness of the fabric than its warmth, and more about the cut than the convenience—when we see that the function is still in great measure subordinated to the appearance—we have further reason for inferring such an origin.

It is curious that the like relations hold with the mind. Among mental as among bodily acquisitions, the ornamental comes before the useful. Not only in times past, but almost as much in our own era, that knowledge which conduces to personal well-being has been postponed to that which brings applause. In the Greek schools, music, poetry, rhetoric, and a philosophy which, until Socrates taught, had but little bearing upon action, were the dominant subjects; while knowledge aiding the arts of life had a very subordinate place. And in our own universities and schools at the present moment, the like antithesis holds. We are guilty of something like a platitude when we say that throughout his after-career, a boy, in nine cases out of ten, applies his Latin and Greek to no practical purposes. The remark is trite that in his shop, or his office, in managing his estate or his family, in playing his part as director of a bank or a railway, he is very little aided by this knowledge he took so many years to acquire—so little, that generally the greater part of it drops out of his memory; and if he occasionally vents a Latin quotation, or alludes to some Greek myth, it is less to throw light on the topic in hand than for the sake of effect. If we inquire what is the real motive for giving boys a classical education, we find it to be simply conformity to public opinion. Men dress their children's minds as they do their bodies, in the prevailing fashion. As the Orinoco Indian puts on paint before leaving his hut, not with a view to any direct benefit, but because he would be ashamed to be seen without it; so, a boy's drilling in Latin and Greek is insisted

on, not because of their intrinsic value, but that he may not be disgraced by being found ignorant of them—that he may have "the education of a gentleman"—the badge marking a certain social position, and bringing a consequent respect.

This parallel is still more clearly displayed in the case of the other sex. In the treatment of both mind and body, the decorative element has continued to predominate in a greater degree among women than among men. Originally, personal adornment occupied the attention of both sexes equally. in these latter days of civilization, however, we see that in the dress of men the regard for appearance has in a considerable degree yielded to the regard for comfort; while in their education the useful has of late been trenching on the ornamental. In neither direction has this change gone so far with women. The wearing of ear-rings, finger-rings, bracelets; the elaborate dressings of the hair; the still occasional use of paint; the immense labour bestowed in making habiliments sufficiently attractive; and the great discomfort that will be submitted to for the sake of conformity; show how greatly, in the attiring of women, the desire of approbation overrides the desire for warmth and convenience. And similarly in their education, the immense preponderance of "accomplishments" proves how here, too, use is subordinated to display. Dancing, deportment, the piano, singing, drawing—what a large space do these occupy! If you ask why Italian and German are learnt, you will find that, under all the sham reasons given, the real reason is, that a knowledge of those tongues is thought ladylike. It is not that the books written in them may be utilized, which they scarcely ever are; but that Italian and German songs may be sung, and that the extent of attainment may bring whispered admiration. The births, deaths, and marriages of kings, and other like historic trivialities, are committed to memory, not because of any direct benefits that can possibly result from knowing them; but because society considers them parts of a good education —because the absence of such knowledge may bring the con-

tempt of others. When we have named reading, writing, spelling, grammar, arithmetic, and sewing, we have named about all the things a girl is taught with a view to their actual uses in life; and even some of these have more reference to the good opinion of others than to immediate personal welfare.

Thoroughly to realize the truth that with the mind as with the body the ornamental precedes the useful, it is requisite to glance at its rationale. This lies in the fact that, from the far past down even to the present, social needs have subordinated individual needs, and that the chief social need has been the control of individuals. It is not, as we commonly suppose, that there are no governments but those of monarchs, and parliaments, and constituted authorities. These acknowledged governments are supplemented by other unacknowledged ones, that grow up in all circles, in which every man or woman strives to be king or queen or lesser dignitary. To get above some and be reverenced by them, and to propitiate those who are above us, is the universal struggle in which the chief energies of life are expended. By the accumulation of wealth, by style of living, by beauty of dress, by display of knowledge or intellect, each tries to subjugate others; and so aids in weaving that ramified network of restraints by which society is kept in order. It is not the savage chief only, who, in formidable war-paint, with scalps at his belt, aims to strike awe into his inferiors; it is not only the belle who, by elaborate toilet, polished manners, and numerous accomplishments, strives to "make conquests;" but the scholar, the historian, the philosopher, use their acquirements to the same end. We are none of us content with quietly unfolding our own individualities to the full in all directions; but have a restless craving to impress our individualities upon others, and in some way subordinate them. And this it is which determines the character of our education. Not what knowledge is of most real worth, is the consideration; but what will bring most applause, honour, respect—what will most

conduce to social position and influence—what will be most imposing. As, throughout life, not what we are, but what we shall be thought, is the question; so in education, the question is, not the intrinsic value of knowledge, so much as its extrinsic effects on others. And this being our dominant idea, direct utility is scarcely more regarded than by the barbarian when filing his teeth and staining his nails.

If there requires further evidence of the rude, undeveloped character of our education, we have it in the fact that the comparative worths of different kinds of knowledge have been as yet scarcely even discussed—much less discussed in a methodic way with definite results. Not only is it that no standard of relative values has yet been agreed upon; but the existence of any such standard has not been conceived in a clear manner. And not only is it that the existence of such a standard has not been clearly conceived; but the need for it seems to have been scarcely even felt. Men read books on this topic, and attend lectures on that; decide that their children shall be instructed in these branches of knowledge, and shall not be instructed in those; and all under the guidance of mere custom, or liking, or prejudice; without ever considering the enormous importance of determining in some rational way what things are really most worth learning. It is true that in all circles we hear occasional remarks on the importance of this or the other order of information. But whether the degree of its importance justifies the expenditure of the time needed to acquire it; and whether there are not things of more importance to which such time might be better devoted; are queries which, if raised at all, are disposed of quite summarily, according to personal predilections. It is true also, that now and then, we hear revived the standing controversy respecting the comparative merits of classics and mathematics. This controversy, however, is carried on in an empirical manner, with no reference to an ascertained criterion; and the question at issue is insignificant when com-

pared with the general question of which it is part. To suppose that deciding whether a mathematical or a classical education is the best, is deciding what is the proper *curriculum*, is much the same thing as to suppose that the whole of dietetics lies in ascertaining whether or not bread is more nutritive than potatoes!

The question which we contend is of such transcendent moment, is, not whether such or such knowledge is of worth, but what is its *relative* worth? When they have named certain advantages which a given course of study has secured them, persons are apt to assume that they have justified themselves: quite forgetting that the adequateness of the advantages is the point to be judged. There is, perhaps, not a subject to which men devote attention that has not *some* value. A year diligently spent in getting up heraldry, would very possibly give a little further insight into ancient manners and morals. Any one who should learn the distances between all the towns in England, might, in the course of his life, find one or two of the thousand facts he had acquired of some slight service when arranging a journey. Gathering together all the small gossip of a county, profitless occupation as it would be, might yet occasionally help to establish some useful fact—say, a good example of hereditary transmission. But in these cases, every one would admit that there was no proportion between the required labour and the probable benefit. No one would tolerate the proposal to devote some years of a boy's time to getting such information, at the cost of much more valuable information which he might else have got. And if here the test of relative value is appealed to and held conclusive, then should it be appealed to and held conclusive throughout. Had we time to master all subjects we need not be particular. To quote the old song:—

> Could a man be secure
> That his days would endure
> As of old, for a thousand long years,
> What things might he know!

What deeds might he do!
And all without hurry or care.

"But we that have but span-long lives" must ever bear in mind our limited time for acquisition. And remembering how narrowly this time is limited, not only by the shortness of life, but also still more by the business of life, we ought to be especially solicitous to employ what time we have to the greatest advantage. Before devoting years to some subject which fashion or fancy suggests, it is surely wise to weigh with great care the worth of the results, as compared with the worth of various alternative results which the same years might bring if otherwise applied.

In education, then, this is the question of questions, which it is high time we discussed in some methodic way. The first in importance, though the last to be considered, is the problem—how to decide among the conflicting claims of various subjects on our attention. Before there can be a rational *curriculum*, we must settle which things it most concerns us to know; or, to use a word of Bacon's, now unfortunately obsolete—we must determine the relative values of knowledges.

To this end, a measure of value is the first requisite. And happily, respecting the true measure of value, as expressed in general terms, there can be no dispute. Every one in contending for the worth of any particular order of information, does so by showing its bearing upon some part of life. In reply to the question—"Of what use is it?" the mathematician, linguist, naturalist, or philosopher, explains the way in which his learning beneficially influences action—saves from evil or secures good—conduces to happiness. When the teacher of writing has pointed out how great an aid writing is to success in business—that is, to the obtainment of sustenance—that is, to satisfactory living; he is held to have proved his case. And when the collector of dead facts (say a numismatist) fails to make clear any appreciable effects which these facts can produce on human welfare, he is obliged to admit

that they are comparatively valueless. All then, either directly or by implication, appeal to this as the ultimate test.

How to live?—that is the essential question for us. Not how to live in the mere material sense only, but in the widest sense. The general problem which comprehends every special problem is—the right ruling of conduct in all directions under all circumstances. In what way to treat the body; in what way to treat the mind; in what way to manage our affairs; in what way to bring up a family; in what way to behave as a citizen; in what way to utilize those sources of happiness which nature supplies—how to use all our faculties to the greatest advantage of ourselves and others—how to live completely? And this being the great thing needful for us to learn, is, by consequence, the great thing which education has to teach. To prepare us for complete living is the function which education has to discharge; and the only rational mode of judging of an educational course is, to judge in what degree it discharges such function.

This test, never used in its entirety, but rarely even partially used, and used then in a vague, half conscious way, has to be applied consciously, methodically, and throughout all cases. It behoves us to set before ourselves, and ever to keep clearly in view, complete living as the end to be achieved; so that in bringing up our children we may choose subjects and methods of instruction, with deliberate reference to this end. Not only ought we to cease from the mere unthinking adoption of the current fashion in education, which has no better warrant than any other fashion; but we must also rise above that rude, empirical style of judging displayed by those more intelligent people who do bestow some care in overseeing the cultivation of their children's minds. It must not suffice simply to *think* that such or such information will be useful in after life, or that this kind of knowledge is of more practical value than that; but we must seek out some process of estimating their respective values, so that as far as possible we may positively *know* which are most deserving of attention.

Doubtless the task is difficult—perhaps never to be more than approximately achieved. But, considering the vastness of the interests at stake, its difficulty is no reason for pusillanimously passing it by; but rather for devoting every energy to its mastery. And if we only proceed systematically, we may very soon get at results of no small moment.

Our first step must obviously be to classify, in the order of their importance, the leading kinds of activity which constitute human life. They may be naturally arranged into:—1. those activities which directly minister to self-preservation; 2. those activities which, by securing the necessaries of life, indirectly minister to self-preservation; 3. those activities which have for their end the rearing and discipline of offspring; 4. those activities which are involved in the maintenance of proper social and political relations; 5. those miscellaneous activities which fill up the leisure part of life, devoted to the gratification of the tastes and feelings.

That these stand in something like their true order of subordination, it needs no long consideration to show. The actions and precautions by which, from moment to moment, we secure personal safety, must clearly take precedence of all others. Could there be a man, ignorant as an infant of surrounding objects and movements, or how to guide himself among them, he would pretty certainly lose his life the first time he went into the street; notwithstanding any amount of learning he might have on other matters. And as entire ignorance in all other directions would be less promptly fatal than entire ignorance in this direction, it must be admitted that knowledge immediately conducive to self-preservation is of primary importance.

That next after direct self-preservation comes the indirect self-preservation which consists in acquiring the means of living, none will question. That a man's industrial functions must be considered before his parental ones, is manifest from the fact that, speaking generally, the discharge of the parental functions is made possible only by the previous discharge of

the industrial ones. The power of self-maintenance necessarily preceding the power of maintaining offspring, it follows that knowledge needful for self-maintenance has stronger claims than knowledge needful for family welfare—is second in value to none save knowledge needful for immediate self-preservation.

As the family comes before the State in order of time—as the bringing up of children is possible before the State exists, or when it has ceased to be, whereas the State is rendered possible only by the bringing up of children; it follows that the duties of the parent demand closer attention than those of the citizen. Or, to use a further argument—since the goodness of a society ultimately depends on the nature of its citizens; and since the nature of its citizens is more modifiable by early training than by anything else; we must conclude that the welfare of the family underlies the welfare of society. And hence knowledge directly conducing to the first, must take precedence of knowledge directly conducing to the last.

Those various forms of pleasurable occupation which fill up the leisure left by graver occupations—the enjoyments of music, poetry, painting, &c.—manifestly imply a pre-existing society. Not only is a considerable development of them impossible without a long-established social union; but their very subject-matter consists in great part of social sentiments and sympathies. Not only does society supply the conditions to their growth; but also the ideas and sentiments they express. And, consequently, that part of human conduct which constitutes good citizenship, is of more moment than that which goes out in accomplishments or exercise of the tastes; and, in education, preparation for the one must rank before preparation for the other.

Such then, we repeat, is something like the rational order of subordination:—That education which prepares for direct self-preservation; that which prepares for indirect self-preservation; that which prepares for parenthood; that which prepares for citizenship; that which prepares for the miscel-

laneous refinements of life. We do not mean to say that these divisions are definitely separable. We do not deny that they are intricately entangled with each other, in such way that there can be no training for any that is not in some measure a training for all. Nor do we question that of each division there are portions more important than certain portions of the preceding divisions: that, for instance, a man of much skill in business but little other faculty, may fall further below the standard of complete living than one of but moderate ability in money-getting but great judgment as a parent; or that exhaustive information bearing on right social action, joined with entire want of general culture in literature and the fine arts, is less desirable than a more moderate share of the one joined with some of the other. But, after making due qualifications, there still remain these broadly-marked divisions; and it still continues substantially true that these divisions subordinate one another in the foregoing order, because the corresponding divisions of life make one another *possible* in that order.

Of course the ideal of education is—complete preparation in all these divisions. But failing this ideal, as in our phase of civilization every one must do more or less, the aim should be to maintain *a due proportion* between the degrees of preparation in each. Not exhaustive cultivation in any one, supremely important though it may be—not even an exclusive attention to the two, three, or four divisions of greatest importance; but an attention to all:—greatest where the value is greatest; less where the value is less; least where the value is least. For the average man (not to forget the cases in which peculiar aptitude for some one department of knowledge, rightly makes pursuit of that one the bread-winning occupation)—for the average man, we say, the desideratum is, a training that approaches nearest to perfection in the things which most subserve complete living, and falls more and more below perfection in the things that have more and more remote bearings on complete living.

In regulating education by this standard, there are some general considerations that should be ever present to us. The worth of any kind of culture, as aiding complete living, may be either necessary or more or less contingent. There is knowledge of intrinsic value; knowledge of quasi-intrinsic value; and knowledge of conventional value. Such facts as that sensations of numbness and tingling commonly precede paralysis, that the resistance of water to a body moving through it varies as the square of the velocity, that chlorine is a disinfectant,—these, and the truths of Science in general, are of intrinsic value: they will bear on human conduct ten thousand years hence as they do now. The extra knowledge of our own language, which is given by an acquaintance with Latin and Greek, may be considered to have a value that is quasi-intrinsic: it must exist for us and for other races whose languages owe much to these sources; but will last only as long as our languages last. While that kind of information which, in our schools, usurps the name History—the mere tissue of names and dates and dead unmeaning events—has a conventional value only: it has not the remotest bearing on any of our actions; and is of use only for the avoidance of those unpleasant criticisms which current opinion passes upon its absence. Of course, as those facts which concern all mankind throughout all time must be held of greater moment than those which concern only a portion of them during a limited era, and of far greater moment than those which concern only a portion of them during the continuance of a fashion; it follows that in a rational estimate, knowledge of intrinsic worth must, other things equal, take precedence of knowledge that is of quasi-intrinsic or conventional worth.

One further preliminary. Acquirement of every kind has two values—value as *knowledge* and value as *discipline*. Besides its use for guiding conduct, the acquisition of each order of facts has also its use as mental exercise; and its effects as a preparative for complete living have to be considered under both these heads.

These, then, are the general ideas with which we must set out in discussing a *curriculum*:—Life as divided into several kinds of activity of successively decreasing importance; the worth of each order of facts as regulating these several kinds of activity, intrinsically, quasi-intrinsically, and conventionally; and their regulative influences estimated both as knowledge and discipline.

Happily, that all-important part of education which goes to secure direct self-preservation, is in great part already provided for. Too momentous to be left to our blundering, Nature takes it into her own hands. While yet in its nurse's arms, the infant, by hiding its face and crying at the sight of a stranger, shows the dawning instinct to attain safety by flying from that which is unknown and may be dangerous; and when it can walk, the terror it manifests if an unfamiliar dog comes near, or the screams with which it runs to its mother after any startling sight or sound, shows this instinct further developed. Moreover, knowledge subserving direct self-preservation is that which it is chiefly busied in acquiring from hour to hour. How to balance its body; how to control its movements so as to avoid collisions; what objects are hard, and will hurt if struck; what objects are heavy, and injure if they fall on the limbs; which things will bear the weight of the body, and which not; the pains inflicted by fire, by missiles, by sharp instruments—these, and various other pieces of information needful for the avoidance of death or accident, it is ever learning. And when, a few years later, the energies go out in running, climbing, and jumping, in games of strength and games of skill, we see in all these actions by which the muscles are developed, the perceptions sharpened, and the judgment quickened, a preparation for the safe conduct of the body among surrounding objects and movements; and for meeting those greater dangers that occasionally occur in the lives of all. Being thus, as we say, so well cared for by Nature, this fundamental education

needs comparatively little care from us. What we are chiefly called upon to see, is, that there shall be free scope for gaining this experience and receiving this discipline—that there shall be no such thwarting of Nature as that by which stupid schoolmistresses commonly prevent the girls in their charge from the spontaneous physical activities they would indulge in; and so render them comparatively incapable of taking care of themselves in circumstances of peril.

This, however, is by no means all that is comprehended in the education that prepares for direct self-preservation. Besides guarding the body against mechanical damage or destruction, it has to be guarded against injury from other causes—against the disease and death that follow breaches of physiologic law. For complete living it is necessary, not only that sudden annihilations of life shall be warded off; but also that there shall be escaped the incapacities and the slow annihilation which unwise habits entail. As, without health and energy, the industrial, the parental, the social, and all other activities become more or less impossible; it is clear that this secondary kind of direct self-preservation is only less important than the primary kind; and that knowledge tending to secure it should rank very high.

It is true that here, too, guidance is in some measure ready supplied. By our various physical sensations and desires, Nature has insured a tolerable conformity to the chief requirements. Fortunately for us, want of food, great heat, extreme cold, produce promptings too peremptory to be disregarded. And would men habitually obey these and all like promptings when less strong, comparatively few evils would arise. If fatigue of body or brain were in every case followed by desistance; if the oppression produced by a close atmosphere always led to ventilation; if there were no eating without hunger, or drinking without thirst; then would the system be but seldom out of working order. But so profound an ignorance is there of the laws of life, that men do not even know that their sensations are their natural guides,

and (when not rendered morbid by long-continued disobedience) their trustworthy guides. So that though, to speak teleologically, Nature has provided efficient safeguards to health, lack of knowledge makes them in a great measure useless.

If any one doubts the importance of an acquaintance with the principles of physiology, as a means to complete living, let him look around and see how many men and women he can find in middle or later life who are thoroughly well. Only occasionally do we meet with an example of vigorous health continued to old age; hourly do meet with examples of acute disorder, chronic ailment, general debility, premature decrepitude. Scarcely is there one to whom you put the question, who has not, in the course of his life, brought upon himself illnesses which a little information would have saved him from. Here is a case of heart-disease consequent on a rheumatic fever that followed reckless exposure. There is a case of eyes spoiled for life by over-study. Yesterday the account was of one whose long-enduring lameness was brought on by continuing, spite of the pain, to use a knee after it had been slightly injured. And to-day we are told of another who has had to lie by for years, because he did not know that the palpitation he suffered under resulted from overtaxed brain. Now we hear of an irremediable injury which followed some silly feat of strength; and, again, of a constitution that has never recovered from the effects of excessive work needlessly undertaken. While on every side we see the perpetual minor ailments which accompany feebleness. Not to dwell on the pain, the weariness, the gloom, the waste of time and money thus entailed, only consider how greatly ill-health hinders the discharge of all duties—makes business often impossible, and always more difficult; produces an irritability fatal to the right management of children; puts the functions of citizenship out of the question; and makes amusement a bore. Is it not clear that the physical sins—partly our forefathers' and partly our own—

which produce this ill-health, deduct more from complete living than anything else? and to a great extent make life a failure and a burden instead of a benefaction and a pleasure?

Nor is this all. Life, besides being thus immensely deteriorated, is also cut short. It is not true, as we commonly suppose, that after a disorder or disease from which we have recovered, we are as before. No disturbance of the normal course of the functions can pass away and leave things exactly as they were. A permanent damage is done—not immediately appreciable, it may be, but still there; and along with other such items which Nature in her strict account-keeping never drops, it will tell against us to the inevitable shortening of our days. Through the accumulation of small injuries it is that constitutions are commonly undermined, and break down, long before their time. And if we call to mind how far the average duration of life falls below the possible duration, we see how immense is the loss. When, to the numerous partial deductions which bad health entails, we add this great final deduction, it results that ordinarily one-half of life is thrown away.

Hence, knowledge which subserves direct self-preservation by preventing this loss of health, is of primary importance. We do not contend that possession of such knowledge would by any means wholly remedy the evil. It is clear that in our present phase of civilization, men's necessities often compel them to transgress. And it is further clear that, even in the absence of such compulsion, their inclinations would frequently lead them, spite of their convictions, to sacrifice future good to present gratification. But we *do* contend that the right knowledge impressed in the right way would effect much; and we further contend that as the laws of health must be recognized before they can be fully conformed to, the imparting of such knowledge must precede a more rational living —come when that may. We infer that as vigorous health and its accompanying high spirits are larger elements of

happiness than any other things whatever, the teaching how to maintain them is a teaching that yields in moment to no other whatever. And therefore we assert that such a course of physiology as is needful for the comprehension of its general truths, and their bearings on daily conduct, is an all-essential part of a rational education.

Strange that the assertion should need making! Stranger still that it should need defending! Yet are there not a few by whom such a proposition will be received with something approaching to derision. Men who would blush if caught saying Iphigénia instead of Iphigenía, or would resent as an insult any imputation of ignorance respecting the fabled labours of a fabled demi-god, show not the slightest shame in confessing that they do not know where the Eustachian tubes are, what are the actions of the spinal cord, what is the normal rate of pulsation, or how the lungs are inflated. While anxious that their sons should be well up in the superstitions of two thousand years ago, they care not that they should be taught anything about the structure and functions of their own bodies—nay, even wish them not to be so taught. So overwhelming is the influence of established routine! So terribly in our education does the ornamental over-ride the useful!

We need not insist on the value of that knowledge which aids indirect self-preservation by facilitating the gaining of a livelihood. This is admitted by all; and, indeed, by the mass is perhaps too exclusively regarded as the end of education. But while every one is ready to endorse the abstract proposition that instruction fitting youths for the business of life is of high importance, or even to consider it of supreme importance; yet scarcely any inquire what instruction will so fit them. It is true that reading, writing, and arithmetic are taught with an intelligent appreciation of their uses. But when we have said this we have said nearly all. While the great bulk of what else is acquired has no bearing on the industrial activities, an immensity of information that has a

direct bearing on the industrial activities is entirely passed over.

For, leaving out only some very small classes, what are all men employed in? They are employed in the production, preparation, and distribution of commodities. And on what does efficiency in the production, preparation, and distribution of commodities depend? It depends on the use of methods fitted to the respective natures of these commodities; it depends on an adequate acquaintance with their physical, chemical, or vital properties, as the case may be; that is, it depends on Science. This order of knowledge which is in great part ignored in our school-courses, is the order of knowledge underlying the right performance of those processes by which civilized life is made possible. Undeniable as is this truth, there seems to be no living consciousness of it: its very familiarity makes it unregarded. To give due weight to our argument, we must, therefore, realize this truth to the reader by a rapid review of the facts.

Passing over the most abstract science, Logic, on the due guidance by which, however, the large producer or distributor depends, knowingly or unknowingly, for success in his business-forecasts, we come first to Mathematics. Of this, the most general division, dealing with number, guides all industrial activities; be they those by which processes are adjusted, or estimates framed, or commodities bought and sold, or accounts kept. No one needs to have the value of this division of abstract science insisted upon.

For the higher arts of construction, some acquaintance with the more special division of Mathematics is indispensable. The village carpenter, who lays out his work by empirical rules, equally with the builder of a Britannia Bridge, makes hourly reference to the laws of space-relations. The surveyor who measures the land purchased; the architect in designing a mansion to be built on it; the builder when laying out the foundations; the masons in cutting the stones; and the various artizans who put up the

fittings; are all guided by geometrical truths. Railway-making is regulated from beginning to end by geometry: alike in the preparation of plans and sections; in staking out the line; in the mensuration of cuttings and embankments; in the designing and building of bridges, culverts, viaducts, tunnels, stations. Similarly with the harbours, docks, piers, and various engineering and architectural works that fringe the coasts and overspread the country, as well as the mines that run underneath it. And now-a-days, even the farmer, for the correct laying-out of his drains, has recourse to the level—that is, to geometrical principles.

Turn next to the Abstract-Concrete sciences. On the application of the simplest of these, Mechanics, depends the success of modern manufactures. The properties of the lever, the wheel-and-axle, &c., are recognized in every machine, and to machinery in these times we owe all production. Trace the history of the breakfast-roll. The soil out of which it came was drained with machine-made tiles; the surface was turned over by a machine; the wheat was reaped, thrashed, and winnowed by machines; by machinery it was ground and bolted; and had the flour been sent to Gosport, it might have been made into biscuits by a machine. Look round the room in which you sit. If modern, probably the bricks in its walls were machine-made; and by machinery the flooring was sawn and planed, the mantel-shelf sawn and polished, the paper-hangings made and printed. The veneer on the table, the turned legs of the chairs, the carpet, the curtains, are all products of machinery. Your clothing—plain, figured, or printed—is it not wholly woven, nay, perhaps even sewed, by machinery? And the volume you are reading—are not its leaves fabricated by one machine and covered with these words by another? Add to which that for the means of distribution over both land and sea, we are similarly indebted. And then observe that according as knowledge of mechanics is well or ill applied to these ends, comes success or failure. The

engineer who miscalculates the strength of materials, builds a bridge that breaks down. The manufacturer who uses a bad machine cannot compete with another whose machine wastes less in friction and inertia. The ship-builder adhering to the old model, is out-sailed by one who builds on the mechanically-justified wave-line principle. And as the ability of a nation to hold its own against other nations, depends on the skilled activity of its units, we see that on mechanical knowledge may turn the national fate.

On ascending from the divisions of Abstract-Concrete science dealing with molar forces, to those divisions of it which deal with molecular forces, we come to another vast series of applications. To this group of sciences joined with the preceding groups we owe the steam-engine, which does the work of millions of labourers. That section of physics which formulates the laws of heat, has taught us how to economize fuel in various industries; how to increase the produce of smelting furnaces by substituting the hot for the cold blast; how to ventilate mines; how to prevent explosions by using the safety-lamp; and, through the thermometer, how to regulate innumerable processes. That section which has the phenomena of light for its subject, gives eyes to the old and the myopic; aids through the microscope in detecting diseases and adulterations; and, by improved lighthouses, prevents shipwrecks. Researches in electricity and magnetism have saved innumerable lives and incalculable property through the compass; have subserved many arts by the electrotype; and now, in the telegraph, have supplied us with an agency by which for the future, mercantile transactions will be regulated and political intercourse carried on. While in the details of in-door life, from the improved kitchen-range up to the stereoscope on the drawing-room table, the applications of advanced physics underlie our comforts and gratifications.

Still more numerous are the applications of Chemistry. The bleacher, the dyer, the calico-printer, are severally

occupied in processes that are well or ill done according as they do or do not conform to chemical laws. Smelting of copper, tin, zinc, lead, silver, iron, must be guided by chemistry. Sugar-refining, gas-making, soap-boiling, gunpowder-manufacture, are operations all partly chemical; as are likewise those which produce glass and porcelain. Whether the distiller's wort stops at the alcoholic fermentation or passes into the acetous, is a chemical question on which hangs his profit or loss; and the brewer, if his business is extensive, finds it pay to keep a chemist on his premises. Indeed, there is now scarcely any manufacture over some part of which chemistry does not preside. Nay, in these times even agriculture, to be profitably carried on, must have like guidance. The analysis of manures and soils; the disclosure of their respective adaptations; the use of gypsum or other substance for fixing ammonia; the utilization of coprolites; the production of artificial manures —all these are boons of chemistry which it behoves the farmer to acquaint himself with. Be it in the lucifer match, or in disinfected sewage, or in photographs—in bread made without fermentation, or perfumes extracted from refuse, we may perceive that chemistry affects all our industries; and that, therefore, knowledge of it concerns every one who is directly or indirectly connected with our industries.

Of the Concrete sciences, we come first to Astronomy. Out of this has grown that art of navigation which has made possible the enormous foreign commerce that supports a large part of our population, while supplying us with many necessaries and most of our luxuries.

Geology, again, is a science knowledge of which greatly aids industrial success. Now that iron ores are so large a source of wealth; now that the duration of our coal-supply has become a question of great interest; now that we have a College of Mines and a Geological Survey; it is scarcely needful to enlarge on the truth that the study of the Earth's crust is important to our material welfare.

And then the science of life—Biology: does not this, too, bear fundamentally on these processes of indirect self-preservation? With what we ordinarily call manufactures, it has, indeed, little connexion; but with the all-essential manufacture—that of food—it is inseparably connected. As agriculture must conform its methods to the phenomena of vegetal and animal life, it follows that the science of these phenomena is the rational basis of agriculture. Various biological truths have indeed been empirically established and acted upon by farmers, while yet there has been no conception of them as science; such as that particular manures are suited to particular plants; that crops of certain kinds unfit the soil for other crops; that horses cannot do good work on poor food; that such and such diseases of cattle and sheep are caused by such and such conditions. These, and the every-day knowledge which the agriculturist gains by experience respecting the management of plants and animals, constitute his stock of biological facts; on the largeness of which greatly depends his success. And as these biological facts, scanty, indefinite, rudimentary, though they are, aid him so essentially; judge what must be the value to him of such facts when they become positive, definite, and exhaustive. Indeed, even now we may see the benefits that rational biology is conferring on him. The truth that the production of animal heat implies waste of substance, and that, therefore, preventing loss of heat prevents the need for extra food—a purely theoretical conclusion—now guides the fattening of cattle: it is found that by keeping cattle warm, fodder is saved. Similarly with respect to variety of food. The experiments of physiologists have shown that not only is change of diet beneficial, but that digestion is facilitated by a mixture of ingredients in each meal. The discovery that a disorder known as "the staggers," of which many thousands of sheep have died annually, is caused by an entozoon which presses on the brain, and that if the creature is extracted through the softened place in the skull which marks its

position, the sheep usually recovers, is another debt which agriculture owes to biology.

Yet one more science have we to note as bearing directly on industrial success—the Science of Society. Men who daily look at the state of the money-market; glance over prices current; discuss the probable crops of corn, cotton, sugar, wool, silk; weigh the chances of war; and from these data decide on their mercantile operations; are students of social science: empirical and blundering students it may be; but still, students who gain the prizes or are plucked of their profits, according as they do or do not reach the right conclusion. Not only the manufacturer and the merchant must guide their transactions by calculations of supply and demand, based on numerous facts, and tacitly recognizing sundry general principles of social action; but even the retailer must do the like: his prosperity very greatly depending upon the correctness of his judgments respecting the future wholesale prices and the future rates of consumption. Manifestly, whoever takes part in the entangled commercial activities of a community, is vitally interested in understanding the laws according to which those activities vary.

Thus, to all such as are occupied in the production, exchange, or distribution of commodities, acquaintance with Science in some of its departments, is of fundamental importance. Each man who is immediately or remotely implicated in any form of industry, (and few are not,) has in some way to deal with the mathematical, physical, and chemical properties of things; perhaps, also, has a direct interest in biology; and certainly has in sociology. Whether he does or does not succeed well in that indirect self-preservation which we call getting a good livelihood, depends in a great degree on his knowledge of one or more of these sciences: not, it may be, a rational knowledge; but still a knowledge, though empirical. For what we call learning a business, really implies learning the science involved in it; though not perhaps under the name of science. And hence a grounding in science is of

great importance, both because it prepares for all this, and because rational knowledge has an immense superiority over empirical knowledge. Moreover, not only is scientific culture requisite for each, that he may understand the *how* and the *why* of the things and processes with which he is concerned as maker or distributor; but it is often of much moment that he should understand the *how* and the *why* of various other things and processes. In this age of joint-stock undertakings, nearly every man above the labourer is interested as capitalist in some other occupation than his own; and, as thus interested, his profit or loss often depends on his knowledge of the sciences bearing on this other occupation. Here is a mine, in the sinking of which many shareholders ruined themselves, from not knowing that a certain fossil belonged to the old red sand stone, below which no coal is found. Numerous attempts have been made to construct electro-magnetic engines, in the hope of superseding steam; but had those who supplied the money, understood the general law of the correlation and equivalence of forces, they might have had better balances at their bankers. Daily are men induced to aid in carrying out inventions which a mere tyro in science could show to be futile. Scarcely a locality but has its history of fortunes thrown away over some impossible project.

And if already the loss from want of science is so frequent and so great, still greater and more frequent will it be to those who hereafter lack science. Just as fast as productive processes become more scientific, which competition will inevitably make them do; and just as fast as joint-stock undertakings spread, which they certainly will; so fast must scientific knowledge grow necessary to every one.

That which our school-courses leave almost entirely out, we thus find to be that which most nearly concerns the business of life. Our industries would cease, were it not for the information which men begin to acquire, as they best may, after their education is said to be finished. And were it not for this information, from age to age accumulated and

spread by unofficial means, these industries would never have existed. Had there been no teaching but such as goes on in our public schools, England would now be what it was in feudal times. That increasing acquaintance with the laws of phenomena, which has through successive ages enabled us to subjugate Nature to our needs, and in these days gives the common labourer comforts which a few centuries ago kings could not purchase, is scarcely in any degree owed to the appointed means of instructing our youth. The vital knowledge—that by which we have grown as a nation to what we are, and which now underlies our whole existence, is a knowledge that has got itself taught in nooks and corners; while the ordained agencies for teaching have been mumbling little else but deal formulas.

We come now to the third great division of human activities—a division for which no preparation whatever is made. If by some strange chance not a vestige of us descended to the remote future save a pile of our school-books or some college examination-papers, we may imagine how puzzled an antiquary of the period would be on finding in them no sign that the learners were ever likely to be parents. "This must have been the *curriculum* for their celibates," we may fancy him concluding. "I perceive here an elaborate preparation for many things; especially for reading the books of extinct nations and of co-existing nations (from which indeed it seems clear that these people had very little worth reading in their own tongue); but I find no reference whatever to the bringing up of children. They could not have been so absurd as to omit all training for this gravest of responsibilities. Evidently then, this was the school-course of one of their monastic orders."

Seriously, it is not an astonishing fact, that though on the treatment of offspring depend their lives or deaths, and their moral welfare or ruin; yet not one word of instruction on the treatment of offspring is ever given to those who will by

and by be parents? Is it not monstrous that the fate of a new generation should be left to the chances of unreasoning custom, impulse, fancy—joined with the suggestions of ignorant nurses and the prejudiced counsel of grandmothers? If a merchant commenced business without any knowledge of arithmetic and book-keeping, we should exclaim at his folly, and look for disastrous consequences. Or if, before studying anatomy, a man set up as a surgical operator, we should wonder at his audacity and pity his patients. But that parents should begin the difficult task of rearing children, without ever having given a thought to the principles—physical, moral, or intellectual—which ought to guide them, excites neither surprise at the actors nor pity for their victims.

To tens of thousands that are killed, add hundreds of thousands that survive with feeble constitutions, and millions that grow up with constitutions not so strong as they should be; and you will have some idea of the curse inflicted on their offspring by parents ignorant of the laws of life. Do but consider for a moment that the regimen to which children are subject, is hourly telling upon them to their life-long injury or benefit; and that there are twenty ways of going wrong to one way of going right; and you will get some idea of the enormous mischief that is almost everywhere inflicted by the thoughtless, hap-hazard system in common use. Is it decided that a boy shall be clothed in some flimsy short dress, and be allowed to go playing about with limbs reddened by cold? The decision will tell on his whole future existence—either in illnesses; or in stunted growth; or in deficient energy; or in a maturity less vigorous than it ought to have been, and in consequent hindrances to success and happiness. Are children doomed to a monotonous dietary, or a dietary that is deficient in nutritiveness? Their ultimate physical power and their efficiency as men and women, will inevitably be more or less diminished by it. Are they forbidden vociferous play, or (being too ill-clothed to bear exposure), are they kept in-

doors in cold weather? They are certain to fall below that measure of health and strength to which they would else have attained. When sons and daughters grow up sickly and feeble, parents commonly regard the event as a misfortune — as a visitation of Providence. Thinking after the prevalent chaotic fashion, they assume that these evils come without causes; or that the causes are supernatural. Nothing of the kind. In some cases the causes are doubtless inherited; but in most cases foolish regulations are the causes. Very generally, parents themselves are responsible for all this pain, this debility, this depression, this misery. They have undertaken to control the lives of their offspring from hour to hour; with cruel carelessness they have neglected to learn anything about these vital processes which they are unceasingly affecting by their commands and prohibitions; in utter ignorance of the simplest physiologic laws, they have been year by year undermining the constitutions of their children; and have so inflicted disease and premature death, not only on them but on their descendants.

Equally great are the ignorance and the consequent injury, when we turn from physical training to moral training. Consider the young mother and her nursery-legislation. But a few years ago she was at school, where her memory was crammed with words, and names, and dates, and her reflective faculties scarcely in the slightest degree exercised—where not one idea was given her respecting the methods of dealing with the opening mind of childhood; and where her discipline did not in the least fit her for thinking out methods of her own. The intervening years have been passed in practising music, in fancy-work, in novel-reading, and in party-going: no thought having yet been given to the grave responsibilities of maternity; and scarcely any of that solid intellectual culture obtained which would be some preparation for such responsibilities. And now see her with an unfolding human character committed to her charge—see her profoundly ignorant of the phenomena with which she has to

deal, undertaking to do that which can be done but imperfectly even with the aid of the profoundest knowledge. She knows nothing about the nature of the emotions, their order of evolution, their functions, or where use ends and abuse begins. She is under the impression that some of the feelings are wholly bad, which is not true of any one of them; and that others are good however far they may be carried, which is also not true of any one of them. And then, ignorant as she is of the structure she has to deal with, she is equally ignorant of the effects produced on it by this or that treatment. What can be more inevitable than the disastrous results we see hourly arising? Lacking knowledge of mental phenomena, with their cause and consequences, her interference is frequently more mischievous than absolute passivity would have been. This and that kind of action, which are quite normal and beneficial, she perpetually thwarts; and so diminishes the child's happiness and profit, injures its temper and her own, and produces estrangement. Deeds which she thinks it desirable to encourage, she gets performed by threats and bribes, or by exciting a desire for applause: considering little what the inward motive may be, so long as the outward conduct conforms; and thus cultivating hypocrisy, and fear, and selfishness, in place of good feeling. While insisting on truthfulness, she constantly sets an example of untruth, by threatening penalties which she does not inflict. While inculcating self-control, she hourly visits on her little ones, angry scoldings for acts undeserving of them. She has not the remotest idea that in the nursery, as in the world, that alone is the truly salutary discipline which visits on all conduct, good and bad, the natural consequences—the consequences, pleasurable or painful, which in the nature of things such conduct tends to bring. Being thus without theoretic guidance, and quite incapable of guiding herself by tracing the mental processes going on in her children, her rule is impulsive, inconsistent, mischievous; and would indeed be generally ruinous, were it not that the overwhelming tend-

ency of the growing mind to assume the moral type of the race, usually subordinates all minor influences.

And then the culture of the intellect—is not this, too, mismanaged in a similar manner? Grant that the phenomena of intelligence conform to laws; grant that the evolution of intelligence in a child also conforms to laws; and it follows inevitably that education cannot be rightly guided without a knowledge of these laws. To suppose that you can properly regulate this process of forming and accumulating ideas, without understanding the nature of the process, is absurd. How widely, then, must teaching as it is, differ from teaching as it should be; when hardly any parents, and but few tutors, know anything about psychology. As might be expected, the established system is grievously at fault, alike in matter and in manner. While the right class of facts is withheld, the wrong class is forcibly administered in the wrong way and in the wrong order. Under that common limited idea of education which confines it to knowledge gained from books, parents thrust primers into the hands of their little ones years too soon, to their great injury. Not recognizing the truth that the function of books is supplementary—that they form an indirect means to knowledge when direct means fail—a means of seeing through other men what you cannot see for yourself; teachers are eager to give second-hand facts in place of first-hand facts. Not perceiving the enormous value of that spontaneous education which goes on in early years—not perceiving that a child's restless observation, instead of being ignored or checked, should be diligently ministered to, and made as accurate and complete as possible; they insist on occupying its eyes and thoughts with things that are, for the time being, incomprehensible and repugnant. Possessed by a superstition which worships the symbols of knowledge instead of the knowledge itself, they do not see that only when his acquaintance with the objects and processes of the household, the streets, and the fields, is becoming tolerably exhaustive—only then should a child be

introduced to the new sources of information which books supply: and this, not only because immediate cognition is of far greater value than mediate cognition; but also, because the words contained in books can be rightly interpreted into ideas, only in proportion to the antecedent experience of things. Observe next, that this formal instruction, far too soon commenced, is carried on with but little reference to the laws of mental development. Intellectual progress is of necessity from the concrete to the abstract. But regardless of this, highly abstract studies, such as grammar, which should come quite late, are begun quite early. Political geography, dead and uninteresting to a child, and which should be an appendage of sociological studies, is commenced betimes; while physical geography, comprehensible and comparatively attractive to a child, is in great part passed over. Nearly every subject dealt with is arranged in abnormal order: definitions and rules and principles being put first, instead of being disclosed, as they are in the order of nature, through the study of cases. And then, pervading the whole, is the vicious system of rote learning—a system of sacrificing the spirit to the letter. See the results. What with perceptions unnaturally dulled by early thwarting, and a coerced attention to books—what with the mental confusion produced by teaching subjects before they can be understood, and in each of them giving generalizations before the facts of which they are the generalizations—what with making the pupil a mere passive recipient of other's ideas, and not in the least leading him to be an active inquirer or self-instructor—and what with taxing the faculties to excess; there are very few minds that become as efficient as they might be. Examinations being once passed, books are laid aside; the greater part of what has been acquired, being unorganized, soon drops out of recollection; what remains is mostly inert—the art of applying knowledge not having been cultivated; and there is but little power either of accurate observation or independent thinking. To all which add, that while much of the inform-

ation gained is of relatively small value, an immense mass of information of transcendent value is entirely passed over.

Thus we find the facts to be such as might have been inferred *à priori*. The training of children—physical, moral, and intellectual—is dreadfully defective. And in great measure it is so, because parents are devoid of that knowledge by which this training can alone be rightly guided. What is to be expected when one of the most intricate of problems is undertaken by those who have given scarcely a thought to the principles on which its solution depends? For shoe-making or house-building, for the management of a ship or a locomotive engine, a long apprenticeship is needful. Is it, then, that the unfolding of a human being in body and mind, is so comparatively simple a process, that any one may superintend and regulate it with no preparation whatever? If not—if the process is, with one exception, more complex than any in Nature, and the task of ministering to it one of surpassing difficulty; is it not madness to make no provision for such a task? Better sacrifice accomplishments than omit this all-essential instruction. When a father, acting on false dogmas adopted without examination, has alienated his sons, driven them into rebellion by his harsh treatment, ruined them, and made himself miserable; he might reflect that the study of Ethology would have been worth pursuing, even at the cost of knowing nothing about Æschylus. When a mother is mourning over a first-born that has sunk under the sequelæ of scarlet-fever—when perhaps a candid medical man has confirmed her suspicion that her child would have recovered had not its system been enfeebled by over-study—when she is prostrate under the pangs of combined grief and remorse; it is but a small consolation that she can read Dante in the original.

Thus we see that for regulating the third great division of human activities, a knowledge of the laws of life is the one thing needful. Some acquaintance with the first principles of physiology and the elementary truths of psychology, is indis-

pensable for the right bringing up of children. We doubt not that many will read this assertion with a smile. That parents in general should be expected to acquire a knowledge of subjects so abstruse, will seem to them an absurdity. And if we proposed that an exhaustive knowledge of these subjects should be obtained by all fathers and mothers, the absurdity would indeed be glaring enough. But we do not. General principles only, accompanied by such illustrations as may be needed to make them understood, would suffice. And these might be readily taught—if not rationally, then dogmatically. Be this as it may, however, here are the indisputable facts:—that the development of children in mind and body follows certain laws; that unless these laws are in some degree conformed to by parents, death is inevitable; that unless they are in a great degree conformed to, there must result serious physical and mental defects; and that only when they are completely conformed to, can a perfect maturity be reached. Judge, then, whether all who may one day be parents, should not strive with some anxiety to learn what these laws are.

From the parental functions let us pass now to the functions of the citizen. We have here to inquire what knowledge fits a man for the discharge of these functions. It cannot be alleged that the need for knowledge fitting him for these functions is wholly overlooked; for our school-courses contain certain studies which, nominally at least, bear upon political and social duties. Of these the only one that occupies a prominent place is History.

But, as already hinted, the information commonly given under this head, is almost valueless for purposes of guidance. Scarcely any of the facts set down in our school-histories, and very few of those contained in the more elaborate works written for adults, illustrate the right principles of political action. The biographies of monarchs (and our children learn little else) throw scarcely any light upon the science of society.

Familiarity with court intrigues, plots, usurpations, or the like, and with all the personalities accompanying them, aids very little in elucidating the causes of national progress. We read of some squabble for power, that it led to a pitched battle; that such and such were the names of the generals and their leading subordinates; that they had each so many thousand infantry and cavalry, and so many cannon; that they arranged their forces in this and that order; that they manœuvred, attacked, and fell back in certain ways; that at this part of the day such disasters were sustained, and at that such advantages gained; that in one particular movement some leading officer fell, while in another a certain regiment was decimated; that after all the changing fortunes of the fight, the victory was gained by this or that army; and that so many were killed and wounded on each side, and so many captured by the conquerors. And now, out of the accumulated details making up the narrative, say which it is that helps you in deciding on your conduct as a citizen. Supposing even that you had diligently read, not only "The Fifteen Decisive Battles of the World," but accounts of all other battles that history mentions; how much more judicious would your vote be at the next election? "But these are facts —interesting facts," you say. Without doubt they are facts (such, at least, as are not wholly or partially fictions); and to many they may be interesting facts. But this by no means implies that they are valuable. Factitious or morbid opinion often gives seeming value to things that have scarcely any. A tulipomaniac will not part with a choice bulb for its weight in gold. To another man an ugly piece of cracked old china seems his most desirable possession. And there are those who give high prices for the relics of celebrated murderers. Will it be contended that these tastes are any measures of value in the things that gratify them? If not, then it must be admitted that the liking felt for certain classes of historical facts is no proof of their worth; and that we must test their worth, as we test the worth of other facts, by asking to what uses they

are applicable. Were some one to tell you that your neighbour's cat kittened yesterday, you would say the information was valueless. Fact though it might be, you would call it an utterly useless fact—a fact that could in no way influence your actions in life—a fact that would not help you in learning how to live completely. Well, apply the same test to the great mass of historical facts, and you will get the same result. They are facts from which no conclusions can be drawn —*unorganizable* facts; and therefore facts of no service in establishing principles of conduct, which is the chief use of facts. Read them, if you like, for amusement; but do not flatter yourself they are instructive.

That which constitutes History, properly so called, is in great part omitted from works on the subject. Only of late years have historians commenced giving us, in any considerable quantity, the truly valuable information. As in past ages the king was everything and the people nothing; so, in past histories the doings of the king fill the entire picture, to which the national life forms but an obscure background. While only now, when the welfare of nations rather than of rulers is becoming the dominant idea, are historians beginning to occupy themselves with the phenomena of social progress. The thing it really concerns us to know, is the natural history of society. We want all facts which help us to understand how a nation has grown and organized itself. Among these, let us of course have an account of its government; with as little as may be of gossip about the men who officered it, and as much as possible about the structure, principles, methods, prejudices, corruptions, &c., which it exhibited: and let this account include not only the nature and actions of the central government, but also those of local governments, down to their minutest ramifications. Let us of course also have a parallel description of the ecclesiastical government—its organization, its conduct, its power, its relations to the State; and accompanying this, the ceremonial, creed, and religious ideas—not only those nominally believed, but those really

believed and acted upon. Let us at the same time be informed of the control exercised by class over class, as displayed in social observances—in titles, salutations, and forms of address. Let us know, too, what were all the other customs which regulated the popular life out of doors and in-doors: including those concerning the relations of the sexes, and the relations of parents to children. The superstitions, also, from the more important myths down to the charms in common use, should be indicated. Next should come a delineation of the industrial system: showing to what extent the division of labour was carried; how trades were regulated, whether by caste, guilds, or otherwise; what was the connection between employers and employed; what were the agencies for distributing commodities; what were the means of communication; what was the circulating medium. Accompanying all which should be given an account of the industrial arts technically considered: stating the processes in use, and the quality of the products. Further, the intellectual condition of the nation in its various grades should be depicted; not only with respect to the kind and amount of education, but with respect to the progress made in science, and the prevailing manner of thinking. The degree of æsthetic culture, as displayed in architecture, sculpture, painting, dress, music, poetry, and fiction, should be described. Nor should there be omitted a sketch of the daily lives of the people—their food, their homes, and their amusements. And lastly, to connect the whole, should be exhibited the morals, theoretical and practical, of all classes: as indicated in their laws, habits, proverbs, deeds. These facts, given with as much brevity as consists with clearness and accuracy, should be so grouped and arranged that they may be comprehended in their *ensemble*, and contemplated as mutually-dependent parts of one great whole. The aim should be so to present them that men may readily trace the *consensus* subsisting among them; with the view of learning what social phenomena co-exist with what others. And then the corresponding delineations

of succeeding ages should be so managed as to show how each belief, institution, custom, and arrangement was modified; and how the *consensus* of preceding structures and functions was developed into the *consensus* of succeeding ones. Such alone is the kind of information respecting past times, which can be of service to the citizen for the regulation of his conduct. The only history that is of practical value, is what may be called Descriptive Sociology. And the highest office which the historian can discharge, is that of so narrating the lives of nations, as to furnish materials for a Comparative Sociology; and for the subsequent determination of the ultimate laws to which social phenomena conform.

But now mark, that even supposing an adequate stock of this truly valuable historical knowledge has been acquired, it is of comparatively little use without the key. And the key is to be found only in Science. In the absence of the generalizations of biology and psychology, rational interpretation of social phenomena is impossible. Only in proportion as men draw certain rude, empirical inferences respecting human nature, are they enabled to understand even the simplest facts of social life: as, for instance, the relation between supply and demand. And if the most elementary truths of sociology cannot be reached until some knowledge is obtained of how men generally think, feel, and act under given circumstances; then it is manifest that there can be nothing like a wide comprehension of sociology, unless through a competent acquaintance with man in all his faculties, bodily and mental. Consider the matter in the abstract, and this conclusion is self-evident. Thus:—Society is made up of individuals; all that is done in society is done by the combined actions of individuals; and therefore, in individual actions only can be found the solutions of social phenomena. But the actions of individuals depend on the laws of their natures; and their actions cannot be understood until these laws are understood. These laws, however, when reduced to their simplest expressions, prove to be corollaries from the laws of body and mind

in general. Hence it follows, that biology and psychology are indispensable as interpreters of sociology. Or, to state the conclusions still more simply:—all social phenomena are phenomena of life—are the most complex manifestations of life—must conform to the laws of life—and can be understood only when the laws of life are understood. Thus, then, for the regulation of this fourth division of human activities, we are, as before, dependent on Science. Of the knowledge commonly imparted in educational courses, very little is of service for guiding a man in his conduct as a citizen. Only a small part of the history he reads is of practical value; and of this small part he is not prepared to make proper use. He lacks not only the materials for, but the very conception of, descriptive sociology; and he also lacks those generalizations of the organic sciences, without which even descriptive sociology can give him but small aid.

And now we come to that remaining division of human life which includes the relaxations and amusements filling leisure hours. After considering what training best fits for self-preservation, for the obtainment of sustenance, for the discharge of parental duties, and for the regulation of social and political conduct; we have now to consider what training best fits for the miscellaneous ends not included in these—for the enjoyments of Nature, of Literature, and of the Fine Arts, in all their forms. Postponing them as we do to things that bear more vitally upon human welfare; and bringing everything, as we have, to the test of actual value; it will perhaps be inferred that we are inclined to slight these less essential things. No greater mistake could be made, however. We yield to none in the value we attach to æsthetic culture and its pleasures. Without painting, sculpture, music, poetry, and the emotions produced by natural beauty of every kind, life would lose half its charm. So far from regarding the training and gratification of the tastes as unimportant, we believe that in time to come they will occupy a much larger

share of human life than now. When the forces of Nature have been fully conquered to man's use—when the means of production have been brought to perfection—when labour has been economized to the highest degree—when education has been so systematized that a preparation for the more essential activities may be made with comparative rapidity—and when, consequently, there is a great increase of spare time; then will the beautiful, both in Art and Nature, rightly fill a large space in the minds of all.

But it is one thing to approve of æsthetic culture as largely conducive to human happiness; and another thing to admit that it is a fundamental requisite to human happiness. However important it may be, it must yield precedence to those kinds of culture which bear directly upon daily duties. As before hinted, literature and the fine arts are made possible by those activities which make individual and social life possible; and manifestly, that which is made possible, must be postponed to that which makes it possible. A florist cultivates a plant for the sake of its flower; and regards the roots and leaves as of value, chiefly because they are instrumental in producing the flower. But while, as an ultimate product, the flower is the thing to which everything else is subordinate, the florist has learnt that the root and leaves are intrinsically of greater importance; because on them the evolution of the flower depends. He bestows every care in rearing a healthy plant; and knows it would be folly if, in his anxiety to obtain the flower, he were to neglect the plant. Similarly in the case before us. Architecture, sculpture, painting, music and poetry, may truly be called the efflorescence of civilized life. But even supposing they are of such transcendent worth as to subordinate the civilized life out of which they grow (which can hardly be asserted), it will still be admitted that the production of a healthy civilized life must be the first consideration; and that culture subserving this must occupy the highest place.

And here we see most distinctly the vice of our educational

system. It neglects the plant for the sake of the flower. In anxiety for elegance, it forgets substance. While it gives no knowledge conducive to self-preservation—while of knowledge that facilitates gaining a livelihood it gives but the rudiments, and leaves the greater part to be picked up any how in after life—while for the discharge of parental functions it makes not the slightest provision—and while for the duties of citizenship it prepares by imparting a mass of facts, most of which are irrelevant, and the rest without a key; it is diligent in teaching whatever adds to refinement, polish, éclat. Fully as we may admit that extensive acquaintance with modern languages is a valuable accomplishment, which, through reading, conversation, and travel, aids in giving a certain finish; it by no means follows that this result is rightly purchased at the cost of the vitally important knowledge sacrificed to it. Supposing it true that classical education conduces to elegance and correctness of style; it cannot be said that elegance and correctness of style are comparable in importance to a familiarity with the principles that should guide the rearing of children. Grant that the taste may be improved by reading the poetry written in extinct languages; yet it is not to be inferred that such improvement of taste is equivalent in value to an acquaintance with the laws of health. Accomplishments, the fine arts, *belles-lettres*, and all those things which, as we say, constitute the efflorescence of civilization, should be wholly subordinate to that instruction and discipline in which civilization rests. *As they occupy the leisure part of life, so should they occupy the leisure part of education.*

Recognizing thus the true position of æsthetics, and holding that while the cultivation of them should form a part of education from its commencement, such cultivation should be subsidiary; we have now to inquire what knowledge is of most use to this end—what knowledge best fits for this remaining sphere of activity? To this question the answer is still the same as heretofore. Unexpected though the assertion may

be, it is nevertheless true, that the highest Art of every kind is based on Science—that without Science there can be neither perfect production nor full appreciation. Science, in that limited acceptation current in society, may not have been possessed by various artists of high repute; but acute observers as such artists have been, they have always possessed a stock of those empirical generalizations which constitute science in its lowest phase; and they have habitually fallen far below perfection, partly because their generalizations were comparatively few and inaccurate. That science necessarily underlies the fine arts, becomes manifest, *à priori*, when we remember that art-products are all more or less representative of objective or subjective phenomena; that they can be good only in proportion as they conform to the laws of these phenomena; and that before they can thus conform, the artist must know what these laws are. That this *à priori* conclusion tallies with experience, we shall soon see.

Youths preparing for the practice of sculpture, have to acquaint themselves with the bones and muscles of the human frame in their distribution, attachments, and movements. This is a portion of science; and it has been found needful to impart it for the prevention of those many errors which sculptors who do not possess it commit. A knowledge of mechanical principles is also requisite; and such knowledge not being usually possessed, grave mechanical mistakes are frequently made. Take an instance. For the stability of a figure it is needful that the perpendicular from the centre of gravity—"the line of direction," as it is called—should fall within the base of support; and hence it happens, that when a man assumes the attitude known as "standing at ease," in which one leg is straightened and the other relaxed, the line of direction falls within the foot of the straightened leg. But sculptors unfamiliar with the theory of equilibrium, not uncommonly so represent this attitude, that the line of direction falls midway between the feet. Ignorance of the law of momentum leads to analogous blunders:

as witness the admired Discobolus, which, as it is posed, must inevitably fall forward the moment the quoit is delivered.

In painting, the necessity for scientific information, empirical if not rational, is still more conspicuous. What gives the grotesqueness to Chinese pictures, unless their utter disregard of the laws of appearances—their absurd linear perspective, and their want of aerial perspective? In what are the drawings of a child so faulty, if not in a similar absence of truth—an absence arising, in great part, from ignorance of the way in which the aspects of things vary with the conditions? Do but remember the books and lectures by which students are instructed; or consider the criticisms of Ruskin; or look at the doings of the Pre-Raffaelites; and you will see that progress in painting implies increasing knowledge of how effects in Nature are produced. The most diligent observation, if unaided by science, fails to preserve from error. Every painter will endorse the assertion that unless it is known what appearances must exist under given circumstances, they often will not be perceived; and to know what appearances must exist, is, in so far, to understand the science of appearances. From want of science Mr. J. Lewis, careful painter as he is, casts the shadow of a lattice-window in sharply-defined lines upon an opposite wall; which he would not have done, had he been familiar with the phenomena of penumbræ. From want of science, Mr. Rosetti, catching sight of a peculiar iridescence displayed by certain hairy surfaces under particular lights (an iridescence caused by the diffraction of light in passing the hairs), commits the error of showing this iridescence on surfaces and in positions where it could not occur.

To say that music, too, has need of scientific aid will cause still more surprise. Yet it may be shown that music is but an idealization of the natural language of emotion; and that consequently, music must be good or bad according as it conforms to the laws of this natural language. The various inflections

of voice which accompany feelings of different kinds and intensities, are the germs out of which music is developed. It is demonstrable that these inflections and cadences are not accidental or arbitrary; but that they are determined by certain general principles of vital action; and that their expressiveness depends on this. Whence it follows that musical phrases and the melodies built of them, can be effective only when they are in harmony with these general principles. It is difficult here properly to illustrate this position. But perhaps it will suffice to instance the swarms of worthless ballads that infest drawing-rooms, as compositions which science would forbid. They sin against science by setting to music, ideas that are not emotional enough to prompt musical expression; and they also sin against science by using musical phrases that have no natural relations to the ideas expressed: even where these are emotional. They are bad because they are untrue. And to say they are untrue, is to say they are unscientific.

Even in poetry the same thing holds. Like music, poetry has its root in those natural modes of expression which accompany deep feeling. Its rhythm, its strong and numerous metaphors, its hyperboles, its violent inversions, are simply exaggerations of the traits of excited speech. To be good, therefore, poetry must pay attention to those laws of nervous action which excited speech obeys. In intensifying and combining the traits of excited speech, it must have due regard to proportion—must not use its appliances without restriction; but, where the ideas are least emotional, must use the forms of poetical expression sparingly; must use them more freely as the emotion rises; and must carry them to their greatest extent, only where the emotion reaches a climax. The entire contravention of these principles results in bombast or doggerel. The insufficient respect for them is seen in didactic poetry. And it is because they are rarely fully obeyed, that so much poetry is inartistic.

Not only is it that the artist, of whatever kind, cannot

produce a truthful work without he understands the laws of the phenomena he represents; but it is that he must also understand how the minds of spectators or listeners will be affected by the several peculiarities of his work—a question in psychology. What impression any art-product generates, manifestly depends upon the mental natures of those to whom it is presented; and as all mental natures have certain characteristics in common, there must result certain corresponding general principles on which alone art-products can be successfully framed. These general principles cannot be fully understood and applied, unless the artist sees how they follow from the laws of mind. To ask whether the composition of a picture is good, is really to ask how the perceptions and feelings of observers will be affected by it. To ask whether a drama is well constructed, is to ask whether its situations are so arranged as duly to consult the power of attention of an audience, and duly to avoid overtaxing any one class of feelings. Equally in arranging the leading divisions of a poem or fiction, and in combining the words of a single sentence, the goodness of the effect depends upon the skill with which the mental energies and susceptibilities of the reader are economized. Every artist, in the course of his education and after-life, accumulates a stock of maxims by which his practice is regulated. Trace such maxims to their roots, and they inevitably lead you down to psychological principles. And only when the artist understands these psychological principles and their various corollaries, can he work in harmony with them.

We do not for a moment believe that science will make an artist. While we contend that the leading laws both of objective and subjective phenomena must be understood by him, we by no means contend that knowledge of such laws will serve in place of natural perception. Not the poet only, but the artist of every type, is born, not made. What we assert is, that innate faculty cannot dispense with the aid of organized knowledge. Intuition will do much, but it will not do all

Only when Genius is married to Science can the highest results be produced.

As we have above asserted, Science is necessary not only for the most successful production, but also for the full appreciation, of the fine arts. In what consists the greater ability of a man than of a child to perceive the beauties of a picture; unless it is in his more extended knowledge of those truths in nature or life which the picture renders? How happens the cultivated gentleman to enjoy a fine poem so much more than a boor does; if it is not because his wider acquaintance with objects and actions enables him to see in the poem much that the boor cannot see? And if, as is here so obvious, there must be some familiarity with the things represented, before the representation can be appreciated; then, the representation can be completely appreciated, only when the things represented are completely understood. The fact is, that every additional truth which a work of art expresses, gives an additional pleasure to the percipient mind—a pleasure that is missed by those ignorant of this truth. The more realities an artist indicates in any given amount of work, the more faculties does he appeal to; the more numerous ideas does he suggest; the more gratification does he afford. But to receive this gratification the spectator, listener, or reader, must know the realities which the artist has indicated; and to know these realities is to have that much science.

And now let us not overlook the further great fact, that not only does science underlie sculpture, painting, music, poetry, but that science is itself poetic. The current opinion that science and poetry are opposed, is a delusion. It is doubtless true that as states of consciousness, cognition and emotion tend to exclude each other. And it is doubtless also true that an extreme activity of the reflective powers tends to deaden the feelings; while an extreme activity of the feelings tends to deaden the reflective powers: in which sense, indeed, all orders of activity are antagonistic to each other. But it

is not true that the facts of science are unpoetical; or that the cultivation of science is necessarily unfriendly to the exercise of imagination and the love of the beautiful. On the contrary, science opens up realms of poetry where to the unscientific all is a blank. Those engaged in scientific researches constantly show us that they realize not less vividly, but more vividly, than others, the poetry of their subjects. Whoso will dip into Hugh Miller's works on geology, or read Mr. Lewes's "Sea-side Studies," will perceive that science excites poetry rather than extinguishes it. And he who contemplates the life of Goethe, must see that the poet and the man of science can co-exist in equal activity. Is it not, indeed, an absurd and almost a sacrilegious belief, that the more a man studies Nature the less he reveres it? Think you that a drop of water, which to the vulgar eye is but a drop of water, loses anything in the eye of the physicist who knows that its elements are held together by a force which, if suddenly liberated, would produce a flash of lightning? Think you that what is carelessly looked upon by the uninitiated as a mere snow-flake, does not suggest higher associations to one who has seen through a microscope the wondrously-varied and elegant forms of snow-crystals? Think you that the rounded rock marked with parallel scratches, calls up as much poetry in an ignorant mind as in the mind of a geologist, who knows that over this rock a glacier slid a million years ago? The truth is, that those who have never entered upon scientific pursuits are blind to most of the poetry by which they are surrounded. Whoever has not in youth collected plants and insects, knows not half the halo of interest which lanes and hedge-rows can assume. Whoever has not sought for fossils, has little idea of the poetical associations that surround the places where imbedded treasures were found. Whoever at the sea-side has not had a microscope and aquarium, has yet to learn what the highest pleasures of the sea-side are. Sad, indeed, is it to see how men occupy themselves with trivialities, and are indifferent to the grandest

phenomena—care not to understand the architecture of the Heavens, but are deeply interested in some contemptible controversy about the intrigues of Mary Queen of Scots!—are learnedly critical over a Greek ode, and pass by without a glance that grand epic written by the finger of God upon the strata of the Earth!

We find, then, that even for this remaining division of human activities, scientific culture is the proper preparation. We find that æsthetics in general are necessarily based upon scientific principles; and can be pursued with complete success only through an acquaintance with these principles. We find that for the criticism and due appreciation of works of art, a knowledge of the constitution of things, or in other words, a knowledge of science, is requisite. And we not only find that science is the handmaid to all forms of art and poetry, but that, rightly regarded, science is itself poetic.

Thus far our question has been, the worth of knowledge of this or that kind for purposes of guidance. We have now to judge the relative values of different kinds of knowledge for purposes of discipline. This division of our subject we are obliged to treat with comparative brevity; and happily, no very lengthened treatment of it is needed. Having found what is best for the one end, we have by implication found what is best for the other. We may be quite sure that the acquirement of those classes of facts which are most useful for regulating conduct, involves a mental exercise best fitted for strengthening the faculties. It would be utterly contrary to the beautiful economy of Nature, if one kind of culture were needed for the gaining of information and another kind were needed as a mental gymnastic. Everywhere throughout creation we find faculties developed through the performance of those functions which it is their office to perform; not through the performance of artificial exercises devised to fit them for those functions. The Red Indian acquires the

swiftness and agility which make him a successful hunter, by the actual pursuit of animals; and through the miscellaneous activities of his life, he gains a better balance of physical powers than gymnastics ever give. That skill in tracking enemies and prey which he has reached after long practice, implies a subtlety of perception far exceeding anything produced by artificial training. And similarly in all cases. From the Bushman whose eye, habitually employed in identifying distant objects that are to be pursued or fled from, has acquired a telescopic range, to the accountant whose daily practice enables him to add up several columns of figures simultaneously; we find that the highest power of a faculty results from the discharge of those duties which the conditions of life require it to discharge. And we may be certain, *à priori*, that the same law holds throughout education. The education of most value for guidance, must at the same time be the education of most value for discipline. Let us consider the evidence.

One advantage claimed for that devotion to language-learning which forms so prominent a feature in the ordinary *curriculum*, is, that the memory is thereby strengthened. This is assumed to be an advantage peculiar to the study of words. But the truth is, that the sciences afford far wider fields for the exercise of memory. It is no slight task to remember everything about our solar system; much more to remember all that is known concerning the structure of our galaxy. The number of compound substances, to which chemistry daily adds, is so great that few, save professors, can enumerate them; and to recollect the atomic constitutions and affinities of all these compounds, is scarcely possible without making chemistry the occupation of life. In the enormous mass of phenomena presented by the Earth's crust, and in the still more enormous mass of phenomena presented by the fossils it contains, there is matter which it takes the geological student years of application to master. Each leading division of physics—sound, heat, light, electricity—includes facts numer-

ous enough to alarm any one proposing to learn them all. And when we pass to the organic sciences, the effort of memory required becomes still greater. In human anatomy alone, the quantity of detail is so great, that the young surgeon has commonly to get it up half-a-dozen times before he can permanently retain it. The number of species of plants which botanists distinguish, amounts to some 320,000; while the varied forms of animal life with which the zoologist deals, are estimated at some 2,000,000. So vast is the accumulation of facts which men of science have before them, that only by dividing and subdividing their labours can they deal with it. To a detailed knowledge of his own division, each adds but a general knowledge of the allied ones; joined perhaps to a rudimentary acquaintance with some others. Surely, then, science, cultivated even to a very moderate extent, affords adequate exercise for memory. To say the very least, it involves quite as good a discipline for this faculty as language does.

But now mark that while, for the training of mere memory, science is as good as, if not better than, language; it has an immense superiority in the kind of memory it trains. In the acquirement of a language, the connexions of ideas to be established in the mind correspond to facts that are in great measure accidental; whereas, in the acquirement of science, the connexions of ideas to be established in the mind correspond to facts that are mostly necessary. It is true that the relations of words to their meanings are in one sense natural; that the genesis of these relations may be traced back a certain distance, though rarely to the beginning; and that the laws of this genesis form a branch of mental science—the science of philology. But since it will not be contended that in the acquisition of languages, as ordinarily carried on, these natural relations between words and their meanings are habitually traced, and their laws explained; it must be admitted that they are commonly learned as fortuitous relations. On the other hand, the relations which science presents are causal relations; and, when properly taught, are understood as such.

While language familiarizes with non-rational relations, science familiarizes with rational relations. While the one exercises memory only, the other exercises both memory and understanding.

Observe next, that a great superiority of science over language as a means of discipline, is, that it cultivates the judgment. As, in a lecture on mental education delivered at the Royal Institution, Professor Faraday well remarks, the most common intellectual fault is deficiency of judgment. "Society, speaking generally," he says, "is not only ignorant as respects education of the judgment, but it is also ignorant of its ignorance." And the cause to which he ascribes this state, is want of scientific culture. The truth of his conclusion is obvious. Correct judgment with regard to surrounding objects, events, and consequences, becomes possible only through knowledge of the way in which surrounding phenomena depend on each other. No extent of acquaintance with the meanings of words, will guarantee correct inferences respecting causes and effects. The habit of drawing conclusions from data, and then of verifying those conclusions by observation and experiment, can alone give the power of judging correctly. And that it necessitates this habit is one of the immense advantages of science.

Not only, however, for intellectual discipline is science the best; but also for *moral* discipline. The learning of languages tends, if anything, further to increase the already undue respect for authority. Such and such are the meanings of these words, says the teacher or the dictionary. So and so is the rule in this case, says the grammar. By the pupil these dicta are received as unquestionable. His constant attitude of mind is that of submission to dogmatic teaching. And a necessary result is a tendency to accept without inquiry whatever is established. Quite opposite is the mental tone generated by the cultivation of science. Science makes constant appeal to individual reason. Its truths are not accepted on authority alone; but all are at liberty to test them—nay, in many cases, the pupil is

required to think out his own conclusions. Every step in a scientific investigation is submitted to his judgment. He is not asked to admit it without seeing it to be true. And the trust in his own powers thus produced, is further increased by the uniformity with which Nature justifies his inferences when they are correctly drawn. From all which there flows that independence which is a most valuable element in character. Nor is this the only moral benefit bequeathed by scientific culture. When carried on, as it should always be, as much as possible under the form of original research, it exercises perseverance and sincerity. As says Professor Tyndall of inductive inquiry, "it requires patient industry, and an humble and conscientious acceptance of what Nature reveals. The first condition of success is an honest receptivity and a willingness to abandon all preconceived notions, however cherished, if they be found to contradict the truth. Believe me, a self-renunciation which has something noble in it, and of which the world never hears, is often enacted in the private experience of the true votary of science."

Lastly we have to assert—and the assertion will, we doubt not, cause extreme surprise—that the discipline of science is superior to that of our ordinary education, because of the *religious* culture that it gives. Of course we do not here use the words scientific and religious in their ordinary limited acceptations; but in their widest and highest acceptations. Doubtless, to the superstitions that pass under the name of religion, science is antagonistic; but not to the essential religion which these superstitions merely hide. Doubtless, too, in much of the science that is current, there is a pervading spirit of irreligion; but not in that true science which has passed beyond the superficial into the profound.

"True science and true religion," says Professor Huxley at the close of a recent course of lectures, "are twin-sisters, and the separation of either from the other is sure to prove the death of both. Science prospers exactly in proportion as it is religious; and religion flourishes in exact proportion to the scientific depth and

firmness of its basis. The great deeds of philosophers have been less the fruit of their intellect than of the direction of that intellect by an eminently religious tone of mind. Truth has yielded herself rather to their patience, their love, their single-heartedness, and their self-denial, than to their logical acumen."

So far from science being irreligious, as many think, it is the neglect of science that is irreligious—it is the refusal to study the surrounding creation that is irreligious. Take a humble simile. Suppose a writer were daily saluted with praises couched in superlative language. Suppose the wisdom, the grandeur, the beauty of his works, were the constant topics of the eulogies addressed to him. Suppose those who unceasingly uttered these eulogies on his works were content with looking at the outsides of them; and had never opened them, much less tried to understand them. What value should we put upon their praises? What should we think of their sincerity? Yet, comparing small things to great, such is the conduct of mankind in general, in reference to the Universe and its Cause. Nay, it is worse. Not only do they pass by without study, these things which they daily proclaim to be so wonderful; but very frequently they condemn as mere triflers those who give time to the observation of Nature—they actually scorn those who show any active interest in these marvels. We repeat, then, that not science, but the neglect of science, is irreligious. Devotion to science, is a tacit worship—a tacit recognition of worth in the things studied; and by implication in their Cause. It is not a mere lip-homage, but a homage expressed in actions—not a mere professed respect, but a respect proved by the sacrifice of time, thought, and labour.

Nor is it thus only that true science is essentially religious. It is religious, too, inasmuch as it generates a profound respect for, and an implicit faith in, those uniformities of action which all things disclose. By accumulated experiences the man of science acquires a thorough belief in the unchanging relations of phenomena—in the invariable connexion of cause and consequence—in the necessity of good or evil results.

Instead of the rewards and punishments of traditional belief, which people vaguely hope they may gain, or escape, spite of their disobedience; he finds that there are rewards and punishments in the ordained constitution of things; and that the evil results of disobedience are inevitable. He sees that the laws to which we must submit are both inexorable and beneficent. He sees that in conforming to them, the process of things is ever towards a greater perfection and a higher happiness. Hence he is led constantly to insist on them, and is indignant when they are disregarded. And thus does he, by asserting the eternal principles of things and the necessity of obeying them, prove himself intrinsically religious.

Add lastly the further religious aspect of science, that it alone can give us true conceptions of ourselves and our relation to the mysteries of existence. At the same time that it shows us all which can be known, it shows us the limits beyond which we can know nothing. Not by dogmatic assertion, does it teach the impossibility of comprehending the Ultimate Cause of things; but it leads us clearly to recognize this impossibility by bringing us in every direction to boundaries we cannot cross. It realizes to us in a way which nothing else can, the littleness of human intelligence in the face of that which transcends human intelligence. While towards the traditions and authorities of men its attitude may be proud, before the impenetrable veil which hides the Absolute its attitude is humble—a true pride and a true humility. Only the sincere man of science (and by this title we do not mean the mere calculator of distances, or analyzer of compounds, or labeller of species; but him who through lower truths seeks higher, and eventually the highest)—only the genuine man of science, we say, can truly know how utterly beyond, not only human knowledge but human conception, is the Universal Power of which Nature, and Life, and Thought are manifestations.

We conclude, then, that for discipline, as well as for guid-

ance, science is of chiefest value. In all its effects, learning the meanings of things, is better than learning the meanings of words. Whether for intellectual, moral, or religious training, the study of surrounding phenomena is immensely superior to the study of grammars and lexicons.

Thus to the question we set out with—What knowledge is of most worth?—the uniform reply is—Science. This is the verdict on all the counts. For direct self-preservation, or the maintenance of life and health, the all-important knowledge is—Science. For that indirect self-preservation which we call gaining a livelihood, the knowledge of greatest value is—Science. For the due discharge of parental functions, the proper guidance is to be found only in—Science. For that interpretation of national life, past and present, without which the citizen cannot rightly regulate his conduct, the indispensable key is—Science. Alike for the most perfect production and highest enjoyment of art in all its forms, the needful preparation is still—Science. And for purposes of discipline—intellectual, moral, religious—the most efficient study is, once more—Science. The question which at first seemed so perplexed, has become, in the course of our inquiry, comparatively simple. We have not to estimate the degrees of importance of different orders of human activity, and different studies as severally fitting us for them; since we find that the study of Science, in its most comprehensive meaning, is the best preparation for all these orders of activity. We have not to decide between the claims of knowledge of great though conventional value, and knowledge of less though intrinsic value; seeing that the knowledge which proves to be of most value in all other respects, is intrinsically most valuable: its worth is not dependent upon opinion, but is as fixed as is the relation of man to the surrounding world. Necessary and eternal as are its truths, all Science concerns all mankind for all time. Equally at

present and in the remotest future, must it be of incalculable importance for the regulation of their conduct, that men should understand the science of life, physical, mental, and social; and that they should understand all other science as a key to the science of life.

And yet this study, immensely transcending all other in importance, is that which, in an age of boasted education, receives the least attention. While what we call civilization could never have arisen had it not been for science; science forms scarcely an appreciable element in our so-called civilized training. Though to the progress of science we owe it, that millions find support where once there was food only for thousands; yet of these millions but a few thousands pay any respect to that which has made their existence possible. Though increasing knowledge of the properties and relations of things has not only enabled wandering tribes to grow into populous nations, but has given to the countless members of these populous nations, comforts and pleasures which their few naked ancestors never even conceived, or could have believed, yet is this kind of knowledge only now receiving a grudging recognition in our highest educational institutions. To the slowly growing acquaintance with the uniform coexistences and sequences of phenomena—to the establishment of invariable laws, we owe our emancipation from the grossest superstitions. But for science we should be still worshipping fetishes; or, with hecatombs of victims, propitiating diabolical deities. And yet this science, which, in place of the most degrading conceptions of things, has given us some insight into the grandeurs of creation, is written against in our theologies and frowned upon from our pulpits.

Paraphrasing an Eastern fable, we may say that in the family of knowledges, Science is the household drudge, who, in obscurity, hides unrecognized perfections. To her has been committed all the work; by her skill, intelligence, and devotion, have all conveniences and gratifications been obtained; and while ceaselessly ministering to the rest, she

has been kept in the background, that her haughty sisters might flaunt their fripperies in the eyes of the world. The parallel holds yet further. For we are fast coming to the *dénouement,* when the positions will be changed ; and while these haughty sisters sink into merited neglect. Science, proclaimed as highest alike in worth and beauty, will reign supreme.

CHAPTER II.

INTELLECTUAL EDUCATION.

THERE cannot fail to be a relationship between the successive systems of education, and the successive social states with which they have co-existed. Having a common origin in the national mind, the institutions of each epoch, whatever be their special functions, must have a family likeness. When men received their creed and its interpretations from an infallible authority deigning no explanations, it was natural that the teaching of children should be purely dogmatic. While "believe and ask no questions" was the maxim of the Church, it was fitly the maxim of the school. Conversely, now that Protestantism has gained for adults a right of private judgment and established the practice of appealing to reason, there is harmony in the change that has made juvenile instruction a process of exposition addressed to the understanding. Along with political despotism, stern in its commands, ruling by force of terror, visiting trifling crimes with death, and implacable in its vengeance on the disloyal, there necessarily grew up an academic discipline similarly harsh—a discipline of multiplied injunctions and blows for every breach of them—a discipline of unlimited autocracy upheld by rods, and ferules, and the black-hole. On the other hand, the increase of political liberty, the abolition of laws restricting individual action, and the amelioration of the criminal code, have been accompanied by a kindred progress towards non-coercive education: the pupil is hampered by fewer restraints,

and other means than punishments are used to govern him. In those ascetic days when men, acting on the greatest-misery principle, held that the more gratifications they denied themselves the more virtuous they were, they, as a matter of course, considered that the best education which most thwarted the wishes of their children, and cut short all spontaneous activity with—"You must n't do so." While, on the contrary, now that happiness is coming to be regarded as a legitimate aim —now that hours of labour are being shortened and popular recreations provided; parents and teachers are beginning to see that most childish desires may rightly be gratified, that childish sports should be encouraged, and that the tendencies of the growing mind are not altogether so diabolical as was supposed. The age in which all believed that trades must be established by bounties and prohibitions; that manufacturers needed their materials and qualities and prices to be prescribed; and that the value of money could be determined by law; was an age which unavoidably cherished the notions that a child's mind could be made to order; that its powers were to be imparted by the schoolmaster; that it was a receptacle into which knowledge was to be put, and there built up after the teacher's ideal. In this free-trade era, however, when we are learning that there is much more self-regulation in things than was supposed; that labour, and commerce, and agriculture, and navigation, can do better without management than with it; that political governments, to be efficient, must grow up from within and not be imposed from without; we are also being taught that there is a natural process of mental evolution which is not to be disturbed without injury; that we may not force on the unfolding mind our artificial forms; but that psychology, also, discloses to us a law of supply and demand, to which, if we would not do harm, we must conform. Thus, alike in its oracular dogmatism, in its harsh discipline, in its multiplied restrictions, in its professed asceticism, and in its faith in the devices of men, the old educational régime was akin to the social

systems with which it was contemporaneous; and similarly, in the reverse of these characteristics, our modern modes of culture correspond to our more liberal religious and political institutions.

But there remain further parallelisms to which we have not yet adverted: that, namely, between the processes by which these respective changes have been wrought out; and that between the several states of heterogeneous opinion to which they have led. Some centuries ago there was uniformity of belief—religious, political, and educational. All men were Romanists, all were Monarchists, all were disciples of Aristotle; and no one thought of calling in question that grammar-school routine under which all were brought up. The same agency has in each case replaced this uniformity by a constantly-increasing diversity. That tendency towards assertion of the individuality, which, after contributing to produce the great Protestant movement, has since gone on to produce an ever-increasing number of sects—that tendency which initiated political parties, and out of the two primary ones has, in these modern days, evolved a multiplicity to which every year adds—that tendency which led to the Baconian rebellion against the schools, and has since originated here and abroad, sundry new systems of thought—is a tendency which, in education also, has caused divisions and the accumulation of methods. As external consequences of the same internal change, these processes have necessarily been more or less simultaneous. The decline of authority, whether papal, philosophic, kingly, or tutorial, is essentially one phenomenon; in each of its aspects a leaning towards free action is seen alike in the working out of the change itself, and in the new forms of theory and practice to which the change has given birth.

While many will regret this multiplication of schemes of juvenile culture, the catholic observer will discern in it a means of ensuring the final establishment of a rational system. Whatever may be thought of theological dissent, it is clear

that dissent in education results in facilitating inquiry by the division in labour. Were we in possession of the true method, divergence from it would, of course, be prejudicial; but the true method having to be found, the efforts of numerous independent seekers carrying out their researches in different directions, constitute a better agency for finding it than any that could be devised. Each of them struck by some new thought which probably contains more or less of basis in facts —each of them zealous on behalf of his plan, fertile in expedients to test its correctness, and untiring in his efforts to make known its success—each of them merciless in his criticism on the rest; there cannot fail, by composition of forces, to be a gradual approximation of all towards the right course. Whatever portion of the normal method any one has discovered, must, by the constant exhibition of its results, force itself into adoption; whatever wrong practices he has joined with it must, by repeated experiment and failure, be exploded. And by this aggregation of truths and elimination of errors, there must eventually be developed a correct and complete body of doctrine. Of the three phases through which human opinion passes—the unanimity of the ignorant, the disagreement of the inquiring, and the unanimity of the wise — it is manifest that the second is the parent of the third. They are not sequences in time only, they are sequences in causation. However impatiently, therefore, we may witness the present conflict of educational systems, and however much we may regret its accompanying evils, we must recognize it as a transition stage needful to be passed through, and beneficent in its ultimate effects.

Meanwhile, may we not advantageously take stock of our progress? After fifty years of discussion, experiment, and comparison of results, may we not expect a few steps towards the goal to be already made good? Some old methods must by this time have fallen out of use; some new ones must have become established; and many others must be in process of general abandonment or adoption. Probably we may see in

these various changes, when put side by side, similar characteristics—may find in them a common tendency; and so, by inference, may get a clue to the direction in which experience is leading us, and gather hints how we may achieve yet further improvements. Let us then, as a preliminary to a deeper consideration of the matter, glance at the leading contrasts between the education of the past and that of the present.

The suppression of every error is commonly followed by a temporary ascendency of the contrary one; and so it happened, that after the ages when physical development alone was aimed at, there came an age when culture of the mind was the sole solicitude—when children had lesson-books put before them at between two and three years old, and the getting of knowledge was thought the one thing needful. As, further, it usually happens that after one of these reactions the next advance is achieved by co-ordinating the antagonist errors, and perceiving that they are opposite sides of one truth; so, we are now coming to the conviction that body and mind must both be cared for, and the whole being unfolded. The forcing-system has been, by many, given up; and precocity is discouraged. People are beginning to see that the first requisite to success in life, is to be a good animal. The best brain is found of little service, if there be not enough vital energy to work it; and hence to obtain the one by sacrificing the source of the other, is now considered a folly—a folly which the eventual failure of juvenile prodigies constantly illustrates. Thus we are discovering the wisdom of the saying, that one secret in education is "to know how wisely to lose time.'

The once universal practice of learning by rote, is daily falling more into discredit. All modern authorities condemn the old mechanical way of teaching the alphabet. The multiplication table is now frequently taught experimentally. In the acquirement of languages, the grammar-school plan is being superseded by plans based on the spontaneous process

followed by the child in gaining its mother tongue. Describing the methods there used, the "Reports on the Training School at Battersea" say:—"The instruction in the whole preparatory course is chiefly oral, and is illustrated as much as possible by appeals to nature." And so throughout. The rote-system, like other systems of its age, made more of the forms and symbols than of the things symbolized. To repeat the words correctly was everything; to understand their meaning nothing; and thus the spirit was sacrificed to the letter. It is at length perceived that, in this case as in others, such a result is not accidental but necessary—that in proportion as there is attention to the signs, there must be inattention to the things signified; or that, as Montaigne long ago said—*Sçavoir par cœur n'est pas sçavoir.*

Along with rote-teaching, is declining also the nearly-allied teaching by rules. The particulars first, and then the generalization, is the new method—a method, as the Battersea School Reports remark, which, though "the reverse of the method usually followed, which consists in giving the pupil the rule first," is yet proved by experience to be the right one. Rule-teaching is now condemned as imparting a merely empirical knowledge—as producing an appearance of understanding without the reality. To give the net product of inquiry, without the inquiry that leads to it, is found to be both enervating and inefficient. General truths to be of due and permanent use, must be earned. "Easy come easy go," is a saying as applicable to knowledge as to wealth. While rules, lying isolated in the mind—not joined to its other contents as out-growths from them—are continually forgotten; the principles which those rules express piecemeal, become, when once reached by the understanding, enduring possessions. While the rule-taught youth is at sea when beyond his rules, the youth instructed in principles solves a new case as readily as an old one. Between a mind of rules and a mind of principles, there exists a difference such as that between a confused heap of materials, and the same materials organized into a

complete whole, with all its parts bound together. Of which types this last has not only the advantage that its constituent parts are better retained, but the much greater advantage that it forms an efficient agent for inquiry, for independent thought, for discovery—ends for which the first is useless. Nor let it be supposed that this is a simile only: it is the literal truth. The union of facts into generalizations *is* the organization of knowledge, whether considered as an objective phenomenon or a subjective one; and the mental grasp may be measured by the extent to which this organization is carried.

From the substitution of principles for rules, and the necessarily co-ordinate practice of leaving abstractions untaught till the mind has been familiarized with the facts from which they are abstracted, has resulted the postponement of some once early studies to a late period. This is exemplified in the abandonment of that intensely stupid custom, the teaching of grammar to children. As M. Marcel says:—"It may without hesitation be affirmed that grammar is not the stepping-stone, but the finishing instrument." As Mr. Wyse argues:—"Grammar and Syntax are a collection of laws and rules. Rules are gathered from practice; they are the results of induction to which we come by long observation and comparison of facts. It is, in fine, the science, the philosophy of language. In following the process of nature, neither individuals nor nations ever arrive at the science *first*. A language is spoken, and poetry written, many years before either a grammar or prosody is even thought of. Men did not wait till Aristotle had constructed his logic, to reason." In short, as grammar was made after language, so ought it to be taught after language: an inference which all who recognize the relationship between the evolution of the race and that of the individual, will see to be unavoidable.

Of new practices that have grown up during the decline of these old ones, the most important is the systematic

culture of the powers of observation. After long ages of blindness, men are at last seeing that the spontaneous activity of the observing faculties in children, has a meaning and a use. What was once thought mere purposeless action, or play, or mischief, as the case might be, is now recognized as the process of acquiring a knowledge on which all after-knowledge is based. Hence the well-conceived but ill-conducted system of *object-lessons*. The saying of Bacon, that physics is the mother of the sciences, has come to have a meaning in education. Without an accurate acquaintance with the visible and tangible properties of things, our conceptions must be erroneous, our inferences fallacious, and our operations unsuccessful. "The education of the senses neglected, all after education partakes of a drowsiness, a haziness, an insufficiency, which it is impossible to cure." Indeed, if we consider it, we shall find that exhaustive observation is an element in all great success. It is not to artists, naturalists, and men of science only, that it is needful; it is not only that the physician depends on it for the correctness of his diagnosis, and that to the engineer it is so important that some years in the workshop are prescribed for him; but we may see that the philosopher, also, is fundamentally one who *observes* relationships of things which others had overlooked, and that the poet, too, is one who *sees* the fine facts in nature which all recognize when pointed out, but did not before remark. Nothing requires more to be insisted on than that vivid and complete impressions are all-essential. No sound fabric of wisdom can be woven out of a rotten raw-material.

While the old method of presenting truths in the abstract has been falling out of use, there has been a corresponding adoption of the new method of presenting them in the concrete. The rudimentary facts of exact science are now being learnt by direct intuition, as textures, and tastes, and colours are learnt. Employing the ball-frame for first lessons in arithmetic, exemplifies this. It is well illustrated, too, in Professor De Morgan's mode of explaining the decimal

notation. M. Marcel, rightly repudiating the old system of tables, teaches weights and measures by referring to the actual yard and foot, pound and ounce, gallon and quart; and lets the discovery of their relationships be experimental. The use of geographical models and models of the regular bodies, &c., as introductory to geography and geometry respectively, are facts of the same class. Manifestly, a common trait of these methods is, that they carry each child's mind through a process like that which the mind of humanity at large has gone through. The truths of number, of form, of relationship in position, were all originally drawn from objects; and to present these truths to the child in the concrete, is to let him learn them as the race learnt them. By and by, perhaps, it will be seen that he cannot possibly learn them in any other way; for that if he is made to repeat them as abstractions, the abstractions can have no meaning for him, until he finds that they are simply statements of what he intuitively discerns.

But of all the changes taking place, the most significant is the growing desire to make the acquirement of knowledge pleasurable rather than painful—a desire based on the more or less distinct perception, that at each age the intellectual action which a child likes is a healthful one for it; and conversely. There is a spreading opinion that the rise of an appetite for any kind of information, implies that the unfolding mind has become fit to assimilate it, and needs it for purposes of growth; and that, on the other hand, the disgust felt towards such information is a sign either that it is prematurely presented, or that it is presented in an indigestible form. Hence the efforts to make early education amusing, and all education interesting. Hence the lectures on the value of play. Hence the defence of nursery rhymes and fairy tales. Daily we more and more conform our plans to juvenile opinion. Does the child like this or that kind of teaching?—does he take to it? we constantly ask. "His natural desire of variety should be indulged," says M. Mar-

cel; "and the gratification of his curiosity should be combined with his improvement." "Lessons," he again remarks, "should cease before the child evinces symptoms of weariness." And so with later education. Short breaks during school-hours, excursions into the country, amusing lectures, choral songs—in these and many like traits, the change may be discerned. Asceticism is disappearing out of education as out of life; and the usual test of political legislation—its tendency to promote happiness—is beginning to be, in a great degree, the test of legislation for the school and the nursery.

What now is the common characteristic of these several changes? Is it not an increasing conformity to the methods of Nature? The relinquishment of early forcing, against which Nature rebels, and the leaving of the first years for exercise of the limbs and senses, show this. The superseding of rote-learnt lessons by lessons orally and experimentally given, like those of the field and play-ground, shows this. The disuse of rule-teaching, and the adoption of teaching by principles—that is, the leaving of generalizations until there are particulars to base them on—show this. The system of object-lessons shows this. The teaching of the rudiments of science in the concrete instead of the abstract, shows this. And above all, this tendency is shown in the variously-directed efforts to present knowledge in attractive forms, and so to make the acquirement of it pleasurable. For, as it is the order of Nature in all creatures that the gratification accompanying the fulfilment of needful functions serves as a stimulus to their fulfilment—as, during the self-education of the young child, the delight taken in the biting of corals and the pulling to pieces of toys, becomes the prompter to actions which teach it the properties of matter; it follows that, in choosing the succession of subjects and the modes of instruction which most interest the pupil, we are fulfilling Nature's behests, and adjusting our proceedings to the laws of life.

Thus, then, we are on the highway towards the doctrine

long ago enunciated by Pestalozzi, that alike in its order and its methods, education must conform to the natural process of mental evolution—that there is a certain sequence in which the faculties spontaneously develop, and a certain kind of knowledge which each requires during its development; and that it is for us to ascertain this sequence, and supply this knowledge. All the improvements above alluded to are partial applications of this general principle. A nebulous perception of it now prevails among teachers; and it is daily more insisted on in educational works. "The method of nature is the archetype of all methods," says M. Marcel. "The vital principle in the pursuit is to enable the pupil rightly to instruct himself," writes Mr. Wyse. The more science familiarizes us with the constitution of things, the more do we see in them an inherent self-sufficingness. A higher knowledge tends continually to limit our interference with the processes of life. As in medicine the old "heroic treatment" has given place to mild treatment, and often no treatment save a normal regimen—as we have found that it is not needful to mould the bodies of babes by bandaging them in papoose-fashion or otherwise—as in gaols it is being discovered that no cunningly-devised discipline of ours is so efficient in producing reformation as the natural discipline of self-maintenance by productive labour; so in education, we are finding that success is to be achieved only by making our measures subservient to that spontaneous unfolding which all minds go through in their progress to maturity.

Of course, this fundamental principle of tuition, that the arrangement of matter and method must correspond with the order of evolution and mode of activity of the faculties—a principle so obviously true, that once stated it seems almost self-evident—has never been wholly disregarded. Teachers have unavoidably made their school-courses coincide with it in some degree, for the simple reason that education is possible only on that condition. Boys were never taught the rule-of-three until after they had learnt addition. They were not

set to write exercises before they had got into their copy-books. Conic sections have always been preceded by Euclid. But the error of the old methods consists in this, that they do not recognize in detail what they are obliged to recognize in general. Yet the principle applies throughout. If from the time when a child is able to conceive two things as related in position, years must elapse before it can form a true concept of the Earth, as a sphere made up of land and sea, covered with mountains, forests, rivers, and cities, revolving on its axis, and sweeping round the Sun—if it gets from the one concept to the other by degrees—if the intermediate concepts which it forms are consecutively larger and more complicated; is it not manifest that there is a general succession through which alone it can pass; that each larger concept is made by the combination of smaller ones, and presupposes them; and that to present any of these compound concepts before the child is in possession of its constituent ones, is only less absurd than to present the final concept of the series before the initial one? In the mastering of every subject some course of increasingly complex ideas has to be gone through. The evolution of the corresponding faculties consists in the assimilation of these; which, in any true sense, is impossible without they are put into the mind in the normal order. And when this order is not followed, the result is, that they are received with apathy or disgust; and that unless the pupil is intelligent enough eventually to fill up the gaps himself, they lie in his memory as dead facts, capable of being turned to little or no use.

"But why trouble ourselves about any *curriculum* at all?" it may be asked. "If it be true that the mind like the body has a predetermined course of evolution—if it unfolds spontaneously—if its successive desires for this or that kind of information arise when these are severally required for its nutrition—if there thus exists in itself a prompter to the right species of activity at the right time; why interfere in any way? Why not leave children *wholly* to the discipline of

nature ?—why not remain quite passive and let them get knowledge as theybest can ?—why not be consistent throughout ?" This is an awkward-looking question. Plausibly implying as it does, that a system of complete *laissez-faire* is the logical outcome of the doctrines set forth, it seems to furnish a disproof of them by *reductio ad absurdum*. In truth, however, they do not, when rightly understood, commit us to any such untenable position. A glance at the physical analogies will clearly show this. It is a general law of life that the more complex the organism to be produced, the longer the period during which it is dependent on a parent organism for food and protection. The difference between the minute, rapidly-formed, and self-moving spore of a conferva, and the slowly-developed seed of a tree, with its multiplied envelopes and large stock of nutriment laid by to nourish the germ during its first stages of growth, illustrates this law in its application to the vegetal world. Among animals we may trace it in a series of contrasts from the monad whose spontaneously-divided halves are as self-sufficing the moment after their separation as was the original whole ; up to man, whose offspring not only passes through a protracted gestation, and subsequently long depends on the breast for sustenance ; but after that must have its food artificially administered ; must, when it has learned to feed itself, continue to have bread, clothing, and shelter provided ; and does not acquire the power of complete self-support until a time varying from fifteen to twenty years after its birth. Now this law applies to the mind as to the body. For mental pabulum also, every higher creature, and especially man, is at first dependent on adult aid. Lacking the ability to move about, the babe is almost as powerless to get materials on which to exercise its perceptions as it is to get supplies for its stomach. Unable to prepare its own food, it is in like manner unable to reduce many kinds of knowledge to a fit form for assimilation. The language through which all higher truths are to be gained, it wholly derives from those surrounding it. And we see in such an example as the Wild Boy of

Aveyron, the arrest of development that results when no help is received from parents and nurses. Thus, in providing from day to day the right kind of facts, prepared in the right manner, and giving them in due abundance at appropriate intervals, there is as much scope for active ministration to a child's mind as to its body. In either case, it is the chief function of parents to see that the *conditions* requisite to growth are maintained. And as, in supplying aliment, and clothing, and shelter, they may fulfil this function without at all interfering with the spontaneous development of the limbs and viscera, either in their order or mode; so, they may supply sounds for imitation, objects for examination, books for reading, problems for solution, and, if they use neither direct nor indirect coercion, may do this without in any way disturbing the normal process of mental evolution; or rather, may greatly facilitate that process. Hence the admission of the doctrines enunciated does not, as some might argue, involve the abandonment of teaching; but leaves ample room for an active and elaborate course of culture.

Passing from generalities to special considerations, it is to be remarked that in practice, the Pestalozzian system seems scarcely to have fulfilled the promise of its theory. We hear of children not at all interested in its lessons,—disgusted with them rather; and, so far as we can gather, the Pestalozzian schools have not turned out any unusual proportion of distinguished men: if even they have reached the average. We are not surprised at this. The success of every appliance depends mainly upon the intelligence with which it is used. It is a trite remark that, having the choicest tools, an unskilful artizan will botch his work; and bad teachers will fail even with the best methods. Indeed, the goodness of the method becomes in such case a cause of failure; as, to continue the simile, the perfection of the tool becomes in undisciplined hands a source of imperfection in results. A simple, unchanging, almost mechanical routine of tuition, may be carried out

by the commonest intellects, with such small beneficial effect as it is capable of producing; but a complete system—a system as heterogeneous in its appliances as the mind in its faculties—a system proposing a special means for each special end, demands for its right employment powers such as few teachers possess. The mistress of a dame-school can hear spelling-lessons; and any hedge-schoolmaster can drill boys in the multiplication-table. But to teach spelling rightly by using the powers of the letters instead of their names, or to instruct in numerical combinations by experimental synthesis, a modicum of understanding is needful; and to pursue a like rational course throughout the entire range of studies, asks an amount of judgment, of invention, of intellectual sympathy, of analytical faculty, which we shall never see applied to it while the tutorial office is held in such small esteem. True education is practicable only by a true philosopher. Judge, then, what prospect a philosophical method now has of being acted out! Knowing so little as we yet do of psychology, and ignorant as our teachers are of that little, what chance has a system which requires psychology for its basis?

Further hindrance and discouragement has arisen from confounding the Pestalozzian principle with the forms in which it has been embodied. Because particular plans have not answered expectation, discredit has been cast upon the doctrine associated with them: no inquiry being made whether these plans truly conform to the doctrine. Judging as usual by the concrete rather than the abstract, men have blamed the theory for the bunglings of the practice. It is as though the first futile attempt to construct a steam-engine had been held to prove that steam could not be used as a motive power. Let it be constantly borne in mind that while right in his fundamental ideas, Pestalozzi was not therefore right in all his applications of them. As described even by his admirers, Pestalozzi was a man of partial intuitions—a man who had occasional flashes of insight; rather than a man of systematic thought. His first

great success at Stantz was achieved when he had no books or appliances of ordinary teaching, and when "the only object of his attention was to find out at each moment what instruction his children stood peculiarly in need of, and what was the best manner of connecting it with the knowledge they already possessed." Much of his power was due, not to calmly reasoned-out plans of culture, but to his profound sympathy, which gave him a quick perception of childish needs and difficulties. He lacked the ability logically to co-ordinate and develop the truths which he thus from time to time laid hold of; and had in great measure to leave this to his assistants, Kruesi, Tobler, Buss, Niederer, and Schmid. The result is, that in their details his own plans, and those vicariously devised, contain numerous crudities and inconsistencies. His nursery-method, described in "The Mother's Manual," beginning as it does with a nomenclature of the different parts of the body, and proceeding next to specify their relative positions, and next their connexions, may be proved not at all in accordance with the initial stages of mental evolution. His process of teaching the mother-tongue by formal exercises in the meanings of words and in the construction of sentences, is quite needless, and must entail on the pupil loss of time, labour, and happiness. His proposed lessons in geography are utterly unpestalozzian. And often where his plans are essentially sound, they are either incomplete or vitiated by some remnant of the old régime. While, therefore, we would defend in its entire extent the general doctrine which Pestalozzi inaugurated, we think great evil likely to result from an uncritical reception of his specific methods. That tendency, constantly exhibited by mankind, to canonize the forms and practices along with which any great truth has been bequeathed to them—their liability to prostrate their intellects before the prophet, and swear by his every word—their proneness to mistake the clothing of the idea for the idea itself; renders it needful to insist strongly upon the distinction between the fundamental principle of the Pestalozzian system, and the set

of expedients devised for its practice; and to suggest that while the one may be considered as established, the other is probably nothing but an adumbration of the normal course. Indeed, on looking at the state of our knowledge, we may be quite sure that this is the case. Before educational methods can be made to harmonize in character and arrangement with the faculties in their mode and order of unfolding, it is first needful that we ascertain with some completeness how the faculties *do* unfold. At present we have acquired, on this point, only a few general notions. These general notions must be developed in detail—must be transformed into a multitude of specific propositions, before we can be said to possess that *science* on which the *art* of education must be based. And then, when we have definitely made out in what succession and in what combinations the mental powers become active, it remains to choose out of the many possible ways of exercising each of them, that which best conforms to its natural mode of action. Evidently, therefore, it is not to be supposed that even our most advanced modes of teaching are the right ones, or nearly the right ones.

Bearing in mind then this distinction between the principle and the practice of Pestalozzi, and inferring from the grounds assigned that the last must necessarily be very defective, the reader will rate at its true worth the dissatisfaction with the system which some have expressed; and will see that the realization of the Pestalozzian idea remains to be achieved. Should he argue, however, from what has just been said, that no such realization is at present practicable, and that all effort ought to be devoted to the preliminary inquiry; we reply, that though it is not possible for a scheme of culture to be perfected either in matter or form until a rational psychology has been established, it is possible, with the aid of certain guiding principles, to make empirical approximations towards a perfect scheme. To prepare the way for further research we will now specify these principles. Some of them have been more or less distinctly implied in the foregoing

pages; but it will be well here to state them all in logical order.

1. That in education we should proceed from the simple to the complex, is a truth which has always been to some extent acted upon: not professedly, indeed, nor by any means consistently. The mind develops. Like all things that develop it progresses from the homogeneous to the heterogeneous; and a normal training system, being an objective counterpart of this subjective process, must exhibit a like progression. Moreover, thus interpreting it, we may see that this formula has much wider applications than at first appears. For its *rationale* involves, not only that we should proceed from the single to the combined in the teaching of each branch of knowledge; but that we should do the like with knowledge as a whole. As the mind, consisting at first of but few active faculties, has its later-completed faculties successively brought into play, and ultimately comes to have all its faculties in simultaneous action; it follows that our teaching should begin with but few subjects at once, and successively adding to these, should finally carry on all subjects abreast. Not only in its details should education proceed from the simple to the complex, but in its *ensemble* also.

2. The development of the mind, as all other development, is an advance from the indefinite to the definite. In common with the rest of the organism, the brain reaches its finished structure only at maturity; and in proportion as its structure is unfinished, its actions are wanting in precision. Hence like the first movements and the first attempts at speech, the first perceptions and thoughts are extremely vague. As from a rudimentary eye, discerning only the difference between light and darkness, the progress is to an eye that distinguishes kinds and gradations of colour, and details of form, with the greatest exactness; so, the intellect as a whole and in each faculty, beginning with the rudest discriminations among objects and actions, advances towards discriminations of in-

creasing nicety and distinctness. To this general law our educational course and methods must conform. It is not practicable, nor would it be desirable if practicable, to put precise ideas into the undeveloped mind. We may indeed at an early age communicate the verbal forms in which such ideas are wrapped up; and teachers, who habitually do this, suppose that when the verbal forms have been correctly learnt, the ideas which should fill them have been acquired. But a brief cross-examination of the pupil proves the contrary. It turns out either that the words have been committed to memory with little or no thought about their meaning, or else that the perception of their meaning which has been gained is a very cloudy one. Only as the multiplication of experiences gives materials for definite conceptions —only as observation year by year discloses the less conspicuous attributes which distinguish things and processes previously confounded together—only as each class of co-existences and sequences becomes familiar through the recurrence of cases coming under it—only as the various classes of relations get accurately marked off from each other by mutual limitation; can the exact definitions of advanced knowledge become truly comprehensible. Thus in education we must be content to set out with crude notions. These we must aim to make gradually clearer by facilitating the acquisition of experiences such as will correct, first their greatest errors, and afterwards their successively less marked errors. And the scientific formulæ must be given only as fast as the conceptions are perfected.

3. To say that our lessons ought to start from the concrete and end in the abstract, may be considered as in part a repetition of the first of the foregoing principles. Nevertheless it is a maxim that must be stated: if with no other view, then with the view of showing in certain cases what are truly the simple and the complex. For unfortunately there has been much misunderstanding on this point. General formulas which men have devised to express groups of de-

tails, and which have severally simplified their conceptions by uniting many facts into one fact, they have supposed must simplify the conceptions of a child also. They have forgotten that a generalization is simple only in comparison with the whole mass of particular truths it comprehends—that it is more complex than any one of these truths taken singly—that only after many of these single truths have been acquired, does the generalization ease the memory and help the reason—and that to a mind not possessing these single truths it is necessarily a mystery. Thus confounding two kinds of simplification, teachers have constantly erred by setting out with "first principles": a proceeding essentially, though not apparently, at variance with the primary rule; which implies that the mind should be introduced to principles through the medium of examples, and so should be led from the particular to the general—from the concrete to the abstract.

4. The education of the child must accord both in mode and arrangement with the education of mankind, considered historically. In other words, the genesis of knowledge in the individual, must follow the same course as the genesis of knowledge in the race. In strictness, this principle may be considered as already expressed by implication; since both being processes of evolution, must conform to those same general laws of evolution above insisted on, and must therefore agree with each other. Nevertheless this particular parallelism is of value for the specific guidance it affords. To M. Comte we believe society owes the enunciation of it; and we may accept this item of his philosophy without at all committing ourselves to the rest. This doctrine may be upheld by two reasons, quite independent of any abstract theory; and either of them sufficient to establish it. One is deducible from the law of hereditary transmission as considered in its wider consequences. For if it be true that men exhibit likeness to ancestry, both in aspect and character—if it be true that certain mental manifestations, as

insanity, occur in successive members of the same family at the same age—if, passing from individual cases in which the traits of many dead ancestors mixing with those of a few living ones greatly obscure the law, we turn to national types, and remark how the contrasts between them are persistent from age to age—if we remember that these respective types came from a common stock, and that hence the present marked differences between them must have arisen from the action of modifying circumstances upon successive generations who severally transmitted the accumulated effects to their descendants—if we find the differences to be now organic, so that a French child grows into a French man even when brought up among strangers—and if the general fact thus illustrated is true of the whole nature, intellect inclusive; then it follows that if there be an order in which the human race has mastered its various kinds of knowledge, there will arise in every child an aptitude to acquire these kinds of knowledge in the same order. So that even were the order intrinsically indifferent, it would facilitate education to lead the individual mind through the steps traversed by the general mind. But the order is *not* intrinsically indifferent; and hence the fundamental reason why education should be a repetition of civilization in little. It is provable both that the historical sequence was, in its main outlines, a necessary one; and that the causes which determined it apply to the child as to the race. Not to specify these causes in detail, it will suffice here to point out that as the mind of humanity placed in the midst of phenomena and striving to comprehend them, has, after endless comparisons, speculations, experiments, and theories, reached its present knowledge of each subject by a specific route; it may rationally be inferred that the relationship between mind and phenomena is such as to prevent this knowledge from being reached by any other route; and that as each child's mind stands in this same relationship to phenomena, they can be accessible to it only through the same route. Hence in deciding upon

the right method of education, an inquiry into the method of civilization will help to guide us.

5. One of the conclusions to which such an inquiry leads, is, that in each branch of instruction we should proceed from the empirical to the rational. During human progress, every science is evolved out of its corresponding art. It results from the necessity we are under, both individually and as a race, of reaching the abstract by way of the concrete, that there must be practice and an accruing experience with its empirical generalizations, before there can be science. Science is organized knowledge; and before knowledge can be organized, some of it must be possessed. Every study, therefore, should have a purely experimental introduction; and only after an ample fund of observations has been accumulated, should reasoning begin. As illustrative applications of this rule, we may instance the modern course of placing grammar, not before language, but after it; or the ordinary custom of prefacing perspective by practical drawing. By and by further applications of it will be indicated.

6. A second corollary from the foregoing general principle, and one which cannot be too strenuously insisted on, is, that in education the process of self-development should be encouraged to the uttermost. Children should be led to make their own investigations, and to draw their own inferences. They should be *told* as little as possible, and induced to *discover* as much as possible. Humanity has progressed solely by self-instruction; and that to achieve the best results, each mind must progress somewhat after the same fashion, is continually proved by the marked success of self-made men. Those who have been brought up under the ordinary school-drill, and have carried away with them the idea that education is practicable only in that style, will think it hopeless to make children their own teachers. If, however, they will consider that the all-important knowledge of surrounding objects which a child gets in its early years, is got without

help—if they will remember that the child is self-taught in the use of its mother tongue—if they will estimate the amount of that experience of life, that out-of-school wisdom, which every boy gathers for himself—if they will mark the unusual intelligence of the uncared-for London *gamin*, as shown in whatever directions his faculties have been tasked—if further, they will think how many minds have struggled up unaided, not only through the mysteries of our irrationally-planned *curriculum*, but through hosts of other obstacles besides; they will find it a not unreasonable conclusion, that if the subjects be put before him in right order and right form, any pupil of ordinary capacity will surmount his successive difficulties with but little assistance. Who indeed can watch the ceaseless observation, and inquiry, and inference going on in a child's mind, or listen to its acute remarks on matters within the range of its faculties, without perceiving that these powers it manifests, if brought to bear systematically upon studies *within the same range*, would readily master them without help? This need for perpetual telling results from our stupidity, not from the child's. We drag it away from the facts in which it is interested, and which it is actively assimilating of itself. We put before it facts far too complex for it to understand; and therefore distasteful to it. Finding that it will not voluntarily acquire these facts, we thrust them into its mind by force of threats and punishment. By thus denying the knowledge it craves, and cramming it with knowledge it cannot digest, we produce a morbid state of its faculties; and a consequent disgust for knowledge in general. And when, as a result partly of the stolid indolence we have brought on, and partly of still-continued unfitness in its studies, the child can understand nothing without explanation, and becomes a mere passive recipient of our instruction, we infer that education must necessarily be carried on thus. Having by our method induced helplessness, we make the helplessness a reason for our method. Clearly then, the experience of pedagogues cannot rationally be quoted against

the system we are advocating. And whoever sees this, will see that we may safely follow the discipline of Nature throughout—may, by a skilful ministration, make the mind as self-developing in its later stages as it is in its earlier ones; and that only by doing this can we produce the highest power and activity.

7. As a final test by which to judge any plan of culture, should come the question,—Does it create a pleasurable excitement in the pupils? When in doubt whether a particular mode or arrangement is or is not more in harmony with the foregoing principles than some other, we may safely abide by this criterion. Even when, as considered theoretically, the proposed course seems the best, yet if it produces no interest, or less interest than some other course, we should relinquish it; for a child's intellectual instincts are more trustworthy than our reasonings. In respect to the knowing-faculties, we may confidently trust in the general law, that under normal conditions, healthful action is pleasurable, while action which gives pain is not healthful. Though at present very incompletely conformed to by the emotional nature, yet by the intellectual nature, or at least by those parts of it which the child exhibits, this law is almost wholly conformed to. The repugnances to this and that study which vex the ordinary teacher, are not innate, but result from his unwise system. Fellenberg says, "Experience has taught me that *indolence* in young persons is so directly opposite to their natural disposition to activity, that unless it is the consequence of bad education, it is almost invariably connected with some constitutional defect." And the spontaneous activity to which children are thus prone, is simply the pursuit of those pleasures which the healthful exercise of the faculties gives. It is true that some of the higher mental powers, as yet but little developed in the race, and congenitally possessed in any considerable degree only by the most advanced, are indisposed to the amount of exertion required of them. But these, in virtue of their very complexity, will, in a normal course of

culture, come last into exercise; and will therefore have no demands made on them until the pupil has arrived at an age when ulterior motives can be brought into play, and an indirect pleasure made to counterbalance a direct displeasure. With all faculties lower than these, however, the immediate gratification consequent on activity, is the normal stimulus; and under good management the only needful stimulus. When we have to fall back on some other, we must take the fact as evidence that we are on the wrong track. Experience is daily showing with greater clearness, that there is always a method to be found productive of interest—even of delight; and it ever turns out that this is the method proved by all other tests to be the right one.

With most, these guiding principles will weigh but little if left in this abstract form. Partly, therefore, to exemplify their application, and partly with a view of making sundry specific suggestions, we propose now to pass from the theory of education to the practice of it.

It was the opinion of Pestalozzi, and one which has ever since his day been gaining ground, that education of some kind should begin from the cradle. Whoever has watched with any discernment, the wide-eyed gaze of the infant at surrounding objects, knows very well that education *does* begin thus early, whether we intend it or not; and that these fingerings and suckings of everything it can lay hold of, these open-mouthed listenings to every sound, are first steps in the series which ends in the discovery of unseen planets, the invention of calculating engines, the production of great paintings, or the composition of symphonies and operas. This activity of the faculties from the very first, being spontaneous and inevitable, the question is whether we shall supply in due variety the materials on which they may exercise themselves; and to the question so put, none but an affirmative answer can be given. As before said, however, agreement with Pestalozzi's theory does not involve agree-

ment with his practice; and here occurs a case in point. Treating of instruction in spelling he says:—

"The spelling-book ought, therefore, to contain all the sounds of the language, and these ought to be taught in every family from the earliest infancy. The child who learns his spelling-book ought to repeat them to the infant in the cradle, before it is able to pronounce even one of them, so that they may be deeply impressed upon its mind by frequent repetition."

Joining this with the suggestions for "a nursery method," set down in his "Mother's Manual," in which he makes the names, positions, connexions, numbers, properties, and uses of the limbs and body his first lessons, it becomes clear that Pestalozzi's notions on early mental development were too crude to enable him to devise judicious plans. Let us consider the course which Psychology dictates.

The earliest impressions which the mind can assimilate, are the undecomposable sensations produced by resistance, light, sound, &c. Manifestly, decomposable states of consciousness cannot exist before the states of consciousness out of which they are composed. There can be no idea of form until some familiarity with light in its gradations and qualities, or resistance in its different intensities, has been acquired; for, as has been long known, we recognize visible form by means of varieties of light, and tangible form by means of varieties of resistance. Similarly, no articulate sound is cognizable until the inarticulate sounds which go to make it up have been learned. And thus must it be in every other case. Following, therefore, the necessary law of progression from the simple to the complex, we should provide for the infant a sufficiency of objects presenting different degrees and kinds of resistance, a sufficiency of objects reflecting different amounts and qualities of light, and a sufficiency of sounds contrasted in their loudness, their pitch and their *timbre*. How fully this *à priori* conclusion is confirmed by infantile instincts, all will see on being reminded of the delight which every young child has in biting its toys, in feeling its brother's bright jacket-buttons, and pulling papa's whiskers—how absorbed

it becomes in gazing at any gaudily-painted object, to which it applies the word "pretty," when it can pronounce it, wholly because of the bright colours—and how its face broadens into a laugh at the tattlings of its nurse, the snapping of a visitor's fingers, or any sound which it has not before heard. Fortunately, the ordinary practices of the nursery fulfil these early requirements of education to a considerable degree. Much, however, remains to be done; and it is of more importance that it should be done than at first appears. Every faculty during that spontaneous activity which accompanies its evolution, is capable of receiving more vivid impressions than at any other period. Moreover, as these simplest elements have to be mastered, and as the mastery of them whenever achieved must take time, it becomes an economy of time to occupy this first stage of childhood, during which no other intellectual action is possible, in gaining a complete familiarity with them in all their modifications. Nor let us omit the fact, that both temper and health will be improved by the continual gratification resulting from a due supply of these impressions which every child so greedily assimilates. Space, could it be spared, might here be well filled by some suggestions towards a more systematic ministration to these simplest of the perceptions. But it must suffice to point out that any such ministration, recognizing the general law of evolution from the indefinite to the definite, should proceed upon the corollary that in the development of every faculty, markedly contrasted impressions are the first to be distinguished; that hence sounds greatly differing in loudness and pitch, colours very remote from each other, and substances widely unlike in hardness or texture, should be the first supplied; and that in each case the progression must be by slow degrees to impressions more nearly allied.

Passing on to object-lessons, which manifestly form a natural continuation of this primary culture of the senses, it is to be remarked, that the system commonly pursued is

wholly at variance with the method of Nature, as exhibited alike in infancy, in adult life, and in the course of civilization. "The child," says M. Marcel, "must be *shown* how all the parts of an object are connected, &c.;" and the various manuals of these object-lessons severally contain lists of the facts which the child is to be *told* respecting each of the things put before it. Now it needs but a glance at the daily life of the infant to see that all the knowledge of things which is gained before the acquirement of speech, is self-gained—that the qualities of hardness and weight associated with certain appearances, the possession of particular forms and colours by particular persons, the production of special sounds by animals of special aspects, are phenomena which it observes for itself. In manhood too, when there are no longer teachers at hand, the observations and inferences hourly required for guidance, must be made unhelped; and success in life depends upon the accuracy and completeness with which they are made. Is it probable then, that while the process displayed in the evolution of humanity at large, is repeated alike by the infant and the man, a reverse process must be followed during the period between infancy and manhood? and that too, even in so simple a thing as learning the properties of objects? Is it not obvious, on the contrary, that one method must be pursued throughout? And is not Nature perpetually thrusting this method upon us, if we had but the wit to see it, and the humility to adopt it? What can be more manifest than the desire of children for intellectual sympathy? Mark how the infant sitting on your knee thrusts into your face the toy it holds, that you too may look at it. See when it makes a creak with its wet finger on the table, how it turns and looks at you; does it again, and again looks at you; thus saying as clearly as it can—"Hear this new sound." Watch the elder children coming into the room exclaiming—"Mamma, see what a curious thing," "Mamma, look at this," "Mamma, look at that:" a habit which they would continue, did not the silly mamma tell them not to tease her. Observe

that, when out with the nurse-maid, each little one runs up to her with the new flower it has gathered, to show her how pretty it is, and to get her also, to say it is pretty. Listen to the eager volubility with which every urchin describes any novelty he has been to see; if only he can find some one who will attend with any interest. Does not the induction lie on the surface? Is it not clear that we must conform our course to these intellectual instincts—that we must just systematize the natural process—that we must listen to all the child has to tell us about each object; must induce it to say everything it can think of about such object; must occasionally draw its attention to facts it has not yet observed, with the view of leading it to notice them itself whenever they recur; and must go on by and by to indicate or supply new series of things for a like exhaustive examination? Note the way in which, on this method, the intelligent mother conducts her lessons. Step by step she familiarizes her little boy with the names of the simpler attributes, hardness, softness, colour, taste, size: in doing which she finds him eagerly help by bringing this to show her that it is red, and the other to make her feel that it is hard, as fast as she gives him words for these properties. Each additional property, as she draws his attention to it in some fresh thing which he brings her, she takes care to mention in connexion with those he already knows; so that by the natural tendency to imitate, he may get into the habit of repeating them one after another. Gradually as there occur cases in which he omits to name one or more of the properties he has become acquainted with, she introduces the practice of asking him whether there is not something more that he can tell her about the thing he has got. Probably he does not understand. After letting him puzzle awhile she tells him; perhaps laughing at him a little for his failure. A few recurrences of this and he perceives what is to be done. When next she says she knows something more about the object than he has told her, his pride is roused; he looks at it intently; he thinks over all that he has heard: and the problem being easy,

presently finds it out. He is full of glee at his success, and she sympathizes with him. In common with every child, he delights in the discovery of his powers. He wishes for more victories, and goes in quest of more things about which to tell her. As his faculties unfold she adds quality after quality to his list: progressing from hardness and softness to roughness and smoothness, from colour to polish, from simple bodies to composite ones—thus constantly complicating the problem as he gains competence, constantly taxing his attention and memory to a greater extent, constantly maintaining his interest by supplying him with new impressions such as his mind can assimilate, and constantly gratifying him by conquests over such small difficulties as he can master. In doing this she is manifestly but following out that spontaneous process which was going on during a still earlier period—simply aiding self-evolution; and is aiding it in the mode suggested by the boy's instinctive behaviour to her. Manifestly, too, the course she is adopting is the one best calculated to establish a habit of exhaustive observation; which is the professed aim of these lessons. To *tell* a child this and to *show* it the other, is not to teach it how to observe, but to make it a mere recipient of another's observations: a proceeding which weakens rather than strengthens its powers of self-instruction—which deprives it of the pleasures resulting from successful activity—which presents this all-attractive knowledge under the aspect of formal tuition—and which thus generates that indifference and even disgust not unfrequently felt towards these object-lessons. On the other hand, to pursue the course above described is simply to guide the intellect to its appropriate food; to join with the intellectual appetites their natural adjuncts—*amour propre* and the desire for sympathy; to induce by the union of all these an intensity of attention which insures perceptions both vivid and complete; and to habituate the mind from the beginning to that practice of self-help which it must ultimately follow.

Object-lessons should not only be carried on after quite a

different fashion from that commonly pursued, but should be extended to a range of things far wider, and continued to a period far later, than now. They should not be limited to the contents of the house; but should include those of the fields and the hedges, the quarry and the sea-shore. They should not cease with early childhood; but should be so kept up during youth, as insensibly to merge into the investigations of the naturalist and the man of science. Here again we have but to follow Nature's leadings. Where can be seen an intenser delight than that of children picking up new flowers and watching new insects; or hoarding pebbles and shells? And who is there but perceives that by sympathizing with them they may be led on to any extent of inquiry into the qualities and structures of these things? Every botanist who has had children with him in the woods and lanes must have noticed how eagerly they joined in his pursuits, how keenly they searched out plants for him, how intently they watched while he examined them, how they overwhelmed him with questions. The consistent follower of Bacon—the "servant and interpreter of nature," will see that we ought modestly to adopt the course of culture thus indicated. Having become familiar with the simpler properties of inorganic objects, the child should by the same process be led on to an exhaustive examination of the things it picks up in its daily walks—the less complex facts they present being alone noticed at first: in plants, the colours, numbers, and forms of the petals, and shapes of the stalks and leaves; in insects, the numbers of the wings, legs, and antennæ, and their colours. As these become fully appreciated and invariably observed, further facts may be successively introduced: in the one case, the numbers of stamens and pistils, the forms of the flowers, whether radial or bilateral in symmetry, the arrangement and character of the leaves, whether opposite or alternate, stalked or sessile, smooth or hairy, serrated, toothed, or crenate; in the other, the divisions of the body, the segments of the abdomen, the markings of the wings, the number of joints in the legs, and the forms

of the smaller organs—the system pursued throughout, being that of making it the child's ambition to say respecting everything it finds, all that can be said. Then when a fit age has been reached, the means of preserving these plants, which have become so interesting in virtue of the knowledge obtained of them, may as a great favour be supplied; and eventually, as a still greater favour, may also be supplied the apparatus needful for keeping the larvæ of our common butterflies and moths through their transformations—a practice which, as we can personally testify, yields the highest gratification; is continued with ardour for years; when joined with the formation of an entomological collection, adds immense interest to Saturday-afternoon rambles; and forms an admirable introduction to the study of physiology.

We are quite prepared to hear from many that all this is throwing away time and energy; and that children would be much better occupied in writing their copies or learning their pence-tables, and so fitting themselves for the business of life. We regret that such crude ideas of what constitutes education, and such a narrow conception of utility, should still be prevalent. Saying nothing on the need for a systematic culture of the perceptions and the value of the practices above inculcated as subserving that need, we are prepared to defend them even on the score of the knowledge gained. If men are to be mere cits, mere porers over ledgers, with no ideas beyond their trades—if it is well that they should be as the cockney whose conception of rural pleasures extends no further than sitting in a tea-garden smoking pipes and drinking porter; or as the squire who thinks of woods as places for shooting in, of uncultivated plants as nothing but weeds, and who classifies animals into game, vermin, and stock—then indeed it is needless to learn any thing that does not directly help to replenish the till and fill the larder. But if there is a more worthy aim for us than to be drudges—if there are other uses in the things around than their power to bring money—if there are higher faculties

to be exercised than acquisitive and sensual ones—if the pleasures which poetry and art and science and philosophy can bring are of any moment; then is it desirable that the instinctive inclination which every child shows to observe natural beauties and investigate natural phenomena, should be encouraged. But this gross utilitarianism which is content to come into the world and quit it again without knowing what kind of a world it is or what it contains, may be met on its own ground. It will by and by be found that a knowledge of the laws of life is more important than any other knowledge whatever—that the laws of life underlie not only all bodily and mental processes, but by implication all the transactions of the house and the street, all commerce, all politics, all morals—and that therefore without a comprehension of them, neither personal nor social conduct can be rightly regulated. It will eventually be seen too, that the laws of life are essentially the same throughout the whole organic creation; and further, that they cannot be properly understood in their complex manifestations until they have been studied in their simpler ones. And when this is seen, it will be also seen that in aiding the child to acquire the out-of-door information for which it shows so great an avidity, and in encouraging the acquisition of such information throughout youth, we are simply inducing it to store up the raw material for future organization—the facts that will one day bring home to it with due force, those great generalizations of science by which actions may be rightly guided.

The spreading recognition of drawing as an element of education, is one among many signs of the more rational views on mental culture now beginning to prevail. Once more it may be remarked that teachers are at length adopting the course which Nature has perpetually been pressing on their notice. The spontaneous attempts made by children to represent the men, houses, trees, and animals around them—on a slate if they can get nothing better, or with lead-pencil on paper if they can beg them—are familiar to all. To be

shown through a picture-book is one of their highest gratifications; and as usual, their strong imitative tendency presently generates in them the ambition to make pictures themselves also. This effort to depict the striking things they see, is a further instinctive exercise of the perceptions — a means whereby still greater accuracy and completeness of observation are induced. And alike by trying to interest us in their discoveries of the sensible properties of things, and by their endeavours to draw, they solicit from us just that kind of culture which they most need.

Had teachers been guided by Nature's hints, not only in making drawing a part of education but in choosing modes of teaching it, they would have done still better than they have done. What is that the child first tries to represent? Things that are large, things that are attractive in colour, things round which its pleasurable associations most cluster—human beings from whom it has received so many emotions; cows and dogs which interest by the many phenomena they present; houses that are hourly visible and strike by their size and contrast of parts. And which of the processes of representation gives it most delight? Colouring. Paper and pencil are good in default of something better; but a box of paints and a brush—these are the treasures. The drawing of outlines immediately becomes secondary to colouring—is gone through mainly with a view to the colouring; and if leave can be got to colour a book of prints, how great is the favour! Now, ridiculous as such a position will seem to drawing-masters, who postpone colouring and who teach form by a dreary discipline of copying lines, we believe that the course of culture thus indicated is the right one. The priority of colour to form, which, as already pointed out, has a psychological basis, should be recognized from the beginning; and from the beginning also, the things imitated should be real. That greater delight in colour which is not only conspicuous in children but persists in most persons throughout life, should be continuously employed as the natural stimulus to the

mastery of the comparatively difficult and unattractive form: the pleasure of the subsequent tinting, should be the prospective reward for the labour of delineation. And these efforts to represent interesting actualities, should be encouraged; in the conviction that as, by a widening experience, simpler and more practicable objects become interesting, they too will be attempted; and that so a gradual approximation will be made towards imitations having some resemblance to the realities. The extreme indefiniteness which, in conformity with the law of evolution, these first attempts exhibit, is anything but a reason for ignoring them. No matter how grotesque the shapes produced; no matter how daubed and glaring the colours. The question is not whether the child is producing good drawings. The question is, whether it is developing its faculties. It has first to gain some command over its fingers, some crude notions of likeness; and this practice is better than any other for these ends, since it is the spontaneous and interesting one. During early childhood no formal drawing-lessons are possible. Shall we therefore repress, or neglect to aid, these efforts at self-culture? or shall we encourage and guide them as normal exercises of the perceptions and the powers of manipulation? If by furnishing cheap woodcuts to be painted, and simple contour-maps to have their boundary lines tinted, we can not only pleasurably draw out the faculty of colour, but can incidentally produce some familiarity with the outlines of things and countries, and some ability to move the brush steadily; and if by the supply of tempting objects we can keep up the instinctive practice of making representations, however rough; it must happen that when the age for lessons in drawing is reached, there will exist a facility that would else have been absent. Time will have been gained; and trouble both to teacher and pupil, saved.

From what has been said, it may be readily inferred that we condemn the practice of drawing from copies; and still more so that formal discipline in making straight lines and

curved lines and compound lines, with which it is the fashion of some teachers to begin. We regret that the Society of Arts has recently, in its series of manuals on "Rudimentary Art-Instruction," given its countenance to an elementary drawing-book, which is the most vicious in principle that we have seen. We refer to the "Outline from Outline, or from the Flat," by John Bell, sculptor. As explained in the prefatory note, this publication proposes "to place before the student a simple, yet logical mode of instruction;" and to this end sets out with a number of definitions thus:—

"A simple line in drawing is a thin mark drawn from one point to another.

"Lines may be divided, as to their nature in drawing, into two classes:—

"1. *Straight*, which are marks that go the shortest road between two points, as A B.

"2. Or *Curved*, which are marks which do not go the shortest road between two points, as C D."

And so the introduction progresses to horizontal lines, perpendicular lines, oblique lines, angles of the several kinds, and the various figures which lines and angles make up. The work is, in short, a grammar of form, with exercises. And thus the system of commencing with a dry analysis of elements, which, in the teaching of language, has been exploded, is to be re-instituted in the teaching of drawing. We are to set out with the definite, instead of with the indefinite. The abstract is to be preliminary to the concrete. Scientific conceptions are to precede empirical experiences. That this is an inversion of the normal order, we need scarcely repeat. It has been well said concerning the custom of prefacing the art of speaking any tongue by a drilling in the parts of speech and their functions, that it is about as reasonable as prefacing the art of walking by a course of lessons on the bones, muscles, and nerves of the legs; and much the same thing may be said of the proposal to preface the art of representing objects, by a nomenclature and defi-

nitions of the lines which they yield on analysis. These technicalities are alike repulsive and needless. They render the study distasteful at the very outset; and all with the view of teaching that which, in the course of practice, will be learnt unconsciously. Just as the child incidentally gathers the meanings of ordinary words from the conversations going on around it, without the help of dictionaries; so, from the remarks on objects, pictures, and its own drawings, will it presently acquire, not only without effort but even pleasurably, those same scientific terms which, when taught at first, are a mystery and a weariness.

If any dependence is to be placed on the general principles of education that have been laid down, the process of learning to draw should be throughout continuous with those efforts of early childhood, described above as so worthy of encouragement. By the time that the voluntary practice thus initiated has given some steadiness of hand, and some tolerable ideas of proportion, there will have arisen a vague notion of body as presenting its three dimensions in perspective. And when, after sundry abortive, Chinese-like attempts to render this appearance on paper, there has grown up a pretty clear perception of the thing to be done, and a desire to do it, a first lesson in empirical perspective may be given by means of the apparatus occasionally used in explaining perspective as a science. This sounds alarming; but the experiment is both comprehensible and interesting to any boy or girl of ordinary intelligence. A plate of glass so framed as to stand vertically on the table, being placed before the pupil, and a book or like simple object laid on the other side of it, he is requested, while keeping the eye in one position, to make ink-dots on the glass, so that they may coincide with, or hide, the corners of this object. He is next told to join these dots by lines; on doing which he perceives that the lines he makes hide, or coincide with, the outlines of the object. And then by putting a sheet of paper on the other side of the glass, it is made manifest to him that the lines he has thus drawn repre-

sent the object as he saw it. They not only look like it, but he perceives that they must be like it, because he made them agree with its outlines; and by removing the paper he can convince himself that they do agree with its outlines. The fact is new and striking; and serves him as an experimental demonstration, that lines of certain lengths, placed in certain directions on a plane, can represent lines of other lengths, and having other directions, in space. By gradually changing the position of the object, he may be led to observe how some lines shorten and disappear, while others come into sight and lengthen. The convergence of parallel lines, and, indeed, all the leading facts of perspective, may, from time to time, be similarly illustrated to him. If he has been duly accustomed to self-help, he will gladly, when it is suggested, attempt to draw one of these outlines on paper, by the eye only; and it may soon be made an exciting aim to produce, unassisted, a representation as like as he can to one subsequently sketched on the glass. Thus, without the unintelligent, mechanical practice of copying other drawings, but by a method at once simple and attractive—rational, yet not abstract,—a familiarity with the linear appearances of things, and a faculty of rendering them, may be step by step acquired. To which advantages add these:—that even thus early the pupil learns, almost unconsciously, the true theory of a picture (namely, that it is a delineation of objects as they appear when projected on a plane placed between them and the eye); and that when he reaches a fit age for commencing scientific perspective, he is already thoroughly acquainted with the facts which form its logical basis.

As exhibiting a rational mode of conveying primary conceptions in geometry, we cannot do better than quote the following passage from Mr. Wyse:—

"A child has been in the habit of using cubes for arithmetic; let him use them also for the elements of geometry. I would begin with solids, the reverse of the usual plan. It saves all the difficulty of absurd definitions, and bad explanations on points, lines, and surfaces, which are nothing but abstractions . . A cube

presents many of the principal elements of geometry; it at once exhibits points, straight lines, parallel lines, angles, parallelograms, &c., &c. These cubes are divisible into various parts. The pupil has already been familiarized with such divisions in numeration, and he now proceeds to a comparison of their several parts, and of the relation of these parts to each other. . . . From thence he advances to globes, which furnish him with elementary notions of the circle, of curves generally, &c., &c.

"Being tolerably familiar with solids, he may now substitute planes. The transition may be made very easy. Let the cube, for instance, be cut into thin divisions, and placed on paper; he will then see as many plane rectangles as he has divisions; so with all the others. Globes may be treated in the same manner; he will thus see how surfaces really are generated, and be enabled to abstract them with facility in every solid.

"He has thus acquired the alphabet and reading of geometry. He now proceeds to write it.

"The simplest operation, and therefore the first, is merely to place these planes on a piece of paper, and pass the pencil round them. When this has been frequently done, the plane may be put at a little distance, and the child required to copy it, and so on."

A stock of geometrical conceptions having been obtained, in some such manner as this recommended by Mr. Wyse, a further step may be taken, by introducing the practice of testing the correctness of figures drawn by eye: thus both exciting an ambition to make them exact, and continually illustrating the difficulty of fulfilling that ambition. There can be little doubt that geometry had its origin (as, indeed, the word implies) in the methods discovered by artizans and others, of making accurate measurements for the foundations of buildings, areas of inclosures, and the like; and that its truths came to be treasured up, merely with a view to their immediate utility. They should be introduced to the pupil under analogous relationships. In cutting out pieces for his card-houses, in drawing ornamental diagrams for colouring, and in those various instructive occupations which an inventive teacher will lead him into, he may for a length of time be advantageously left, like the primitive builder, to tentative processes; and so will learn through experience the difficulty of achieving his aims by the unaided senses. When, having meanwhile undergone a valuable discipline of the perceptions,

he has reached a fit age for using a pair of compasses, he will, while duly appreciating these as enabling him to verify his ocular guesses, be still hindered by the imperfections of the approximative method. In this stage he may be left for a further period: partly as being yet too young for anything higher; partly because it is desirable that he should be made to feel still more strongly the want of systematic contrivances. If the acquisition of knowledge is to be made continuously interesting; and if, in the early civilization of the child, as in the early civilization of the race, science is valued only as ministering to art; it is manifest that the proper preliminary to geometry, is a long practice in those constructive processes which geometry will facilitate. Observe that here, too, Nature points the way. Children show a strong propensity to cut out things in paper, to make, to build—a propensity which, if encouraged and directed, will not only prepare the way for scientific conceptions, but will develop those powers of manipulation in which most people are so deficient.

When the observing and inventive faculties have attained the requisite power, the pupil may be introduced to empirical geometry; that is—geometry dealing with methodical solutions, but not with the demonstrations of them. Like all other transitions in education, this should be made not formally but incidentally; and the relationship to constructive art should still be maintained. To make, out of cardboard, a tetrahedron like one given to him, is a problem which will interest the pupil, and serve as a convenient starting-point. In attempting this, he finds it needful to draw four equilateral triangles arranged in special positions. Being unable in the absence of an exact method to do this accurately, he discovers on putting the triangles into their respective positions, that he cannot make their sides fit; and that their angles do not meet at the apex. He may now be shown how, by describing a couple of circles, each of these triangles may be drawn with perfect correctness and without guessing; and after his failure he

will value the information. Having thus helped him to the solution of his first problem, with the view of illustrating the nature of geometrical methods, he is in future to be left to solve the questions put to him as best he can. To bisect a line, to erect a perpendicular, to describe a square, to bisect an angle, to draw a line parallel to a given line, to describe a hexagon, are problems which a little patience will enable him to find out. And from these he may be led on step by step to more complex questions: all of which, under judicious management, he will puzzle through unhelped. Doubtless, many of those brought up under the old regime, will look upon this assertion sceptically. We speak from facts, however; and those neither few nor special. We have seen a class of boys become so interested in making out solutions to such problems, as to look forward to their geometry-lesson as a chief event of the week. Within the last month, we have heard of one girls' school, in which some of the young ladies voluntarily occupy themselves with geometrical questions out of school-hours; and of another, where they not only do this, but where one of them is begging for problems to find out during the holidays: both which facts we state on the authority of the teacher. Strong proofs, these, of the practicability and the immense advantage of self-development! A branch of knowledge which, as commonly taught, is dry and even repulsive, is thus, by following the method of Nature, made extremely interesting and profoundly beneficial. We say profoundly beneficial, because the effects are not confined to the gaining of geometrical facts, but often revolutionize the whole state of mind. It has repeatedly occurred that those who have been stupified by the ordinary school-drill—by its abstract formulas, its wearisome tasks, its cramming—have suddenly had their intellects roused by thus ceasing to make them passive recipients, and inducing them to become active discoverers. The discouragement caused by bad teaching having been diminished by a little sympathy, and sufficient perseverance excited to achieve a first success, there

arises a revulsion of feeling affecting the whole nature. They no longer find themselves incompetent; they, too, can do something. And gradually as success follows success, the incubus of despair disappears, and they attack the difficulties of their other studies with a courage insuring conquest.

A few weeks after the foregoing remarks were originally published, Professor Tyndall in a lecture at the Royal Institution "On the Importance of the Study of Physics as a Branch of Education," gave some conclusive evidence to the same effect. His testimony, based on personal observation, is of such great value that we cannot refrain from quoting it. Here it is.

"One of the duties which fell to my share, during the period to which I have referred, was the instruction of a class in mathematics, and I usually found that Euclid and the ancient geometry generally, when addressed to the understanding, formed a very attractive study for youth. But it was my habitual practice to withdraw the boys from the routine of the book, and to appeal to their self-power in the treatment of questions not comprehended in that routine. At first, the change from the beaten track usually excited a little aversion: the youth felt like a child amid strangers; but in no single instance have I found this aversion to continue. When utterly disheartened, I have encouraged the boy by that anecdote of Newton, where he attributes the difference between him and other men, mainly to his own patience; or of Mirabeau, when he ordered his servant, who had stated something to be impossible, never to use that stupid word again. Thus cheered, he has returned to his task with a smile, which perhaps had something of doubt in it, but which, nevertheless, evinced a resolution to try again. I have seen the boy's eye brighten, and at length, with a pleasure of which the ecstasy of Archimedes was but a simple expansion, heard him exclaim, 'I have it, sir.' The consciousness of self-power, thus awakened, was of immense value; and animated by it, the progress of the class was truly astonishing. It was often my custom to give the boys their choice of pursuing their propositions in the book, or of trying their strength at others not to be found there. Never in a single instance have I known the book to be chosen. I was ever ready to assist when I deemed help needful, but my offers of assistance were habitually declined. The boys had tasted the sweets of intellectual conquest and demanded victories of their own. I have seen their diagrams scratched on the walls, cut into the beams upon the play-ground, and numberless other illustrations of the living interest they took in the subject. For my own part, as far as experience in teaching goes, I was a mere fledgling: I knew nothing of the rules of pedagogics, as the Germans name it; but I adhered to the spirit indicated at the commencement of this discourse, and endeavoured to make geometry a *means* and not a *branch* of educa-

tion. The experiment was successful, and some of the most delightful hours of my existence have been spent in marking the vigorous and cheerful expansion of mental power, when appealed to in the manner I have described."

This empirical geometry which presents an endless series of problems, should be continued along with other studies for years; and may throughout be advantageously accompanied by those concrete applications of its principles which serve as its preliminary. After the cube, the octahedron, and the various forms of pyramid and prism have been mastered, may come the more complex regular bodies — the dodecahedron and icosahedron—to construct which out of single pieces of cardboard, requires considerable ingenuity. From these, the transition may naturally be made to such modified forms of the regular bodies as are met with in crystals—the truncated cube, the cube with its dihedral as well as its solid angles truncated, the octahedron and the various prisms as similarly modified: in imitating which numerous forms assumed by different metals and salts, an acquaintance with the leading facts of mineralogy will be incidentally gained.*

After long continuance in exercises of this kind, rational geometry, as may be supposed, presents no obstacles. Habituated to contemplate relationships of form and quantity, and vaguely perceiving from time to time the necessity of certain results as reached by certain means, the pupil comes to regard the demonstrations of Euclid as the missing supplements to his familiar problems. His well-disciplined faculties enable him easily to master its successive propositions, and to appreciate their value; and he has the occasional gratification of finding some of his own methods proved to be true. Thus he enjoys what is to the unprepared a dreary task. It only remains to add, that his mind will presently arrive at a fit condition for that most valuable of all exercises for the reflective faculties—the making of original demonstrations.

* Those who seek aid in carrying out the system of culture above described, will find it in a little work entitled "Inventional Geometry;" published by J. and C. Mozley, Paternoster Row, London.

Such theorems as those appended to the successive books of the Messrs. Chambers's Euclid, will soon become practicable to him; and in proving them, the process of self-development will be not intellectual only, but moral.

To continue these suggestions much further, would be to write a detailed treatise on education, which we do not purpose. The foregoing outlines of plans for exercising the perceptions in early childhood, for conducting object-lessons, for teaching drawing and geometry, must be considered simply as illustrations of the method dictated by the general principles previously specified. We believe that on examination they will be found not only to progress from the simple to the complex, from the indefinite to the definite, from the concrete to the abstract, from the empirical to the rational; but to satisfy the further requirements, that education shall be a repetition of civilization in little, that it shall be as much as possible a process of self-evolution, and that it shall be pleasurable. The fulfilment of all these conditions by one type of method, tends alike to verify the conditions, and to prove that type of method the right one. Mark too, that this method is the logical outcome of the tendency characterizing all modern improvements in tuition—that it is but an adoption in full of the natural system which they adopt partially—that it displays this complete adoption of the natural system, both by conforming to the above principles, and by following the suggestions which the unfolding mind itself gives: facilitating its spontaneous activities, and so aiding the developments which Nature is busy with. Thus there seems abundant reason to conclude, that the mode of procedure above exemplified, closely approximates to the true one.

A few paragraphs must be added in further inculcation of the two general principles, that are alike the most important and the least attended to: namely, the principle that throughout youth, as in early childhood and in maturity, the process

shall be one of self-instruction; and the obverse principle, that the mental action induced shall be throughout intrinsically grateful. If progression from simple to complex, from indefinite to definite, and from concrete to abstract, be considered the essential requirements as dictated by abstract psychology; then do the requirements that knowledge shall be self-mastered, and pleasurably mastered, become tests by which we may judge whether the dictates of abstract psychology are being obeyed. If the first embody the leading generalizations of the *science* of mental growth, the last are the chief canons of the *art* of fostering mental growth. For manifestly, if the steps in our *curriculum* are so arranged that they can be successively ascended by the pupil himself with little or no help, they must correspond with the stages of evolution in his faculties; and manifestly, if the successive achievements of these steps are intrinsically gratifying to him, it follows that they require no more than a normal exercise of his powers.

But making education a process of self-evolution, has other advantages than this of keeping our lessons in the right order. In the first place, it guarantees a vividness and permanency of impression which the usual methods can never produce. Any piece of knowledge which the pupil has himself acquired —any problem which he has himself solved, becomes, by virtue of the conquest, much more thoroughly his than it could else be. The preliminary activity of mind which his success implies, the concentration of thought necessary to it, and the excitement consequent on his triumph, conspire to register the facts in his memory in a way that no mere information heard from a teacher, or read in a school-book, can be registered. Even if he fails, the tension to which his faculties have been wound up, insures his remembrance of the solution when given to him, better than half-a-dozen repetitions would. Observe, again, that this discipline necessitates a continuous organization of the knowledge he acquires. It is in the very nature of facts and inferences assimilated in this normal manner,

that they successively become the premises of further conclusions—the means of solving further questions. The solution of yesterday's problem helps the pupil in mastering to-day's. Thus the knowledge is turned into faculty as soon as it is taken in, and forthwith aids in the general function of thinking—does not lie merely written on the pages of an internal library, as when rote-learnt. Mark further, the moral culture which this constant self-help involves. Courage in attacking difficulties, patient concentration of the attention, perseverance through failures—these are characteristics which after-life specially requires; and these are characteristics which this system of making the mind work for its food specially produces. That it is thoroughly practicable to carry out instruction after this fashion, we can ourselves testify; having been in youth thus led to solve the comparatively complex problems of perspective. And that leading teachers have been tending in this direction, is indicated alike in the saying of Fellenberg, that "the individual, independent activity of the pupil is of much greater importance than the ordinary busy officiousness of many who assume the office of educators;" in the opinion of Horace Mann, that "unfortunately education amongst us at present consists too much in *telling*, not in *training*;" and in the remark of M. Marcel, that "what the learner discovers by mental exertion is better known than what is told to him."

Similarly with the correlative requirement, that the method of culture pursued shall be one productive of an intrinsically happy activity,—an activity not happy because of extrinsic rewards to be obtained, but because of its own healthfulness. Conformity to this requirement, besides preventing us from thwarting the normal process of evolution, incidentally secures positive benefits of importance. Unless we are to return to an ascetic morality (or rather *im*-morality) the maintenance of youthful happiness must be considered as in itself a worthy aim. Not to dwell upon this, however, we go on to remark that a pleasurable state of feeling is far more favourable to

intellectual action than a state of indifference or disgust. Every one knows that things read, heard, or seen with interest, are better remembered than things read, heard, or seen with apathy. In the one case the faculties appealed to are actively occupied with the subject presented; in the other they are inactively occupied with it, and the attention is continually drawn away by more attractive thoughts. Hence the impressions are respectively strong and weak. Moreover, to the intellectual listlessness which a pupil's lack of interest in any study involves, must be added the paralyzing fear of consequences. This, by distracting his attention, increases the difficulty he finds in bringing his faculties to bear upon facts that are repugnant to them. Clearly, therefore, the efficiency of tuition will, other things equal, be proportionate to the gratification with which tasks are performed.

It should be considered also, that grave moral consequences depend upon the habitual pleasure or pain which daily lessons produce. No one can compare the faces and manners of two boys—the one made happy by mastering interesting subjects, and the other made miserable by disgust with his studies, by consequent inability, by cold looks, by threats, by punishment—without seeing that the disposition of the one is being benefited, and that of the other injured. Whoever has marked the effects of success and failure upon the mind, and the power of the mind over the body; will see that in the one case both temper and health are favourably affected, while in the other there is danger of permanent moroseness, of permanent timidity, and even of permanent constitutional depression. There remains yet another indirect result of no small moment. The relationship between teachers and their pupils is, other things equal, rendered friendly and influential, or antagonistic and powerless, according as the system of culture produces happiness or misery. Human beings are at the mercy of their associated ideas. A daily minister of pain cannot fail to be regarded with secret dislike; and if he causes no emotions but painful ones, will inevitably be hated. Con-

versely, he who constantly aids children to their ends, hourly provides them with the satisfactions of conquest, hourly encourages them through their difficulties and sympathizes in their successes, will be liked; nay, if his behaviour is consistent throughout, must be loved. And when we remember how efficient and benign is the control of a master who is felt to be a friend, when compared with the control of one who is looked upon with aversion, or at best indifference, we may infer that the indirect advantages of conducting education on the happiness-principle do not fall far short of the direct ones. To all who question the possibility of acting out the system here advocated, we reply as before, that not only does theory point to it, but experience commends it. To the many verdicts of distinguished teachers who since Pestalozzi's time have testified this, may be here added that of Professor Pillans, who asserts that "where young people are taught as they ought to be, they are quite as happy in school as at play, seldom less delighted, nay, often more, with the well-directed exercise of their mental energies, than with that of their muscular powers."

As suggesting a final reason for making education a process of self-instruction, and by consequence a process of pleasurable instruction, we may advert to the fact that, in proportion as it is made so, is there a probability that it will not cease when school-days end. As long as the acquisition of knowledge is rendered habitually repugnant, so long will there be a prevailing tendency to discontinue it when free from the coercion of parents and masters. And when the acquisition of knowledge has been rendered habitually gratifying, then will there be as prevailing a tendency to continue, without superintendence, that self-culture previously carried on under superintendence. These results are inevitable. While the laws of mental association remain true—while men dislike the things and places that suggest painful recollections, and delight in those which call to mind by-gone pleasures—painful lessons will make knowledge repulsive, and pleasurable

lessons will make it attractive. The men to whom in boyhood information came in dreary tasks along with threats of punishment, and who were never led into habits of independent inquiry, are unlikely to be students in after years; while those to whom it came in the natural forms, at the proper times, and who remember its facts as not only interesting in themselves, but as the occasions of a long series of gratifying successes, are likely to continue through life that self-instruction commenced in youth.

CHAPTER III.

MORAL EDUCATION.

The greatest defect in our programmes of education is entirely overlooked. While much is being done in the detailed improvement of our systems in respect both of matter and manner, the most pressing desideratum has not yet been even recognized as a desideratum. To prepare the young for the duties of life, is tacitly admitted to be the end which parents and schoolmasters should have in view; and happily, the value of the things taught, and the goodness of the methods followed in teaching them, are now ostensibly judged by their fitness to this end. The propriety of substituting for an exclusively classical training, a training in which the modern languages shall have a share, is argued on this ground. The necessity of increasing the amount of science is urged for like reasons. But though some care is taken to fit youth of both sexes for society and citizenship, no care whatever is taken to fit them for the position of parents. While it is seen that for the purpose of gaining a livelihood, an elaborate preparation is needed, it appears to be thought that for the bringing up of children, no preparation whatever is needed. While many years are spent by a boy in gaining knowledge of which the chief value is that it constitutes 'the education of a gentleman;' and while many years are spent by a girl in those decorative acquirements which fit her for evening parties; not an hour is spent by either in preparation for that gravest of all responsibilities—the management of a family. Is it

that this responsibility is but a remote contingency? On the contrary, it is sure to devolve on nine out of ten. Is it that the discharge of it is easy? Certainly not: of all functions which the adult has to fulfil, this is the most difficult. Is it that each may be trusted by self-instruction to fit himself, or herself, for the office of parent? No: not only is the need for such self-instruction unrecognized, but the complexity of the subject renders it the one of all others in which self-instruction is least likely to succeed. No rational plea can be put forward for leaving the Art of Education out of our *curriculum*. Whether as bearing on the happiness of parents themselves, or whether as affecting the characters and lives of their children and remote descendants, we must admit that a knowledge of the right methods of juvenile culture, physical, intellectual, and moral, is a knowledge of extreme importance. This topic should be the final one in the course of instruction passed through by each man and woman. As physical maturity is marked by the ability to produce offspring; so, mental maturity is marked by the ability to train those offspring. *The subject which involves all other subjects, and therefore the subject in which education should culminate, is the Theory and Practice of Education.*

In the absence of this preparation, the management of children, and more especially the moral management, is lamentably bad. Parents either never think about the matter at all, or else their conclusions are crude and inconsistent. In most cases, and especially on the part of mothers, the treatment adopted on every occasion is that which the impulse of the moment prompts: it springs not from any reasoned-out conviction as to what will most benefit the child, but merely expresses the dominant parental feelings, whether good or ill; and varies from hour to hour as these feelings vary. Or if the dictates of passion are supplemented by any definite doctrines and methods, they are those handed down from the past, or those suggested by the remembrances of childhood, or those adopted from nurses and servants—methods

devised not by the enlightenment, but by the ignorance, of the time. Commenting on the chaotic state of opinion and practice relative to family-government, Richter writes:—

"If the secret variances of a large class of ordinary fathers were brought to light, and laid down as a plan of studies and reading, catalogued for a moral education, they would run somewhat after this fashion:—In the first hour 'pure morality must be read to the child, either by myself or the tutor;' in the second, 'mixed morality, or that which may be applied to one's own advantage;' in the third, 'do you not see that your father does so and so?' in the fourth, 'you are little, and this is only fit for grown-up people;' in the fifth, 'the chief matter is that you should succeed in the world, and become something in the state;' in the sixth, 'not the temporary, but the eternal, determines the worth of a man;' in the seventh, 'therefore rather suffer injustice, and be kind;' in the eighth, 'but defend yourself bravely if any one attack you;' in the ninth, 'do not make a noise, dear child;' in the tenth, 'a boy must not sit so quiet;' in the eleventh, 'you must obey your parents better;' in the twelfth, 'and educate yourself.' So by the hourly change of his principles, the father conceals their untenableness and onesidedness. As for his wife, she is neither like him, nor yet like that harlequin who came on to the stage with a bundle of papers under each arm, and answered to the inquiry, what he had under his right arm, 'orders,' and to what he had under his left arm, 'counter-orders.' But the mother might be much better compared to a giant Briareus, who had a hundred arms, and a bundle of papers under each."

This state of things is not to be readily changed. Generations must pass before a great amelioration of it can be expected. Like political constitutions, educational systems are not made, but grow; and within brief periods growth is insensible. Slow, however, as must be any improvement, even that improvement implies the use of means; and among the means is discussion.

We are not among those who believe in Lord Palmerston's dogma, that "all children are born good." On the whole, the opposite dogma, untenable as it is, seems to us less wide of the truth. Nor do we agree with those who think that, by skilful discipline, children may be made altogether what they should be. Contrariwise, we are satisfied that though imperfections of nature may be diminished by wise management, they cannot be removed by it. The notion that an ideal

humanity might be forthwith produced by a perfect system of education, is near akin to that implied in the poems of Shelley, that would mankind give up their old institutions and prejudices, all the evils in the world would at once disappear: neither notion being acceptable to such as have dispassionately studied human affairs.

Nevertheless, we may fitly sympathize with those who entertain these too sanguine hopes. Enthusiasm, pushed even to fanaticism, is a useful motive-power—perhaps an indispensable one. It is clear that the ardent politician would never undergo the labours and make the sacrifices he does, did he not believe that the reform he fights for is the one thing needful. But for his conviction that drunkenness is the root of all social evils, the teetotaller would agitate far less energetically. In philanthropy, as in other things, great advantage results from division of labour; and that there may be division of labour, each class of philanthropists must be more or less subordinated to its function—must have an exaggerated faith in its work. Hence, of those who regard education, intellectual or moral, as the panacea, we may say that their undue expectations are not without use; and that perhaps it is part of the beneficent order of things that their confidence cannot be shaken.

Even were it true, however, that by some possible system of moral control, children could be moulded into the desired form; and even could every parent be indoctrinated with this system; we should still be far from achieving the object in view. It is forgotten that the carrying out of any such system presupposes, on the part of adults, a degree of intelligence, of goodness, of self-control, possessed by no one. The error made by those who discuss questions of domestic discipline, lies in ascribing all the faults and difficulties to the children, and none to the parents. The current assumption respecting family government, as respecting national government, is, that the virtues are with the rulers and the vices with the ruled. Judging by educational theories, men and women are entirely transfigured in their relations to offspring. The citizens we do business with, the people

we meet in the world, we know to be very imperfect creatures. In the daily scandals, in the quarrels of friends, in bankruptcy disclosures, in lawsuits, in police reports, we have constantly thrust before us the pervading selfishness, dishonesty, brutality. Yet when we criticise nursery-management and canvass the misbehaviour of juveniles, we habitually take for granted that these culpable persons are free from moral delinquency in the treatment of their boys and girls! So far is this from the truth, that we do not hesitate to blame parental misconduct for a great part of the domestic disorder commonly ascribed to the perversity of children. We do not assert this of the more sympathetic and self-restrained, among whom we hope most of our readers may be classed; but we assert it of the mass. What kind of moral culture is to be expected from a mother who, time after time, angrily shakes her infant because it will not suck; which we once saw a mother do? How much sense of justice is likely to be instilled by a father who, on having his attention drawn by a scream to the fact that his child's finger is jammed between the window-sash and the sill, begins to beat the child instead of releasing it? Yet that there are such fathers is testified to us by an eye-witness. Or, to take a still stronger case, also vouched for by direct testimony—what are the educational prospects of the boy who, on being taken home with a dislocated thigh, is saluted with a castigation? It is true that these are extreme instances —instances exhibiting in human beings that blind instinct which impels brutes to destroy the weakly and injured of their own race. But extreme though they are, they typify feelings and conduct daily observable in many families. Who has not repeatedly seen a child slapped by nurse or parent for a fretfulness probably resulting from bodily derangement? Who, when watching a mother snatch up a fallen little one, has not often traced, both in the rough manner and in the sharply-uttered exclamation—'You stupid little thing!'—an irascibility foretelling endless future squabbles? Is there not in the harsh tones in which a father bids his children be quiet, evi-

dence of a deficient fellow-feeling with them? Are not the constant, and often quite needless, thwartings that the young experience—the injunctions to sit still, which an active child cannot obey without suffering great nervous irritation, the commands not to look out of the window when travelling by railway, which on a child of any intelligence entails serious deprivation—are not these thwartings, we ask, signs of a terrible lack of sympathy? The truth is, that the difficulties of moral education are necessarily of dual origin—necessarily result from the combined faults of parents and children. If hereditary transmission is a law of nature, as every naturalist knows it to be, and as our daily remarks and current proverbs admit it to be; then, on the average of cases, the defects of children mirror the defects of their parents;—on the average of cases, we say, because, complicated as the results are by the transmitted traits of remoter ancestors, the correspondence is not special but only general. And if, on the average of cases, this inheritance of defects exists, then the evil passions which parents have to check in their children, imply like evil passions in themselves: hidden, it may be, from the public eye; or perhaps obscured by other feelings; but still there. Evidently, therefore, the general practice of any ideal system of discipline is hopeless: parents are not good enough.

Moreover, even were there methods by which the desired end could be at once effected; and even had fathers and mothers sufficient insight, sympathy, and self-command to employ these methods consistently; it might still be contended that it would be of no use to reform family-government faster than other things are reformed. What is it that we aim to do? Is it not that education of whatever kind, has for its proximate end to prepare a child for the business of life—to produce a citizen who, while he is well conducted, is also able to make his way in the world? And does not making his way in the world (by which we mean, not the acquirement of wealth, but of the funds requisite for bringing-up a family)

—does not this imply a certain fitness for the world as it now is? And if by any system of culture an ideal human being could be produced, is it not doubtful whether he would be fit for the world as it now is? May we not, on the contrary, suspect that his too keen sense of rectitude, and too elevated standard of conduct, would make life intolerable or even impossible? And however admirable the result might be, considered individually, would it not be self-defeating in so far as society and posterity are concerned? There is much reason for thinking that as in a nation so in a family, the kind of government is, on the whole, about as good as the general state of human nature permits it to be. We may argue that in the one case, as in the other, the average character of the people determines the quality of the control exercised. In both cases it may be inferred that amelioration of the average character leads to an amelioration of system; and further, that were it impossible to ameliorate the system without the average character being first ameliorated, evil rather than good would follow. Such degree of harshness as children now experience from their parents and teachers, may be regarded as but a preparation for that greater harshness which they will meet with on entering the world. And it may be urged that were it possible for parents and teachers to treat them with perfect equity and entire sympathy, it would but intensify the sufferings which the selfishness of men must, in after life, inflict on them.*

* Of this nature is the plea put in by some for the rough treatment experienced by boys at our public schools; where, as it is said, they are introduced to a miniature world whose hardships prepare them for those of the real world. It must be admitted that the plea has some force; but it is a very insufficient plea. For whereas domestic and school discipline, though they should not be much better than the discipline of adult life, should be somewhat better; the discipline which boys meet with at Eton, Winchester, Harrow, &c., is worse than that of adult life—more unjust and cruel. Instead of being an aid to human progress which all culture should be, the culture of our public schools, by accustoming boys to a despotic form of government and an intercourse regulated by brute force, tends to fit them for a lower state of society than that which exists. And chiefly recruited as our legislature is from among those who are brought up at such schools, this barbarizing influence becomes a hindrance to national progress.

"But does not this prove too much?" some one will ask. "If no system of moral training can forthwith make children what they should be; if, even were there a system that would do this, existing parents are too imperfect to carry it out; and if even could such a system be successfully carried out, its results would be disastrously incongruous with the present state of society; does it not follow that to reform the system now in use, is neither practicable nor desirable?" No. It merely follows that reform in domestic government must go on, *pari passu*, with other reforms. It merely follows that methods of discipline neither can be nor should be ameliorated, except by instalments. It merely follows that the dictates of abstract rectitude will, in practice, inevitably be subordinated by the present state of human nature—by the imperfections alike of children, of parents, and of society; and can only be better fulfilled as the general character becomes better.

"At any rate, then," may rejoin our critic, "it is clearly useless to set up any ideal standard of family discipline. There can be no advantage in elaborating and recommending methods that are in advance of the time." Again we contend for the contrary. Just as in the case of political government, though pure rectitude may be at present impracticable, it is requisite to know where the right lies, in order that the changes we make may be *towards* the right instead of *away* from it; so, in the case of domestic government, an ideal must be upheld, that there may be gradual approximations to it. We need fear no evil consequences from the maintenance of such an ideal. On the average the constitutional conservatism of mankind is strong enough to prevent too rapid a change. Things are so organized that until men have grown up to the level of a higher belief, they cannot receive it: nominally, they may hold it, but not virtually. And even when the truth gets recognized, the obstacles to conformity with it are so persistent as to outlive the patience of philanthropists and even of philosophers. We may be sure,

therefore, that the difficulties in the way of a normal government of children, will always put an adequate check upon the efforts to realize it.

With these preliminary explanations, let us go on to consider the true aims and methods of moral education. After a few pages devoted to the settlement of general principles, during the perusal of which we bespeak the reader's patience, we shall aim by illustrations to make clear the right methods of parental behaviour in the hourly occurring difficulties of family government.

When a child falls, or runs its head against the table, it suffers a pain, the remembrance of which tends to make it more careful; and by repetition of such experiences, it is eventually disciplined into proper guidance of its movements. If it lays hold of the fire-bars, thrusts its hand into a candle-flame, or spills boiling water on any part of its skin, the resulting burn or scald is a lesson not easily forgotten. So deep an impression is produced by one or two events of this kind, that no persuasion will afterwards induce it thus to disregard the laws of its constitution.

Now in these cases, Nature illustrates to us in the simplest way, the true theory and practice of moral discipline—a theory and practice which, however much they may seem to the superficial like those commonly received, we shall find on examination to differ from them very widely.

Observe, first, that in bodily injuries and their penalties we have misconduct and its consequences reduced to their simplest forms. Though, according to their popular acceptations, *right* and *wrong* are words scarcely applicable to actions that have none but direct bodily effects; yet whoever considers the matter will see that such actions must be as much classifiable under these heads as any other actions. From whatever assumption they start, all theories of morality agree that conduct whose total results, immediate and remote, are beneficial, is good conduct; while conduct whose total results,

immediate and remote, are injurious, is bad conduct. The *ultimate* standards by which all men judge of behaviour, are the resulting happiness or misery. We consider drunkenness wrong because of the physical degeneracy and accompanying moral evils entailed on the drunkard and his dependents. Did theft give pleasure both to taker and loser, we should not find it in our catalogue of sins. Were it conceivable that kind actions multiplied human sufferings, we should condemn them—should not consider them kind. It needs but to read the first newspaper-leader, or listen to any conversation on social affairs, to see that acts of parliament, political movements, philanthropic agitations, in common with the doings of individuals, are judged by their anticipated results in augmenting the pleasures or pains of men. And if on analyzing all secondary, superinduced ideas, we find these to be our final tests of right and wrong, we cannot refuse to class bodily conduct as right or wrong according to the beneficial or detrimental results produced.

Note, in the second place, the character of the punishments by which these physical transgressions are prevented. Punishments, we call them, in the absence of a better word; for they are not punishments in the literal sense. They are not artificial and unnecessary inflictions of pain; but are simply the beneficent checks to actions that are essentially at variance with bodily welfare—checks in the absence of which life would be quickly destroyed by bodily injuries. It is the peculiarity of these penalties, if we must so call them, that they are simply the *unavoidable consequences* of the deeds which they follow: they are nothing more than the *inevitable reactions* entailed by the child's actions.

Let it be further borne in mind that these painful reactions are proportionate to the transgressions. A slight accident brings a slight pain; a more serious one, a severer pain. It is not ordained that an urchin who tumbles over the doorstep, shall suffer in excess of the amount necessary; with the view of making it still more cautious than the necessary

suffering will make it. But from its daily experience it is left to learn the greater or less penalties of greater or less errors; and to behave accordingly.

And then mark, lastly, that these natural reactions which follow the child's wrong actions, are constant, direct, unhesitating, and not to be escaped. No threats; but a silent, rigorous performance. If a child runs a pin into its finger, pain follows. If it does it again, there is again the same result: and so on perpetually. In all its dealings with inorganic Nature it finds this unswerving persistence, which listens to no excuse, and from which there is no appeal; and very soon recognizing this stern though beneficent discipline, it becomes extremely careful not to transgress.

Still more significant will these general truths appear, when we remember that they hold throughout adult life as well as throughout infantine life. It is by an experimentally-gained knowledge of the natural consequences, that men and women are checked when they go wrong. After home-education has ceased, and when there are no longer parents and teachers to forbid this or that kind of conduct, there comes into play a discipline like that by which the young child is trained to self-guidance. If the youth entering on the business of life idles away his time and fulfils slowly or unskilfully the duties entrusted to him, there by-and-by follows the natural penalty: he is discharged, and left to suffer for awhile the evils of a relative poverty. On the unpunctual man, ever missing his appointments of business and pleasure, there continually fall the consequent inconveniences, losses, and deprivations. The tradesman who charges too high a rate of profit, loses his customers, and so is checked in his greediness. Diminishing practice teaches the inattentive doctor to bestow more trouble on his patients. The too credulous creditor and the over-sanguine speculator, alike learn by the difficulties which rashness entails on them, the necessity of being more cautious in their engagements. And so throughout the life of every citizen. In the quotation so

often made *apropos* of such cases—"The burnt child dreads the fire"—we see not only that the analogy between this social discipline and Nature's early discipline of infants is universally recognized; but we also see an implied conviction that this discipline is of the most efficient kind. Nay indeed, this conviction is more than implied; it is distinctly stated. Every one has heard others confess that only by "dearly bought experience" had they been induced to give up some bad or foolish course of conduct formerly pursued. Every one has heard, in the criticisms passed on the doings of this spendthrift or the other schemer, the remark that advice was useless, and that nothing but "bitter experience" would produce any effect: nothing, that is, but suffering the unavoidable consequences. And if further proof be needed that the natural reaction is not only the most efficient penalty, but that no humanly-devised penalty can replace it, we have such further proof in the notorious ill-success of our various penal systems. Out of the many methods of criminal discipline that have been proposed and legally enforced, none have answered the expectations of their advocates. Artificial punishments have failed to produce reformation; and have in many cases increased the criminality. The only successful reformatories are those privately-established ones which approximate their *régime* to the method of Nature—which do little more than administer the natural consequences of criminal conduct: diminishing the criminal's liberty of action as much as is needful for the safety of society, and requiring him to maintain himself while living under this restraint. Thus we see, both that the discipline by which the young child is taught to regulate its movements is the discipline by which the great mass of adults are kept in order, and more or less improved; and that the discipline humanly-devised for the worst adults, fails when it diverges from this divinely-ordained discipline, and begins to succeed on approximating to it.

Have we not here, then, the guiding principle of moral

education? Must we not infer that the system so beneficent in its effects during infancy and maturity, will be equally beneficent throughout youth? Can any one believe that the method which answers so well in the first and the last divisions of life, will not answer in the intermediate division? Is it not manifest that as "ministers and interpreters of Nature" it is the function of parents to see that their children habitually experience the true consequences of their conduct—the natural reactions: neither warding them off, nor intensifying them, nor putting artificial consequences in place of them? No unprejudiced reader will hesitate in his assent.

Probably, however, not a few will contend that already most parents do this—that the punishments they inflict are, in the majority of cases, the true consequences of ill-conduct—that parental anger, venting itself in harsh words and deeds, is the result of a child's transgression—and that, in the suffering, physical or moral, which the child is subject to, it experiences the natural reaction of its misbehaviour. Along with much error this assertion contains some truth It is unquestionable that the displeasure of fathers and mothers is a true consequence of juvenile delinquency; and that the manifestation of it is a normal check upon such delinquency. The scoldings, and threats, and blows, which a passionate parent visits on offending little ones, are doubtless effects actually drawn from such a parent by their offences; and so are, in some sort, to be considered as among the natural reactions of their wrong actions. Nor are we prepared to say that these modes of treatment are not relatively right—right, that is, in relation to the uncontrollable children of ill-controlled adults; and right in relation to a state of society in which such ill-controlled adults make up the mass of the people. As already suggested, educational systems, like political and other institutions, are generally as good as the state of human nature permits. The barbarous children of barbarous parents are probably only to be restrained by the barbarous methods which such parents spontaneously employ; while submission

to these barbarous methods is perhaps the best preparation such children can have for the barbarous society in which they are presently to play a part. Conversely, the civilized members of a civilized society will spontaneously manifest their displeasure in less violent ways—will spontaneously use milder measures: measures strong enough for their better-natured children. Thus it is true that, in so far as the expression of parental feeling is concerned, the principle of the natural reaction is always more or less followed. The system of domestic government ever gravitates towards its right form.

But now observe two important facts. The first fact is that, in states of rapid transition like ours, which witness a continuous battle between old and new theories and old and new practices, the educational methods in use are apt to be considerably out of harmony with the times. In deference to dogmas fit only for the ages that uttered them, many parents inflict punishments that do violence to their own feelings, and so visit on their children *un*natural reactions; while other parents, enthusiastic in their hopes of immediate perfection, rush to the opposite extreme. The second fact is, that the discipline of chief value is not the experience of parental approbation or disapprobation; but it is the experience of those results which would ultimately flow from the conduct in the absence of parental opinion or interference. The truly instructive and salutary consequences are not those inflicted by parents when they take upon themselves to be Nature's proxies; but they are those inflicted by Nature herself. We will endeavour to make this distinction clear by a few illustrations, which, while they show what we mean by natural reactions as contrasted with artificial ones, will afford some practical suggestions.

In every family where there are young children there daily occur cases of what mothers and servants call "making a litter." A child has had out its box of toys, and leaves them scattered about the floor. Or a handful of flowers, brought in from a morning walk, is presently seen dispersed over tables

and chairs. Or a little girl, making doll's-clothes, disfigures the room with shreds. In most cases the trouble of rectifying this disorder falls anywhere but where it should. Occurring in the nursery, the nurse herself, with many grumblings about "tiresome little things," undertakes the task; if below-stairs, the task usually devolves either on one of the elder children or on the housemaid: the transgressor being visited with nothing more than a scolding. In this very simple case, however, there are many parents wise enough to follow out, more or less consistently, the normal course—that of making the child itself collect the toys or shreds. The labour of putting things in order, is the true consequence of having put them in disorder. Every trader in his office, every wife in her household, has daily experience of this fact. And if education be a preparation for the business of life, then every child should also, from the beginning, have daily experience of this fact. If the natural penalty be met by refractory behaviour (which it may perhaps be where the system of moral discipline previously pursued has been bad), then the proper course is to let the child feel the ulterior reaction caused by its disobedience. Having refused or neglected to pick up and put away the things it has scattered about, and having thereby entailed the trouble of doing this on some one else, the child should, on subsequent occasions, be denied the means of giving this trouble. When next it petitions for its toy-box, the reply of its mamma should be—"The last time you had your toys you left them lying on the floor, and Jane had to pick them up. Jane is too busy to pick up every day the things you leave about; and I cannot do it myself. So that, as you will not put away your toys when you have done with them, I cannot let you have them." This is obviously a natural consequence, neither increased nor lessened; and must be so recognized by a child. The penalty comes, too, at the moment when it is most keenly felt. A new-born desire is balked at the moment of anticipated gratification; and the strong impression so produced can scarcely fail to have an effect on the

future conduct: an effect which, by consistent repetition, will do whatever can be done in curing the fault. Add to which, that, by this method, a child is early taught the lesson which cannot be learnt too soon, that in this world of ours pleasures are rightly to be obtained only by labour.

Take another case. Not long since we had frequently to hear the reprimands visited on a little girl who was scarcely ever ready in time for the daily walk. Of eager disposition, and apt to become absorbed in the occupation of the moment, Constance never thought of putting on her things till the rest were ready. The governess and the other children had almost invariably to wait; and from the mamma there almost invariably came the same scolding. Utterly as this system failed, it never occurred to the mamma to let Constance experience the natural penalty. Nor, indeed, would she try it when it was suggested to her. In the world, unreadiness entails the loss of some advantage that would else have been gained: the train is gone; or the steam-boat is just leaving its moorings; or the best things in the market are sold; or all the good seats in the concert-room are filled. And every one, in cases perpetually occurring, may see that it is the prospective deprivations which prevent people from being too late. Is not the inference obvious? Should not the prospective deprivations control a child's conduct also? If Constance is not ready at the appointed time, the natural result is that of being left behind, and losing her walk. And after having once or twice remained at home while the rest were enjoying themselves in the fields—after having felt that this loss of a much-prized gratification was solely due to want of promptitude; amendment would in all probability take place. At any rate, the measure would be more effective than that perpetual scolding which ends only in producing callousness.

Again, when children, with more than usual carelessness, break or lose the things given to them, the natural penalty—the penalty which makes grown-up persons more careful—is the consequent inconvenience. The lack of the lost or

damaged article, and the cost of replacing it, are the experiences by which men and women are disciplined in these matters; and the experiences of children should be as much as possible assimilated to theirs. We do not refer to that early period at which toys are pulled to pieces in the process of learning their physical properties, and at which the results of carelessness cannot be understood; but to a later period, when the meaning and advantages of property are perceived. When a boy, old enough to possess a penknife, uses it so roughly as to snap the blade, or leaves it in the grass by some hedge-side where he was cutting a stick, a thoughtless parent, or some indulgent relative, will commonly forthwith buy him another; not seeing that, by doing this, a valuable lesson is prevented. In such a case, a father may properly explain that penknives cost money, and that to get money requires labour; that he cannot afford to purchase new penknives for one who loses or breaks them; and that until he sees evidence of greater carefulness he must decline to make good the loss. A parallel discipline will serve to check extravagance.

These few familiar instances, here chosen because of the simplicity with which they illustrate our point, will make clear to every one the distinction between those natural penalties which we contend are the truly efficient ones, and those artificial penalties commonly substituted for them. Before going on to exhibit the higher and subtler applications of the principle exemplified, let us note its many and great superiorities over the principle, or rather the empirical practice, which prevails in most families.

One superiority is that the pursuance of it generates right conceptions of cause and effect; which by frequent and consistent experience are eventually rendered definite and complete. Proper conduct in life is much better guaranteed when the good and evil consequences of actions are understood, than when they are merely believed on authority. A child who finds that disorderliness entails the trouble of putting things in order, or who misses a gratification from

dilatoriness, or whose carelessness is followed by the want of some much-prized possession, not only suffers a keenly-felt consequence, but gains a knowledge of causation: both the one and the other being just like those which adult life will bring. Whereas a child who in such cases receives a reprimand, or some factitious penalty, not only experiences a consequence for which it often cares very little, but misses that instruction respecting the essential natures of good and evil conduct, which it would else have gathered. It is a vice of the common system of artificial rewards and punishments, long since noticed by the clear-sighted, that by substituting for the natural results of misbehaviour certain tasks or castigations, it produces a radically wrong moral standard. Having throughout infancy and boyhood always regarded parental or tutorial displeasure as the chief result of a forbidden action, the youth has gained an established association of ideas between such action and such displeasure, as cause and effect. Hence when parents and tutors have abdicated, and their displeasure is not to be feared, the restraints on forbidden actions are in great measure removed: the true restraints, the natural reactions, having yet to be learnt by sad experience. As writes one who has had personal knowledge of this short-sighted system:—"Young men let loose from school, particularly those whose parents have neglected to exert their influence, plunge into every description of extravagance; they know no rule of action—they are ignorant of the reasons for moral conduct—they have no foundation to rest upon—and until they have been severely disciplined by the world are extremely dangerous members of society."

Another great advantage of this natural discipline is, that it is a discipline of pure justice; and will be recognized as such by every child. Whoso suffers nothing more than the evil which in the order of nature results from his own misbehaviour, is much less likely to think himself wrongly treated than if he suffers an artificially inflicted evil; and this will hold of children as of men. Take the case of a boy who is

habitually reckless of his clothes—scrambles through hedges without caution, or is utterly regardless of mud. If he is beaten, or sent to bed, he is apt to consider himself ill-used; and is more likely to brood over his injuries than to repent of his transgressions. But suppose he is required to rectify as far as possible the harm he has done—to clean off the mud with which he has covered himself, or to mend the tear as well as he can. Will he not feel that the evil is one of his own producing? Will he not while paying this penalty be continuously conscious of the connexion between it and its cause? And will he not, spite his irritation, recognize more or less clearly the justice of the arrangement? If several lessons of this kind fail to produce amendment—if suits of clothes are prematurely spoiled—if the father, pursuing this same system of discipline, declines to spend money for new ones until the ordinary time has elapsed—and if meanwhile, there occur occasions on which, having no decent clothes to go in, the boy is debarred from joining the rest of the family on holiday excursions and *fête* days, it is manifest that while he will keenly feel the punishment, he can scarcely fail to trace the chain of causation, and to perceive that his own carelessness is the origin of it. And seeing this, he will not have any such sense of injustice as if there were no obvious connexion between the transgression and its penalty.

Again, the tempers both of parents and children are much less liable to be ruffled under this system than under the ordinary system. When instead of letting children experience the painful results which naturally follow from wrong conduct, parents themselves inflict certain other painful results, they produce double mischief. Making, as they do, multiplied family laws; and identifying their own supremacy and dignity with the maintenance of these laws; every transgression is regarded as an offence against themselves, and a cause of anger on their part. And then come the further vexations which result from taking upon themselves, in the shape of extra labour or cost, those evil consequences

which should have been allowed to fall on the wrong-doers. Similarly with the children. Penalties which the necessary reaction of things brings round upon them—penalties which are inflicted by impersonal agency, produce an irritation that is comparatively slight and transient; whereas, penalties voluntarily inflicted by a parent, and afterwards thought of as caused by him or her, produce an irritation both greater and more continued. Just consider how disastrous would be the result if this empirical method were pursued from the beginning. Suppose it were possible for parents to take upon themselves the physical sufferings entailed on their children by ignorance and awkwardness; and that while bearing these evil consequences they visited on their children certain other evil consequences, with the view of teaching them the impropriety of their conduct. Suppose that when a child, who had been forbidden to meddle with the kettle, spilt boiling water on its foot, the mother vicariously assumed the scald and gave a blow in place of it; and similarly in all other cases. Would not the daily mishaps be sources of far more anger than now? Would there not be chronic ill-temper on both sides? Yet an exactly parallel policy is pursued in after-years. A father who beats his boy for carelessly or wilfully breaking a sister's toy, and then himself pays for a new toy, does substantially this same thing—inflicts an artificial penalty on the transgressor, and takes the natural penalty on himself: his own feelings and those of the transgressor being alike needlessly irritated. Did he simply require restitution to be made, he would produce far less heart-burning. If he told the boy that a new toy must be bought at his, the boy's, cost; and that his supply of pocket-money must be withheld to the needful extent; there would be much less disturbance of temper on either side: while in the deprivation afterwards felt, the boy would experience the equitable and salutary consequence. In brief, the system of discipline by natural reactions is less injurious to temper, both because it is perceived to be nothing more than

pure justice, and because it in great part substitutes the impersonal agency of Nature for the personal agency of parents.

Whence also follows the manifest corollary, that under this system the parental and filial relation, being a more friendly, will be a more influential one. Whether in parent or child, anger, however caused, and to whomsoever directed, is detrimental. But anger in a parent towards a child, and in a child towards a parent, is especially detrimental; because it weakens that bond of sympathy which is essential to beneficent control. From the law of association of ideas, it inevitably results, both in young and old, that dislike is contracted towards things which in experience are habitually connected with disagreeable feelings. Or where attachment originally existed, it is diminished, or turned into repugnance, according to the quantity of painful impressions received. Parental wrath, venting itself in reprimands and castigations, cannot fail, if often repeated, to produce filial alienation; while the resentment and sulkiness of children cannot fail to weaken the affection felt for them, and may even end in destroying it. Hence the numerous cases in which parents (and especially fathers, who are commonly deputed to inflict the punishment) are regarded with indifference, if not with aversion; and hence the equally numerous cases in which children are looked upon as inflictions. Seeing then, as all must do, that estrangement of this kind is fatal to a salutary moral culture, it follows that parents cannot be too solicitous in avoiding occasions of direct antagonism with their children. And therefore they cannot too anxiously avail themselves of this discipline of natural consequences; which, by relieving them from penal functions, prevents mutual exasperations and estrangements.

The method of moral culture by experience of the normal reactions, which is the divinely-ordained method alike for infancy and for adult life, we thus find to be equally applicable during the intermediate childhood and youth. Among the advantages of this method we see:—First; that it gives

that rational knowledge of right and wrong conduct which results from personal experience of their good and bad consequences. Second; that the child, suffering nothing more than the painful effects of its own wrong actions, must recognize more or less clearly the justice of the penalties. Third; that recognizing the justice of the penalties, and receiving them through the working of things rather than at the hands of an individual, its temper is less disturbed; while the parent fulfilling the comparatively passive duty of letting the natural penalties be felt, preserves a comparative equanimity. Fourth; that mutual exasperations being thus prevented, a much happier, and a more influential relation, will exist between parent and child.

"But what is to be done in cases of more serious misconduct?" some will ask. "How is this plan to be carried out when a petty theft has been committed? or when a lie has been told? or when some younger brother or sister has been ill-used?"

Before replying to these questions, let us consider the bearings of a few illustrative facts.

Living in the family of his brother-in-law, a friend of ours had undertaken the education of his little nephew and niece. This he had conducted, more perhaps from natural sympathy than from reasoned-out conclusions, in the spirit of the method above set forth. The two children were in doors his pupils and out of doors his companions. They daily joined him in walks and botanizing excursions, eagerly sought plants for him, looked on while he examined and identified them, and in this and other ways were ever gaining pleasure and instruction in his society. In short, morally considered, he stood to them much more in the position of parent than either their father or mother did. Describing to us the results of this policy, he gave, among other instances, the following. One evening, having need for some article lying in another part of the house, he asked his nephew to fetch it.

Interested as the boy was in some amusement of the moment, he, contrary to his wont, either exhibited great reluctance or refused, we forget which. His uncle, disapproving of a coercive course, went himself for that which he wanted: merely exhibiting by his manner the annoyance this ill-behaviour gave him. And when, later in the evening, the boy made overtures for the usual play, they were gravely repelled—the uncle manifested just that coldness naturally produced in him; and so let the boy feel the necessary consequences of his conduct. Next morning at the usual time for rising, our friend heard a new voice outside the door, and in walked his little nephew with the hot water. Peering about the room to see what else could be done, the boy then exclaimed, "Oh! you want your boots;" and forthwith rushed down-stairs to fetch them. In this and other ways he showed a true penitence for his misconduct. He endeavoured by unusual services to make up for the service he had refused. His better feelings had made a real conquest over his lower ones; and acquired strength by the victory. And having felt what it was to be without it, he valued more than before the friendship he thus regained.

This gentleman is now himself a father; acts on the same system; and finds it answer completely. He makes himself thoroughly his children's friend. The evening is longed for by them because he will be at home; and they especially enjoy Sunday because he is with them all day. Thus possessing their perfect confidence and affection, he finds that the simple display of his approbation or disapprobation gives him abundant power of control. If, on his return home, he hears that one of his boys has been naughty, he behaves towards him with that coolness which the consciousness of the boy's misconduct naturally produces; and he finds this a most efficient punishment. The mere withholding of the usual caresses, is a source of much distress—produces a more prolonged fit of crying than a beating would do. And the dread of this purely moral penalty is, he says, ever present

during his absence: so much so, that frequently during the day his children ask their mamma how they have behaved, and whether the report will be good. Recently, the eldest, an active urchin of five, in one of those bursts of animal spirits common in healthy children, committed sundry extravagances during his mamma's absence—cut off part of his brother's hair and wounded himself with a razor taken from his father's dressing-case. Hearing of these occurrences on his return, the father did not speak to the boy either that night or next morning. Besides the immediate tribulation the effect was, that when, a few days after, the mamma was about to go out, she was entreated by the boy not to do so; and on inquiry, it appeared his fear was that he might again transgress in her absence.

We have introduced these facts before replying to the question—"What is to be done with the graver offences?" for the purpose of first exhibiting the relation that may and ought to be established between parents and children; for on the existence of this relation depends the successful treatment of these graver offences. And as a further preliminary, we must now point out that the establishment of this relation will result from adopting the system here advocated. Already we have shown that by simply letting a child experience the painful reactions of its own wrong actions, a parent avoids antagonism and escapes being regarded as an enemy; but it remains to be shown that where this course has been consistently pursued from the beginning, a feeling of active friendship will be generated.

At present, mothers and fathers are mostly considered by their offspring as friend-enemies. Determined as the impressions of children inevitably are by the treatment they receive; and oscillating as that treatment does between bribery and thwarting, between petting and scolding, between gentleness and castigation; they necessarily acquire conflicting beliefs respecting the parental character. A mother commonly thinks it sufficient to tell her little boy that she is his best friend;

and assuming that he ought to believe her, concludes that he will do so. "It is all for your good;" "I know what is proper for you better than you do yourself;" "You are not old enough to understand it now, but when you grow up you will thank me for doing what I do;"—these, and like assertions, are daily reiterated. Meanwhile the boy is daily suffering positive penalties; and is hourly forbidden to do this, that, and the other, which he wishes to do. By words he hears that his happiness is the end in view; but from the accompanying deeds he habitually receives more or less pain. Incompetent as he is to understand that future which his mother has in view, or how this treatment conduces to the happiness of that future, he judges by the results he feels; and finding such results anything but pleasurable, he becomes sceptical respecting her professions of friendship. And is it not folly to expect any other issue? Must not the child reason from the evidence he has got? and does not this evidence seem to warrant his conclusion? The mother would reason in just the same way if similarly placed. If, among her acquaintance, she found some one who was constantly thwarting her wishes, uttering sharp reprimands, and occasionally inflicting actual penalties on her, she would pay small attention to any professions of anxiety for her welfare which accompanied these acts. Why, then, does she suppose that her boy will do otherwise?

But now observe how different will be the results if the system we contend for be consistently pursued—if the mother not only avoids becoming the instrument of punishment, but plays the part of a friend, by warning her boy of the punishments which Nature will inflict. Take a case; and that it may illustrate the mode in which this policy is to be early initiated, let it be one of the simplest cases. Suppose that, prompted by the experimental spirit so conspicuous in children, whose proceedings instinctively conform to the inductive method of inquiry — suppose that so prompted, the boy is amusing himself by lighting pieces of paper in the candle and

watching them burn. A mother of the ordinary unreflective stamp, will either, on the plea of keeping him "out of mischief," or from fear that he will burn himself, command him to desist; and in case of non-compliance will snatch the paper from him. But, should he be fortunate enough to have a mother of some rationality, who knows that this interest with which he is watching the paper burn, results from a healthy inquisitiveness, and who has also the wisdom to consider the results of interference, she will reason thus:—"If I put a stop to this I shall prevent the acquirement of a certain amount of knowledge. It is true that I may save the child from a burn; but what then? He is sure to burn himself sometime; and it is quite essential to his safety in life that he should learn by experience the properties of flame. If I forbid him from running this present risk, he will certainly hereafter run the same or a greater risk when no one is present to prevent him; whereas, should he have an accident now that I am by, I can save him from any great injury. Moreover, were I to make him desist, I should thwart him in the pursuit of what is in itself a purely harmless, and indeed, instructive gratification; and he would regard me with more or less ill-feeling. Ignorant as he is of the pain from which I would save him, and feeling only the pain of a balked desire, he could not fail to look on me as the cause of that pain. To save him from a hurt which he cannot conceive, and which has therefore no existence for him, I hurt him in a way which he feels keenly enough; and so become, from his point of view, a minister of evil. My best course then, is simply to warn him of the danger, and to be ready to prevent any serious damage." And following out this conclusion, she says to the child—"I fear you will hurt yourself if you do that." Suppose, now, that the boy, persevering as he will probably do, ends by burning his hand. What are the results? In the first place he has gained an experience which he must gain eventually, and which, for his own safety, he cannot gain too soon. And in the second place, he has found that his mother's

disapproval or warning was meant for his welfare: he has a further positive experience of her benevolence—a further reason for placing confidence in her judgment and kindness—a further reason for loving her.

Of course, in those occasional hazards where there is a risk of broken limbs or other serious injury, forcible prevention is called for. But leaving out extreme cases, the system pursued should be, not that of guarding a child from the small risks which it daily runs, but that of advising and warning it against them. And by pursuing this course, a much stronger filial affection will be generated than commonly exists. If here, as elsewhere, the discipline of the natural reactions is allowed to come into play—if in those out-door scramblings and in-door experiments, by which children are liable to injure themselves, they are allowed to persist, subject only to dissuasion more or less earnest according to the danger, there cannot fail to arise an ever-increasing faith in the parental friendship and guidance. Not only, as before shown, does the adoption of this course enable fathers and mothers to avoid the odium which attaches to the infliction of positive punishment; but, as we here see, it enables them to avoid the odium which attaches to constant thwartings; and even to turn those incidents that commonly cause squabbles, into a means of strengthening the mutual good feeling. Instead of being told in words, which deeds seem to contradict, that their parents are their best friends, children will learn this truth by a consistent daily experience; and so learning it, will acquire a degree of trust and attachment which nothing else can give.

And now, having indicated the more sympathetic relation which must result from the habitual use of this method, let us return to the question above put—How is this method to be applied to the graver offences?

Note, in the first place, that these graver offences are likely to be both less frequent and less grave under the *régime* we have described than under the ordinary *régime*. The ill-be-

haviour of many children is itself a consequence of that chronic irritation in which they are kept by bad management. The state of isolation and antagonism produced by frequent punishment, necessarily deadens the sympathies; necessarily, therefore, opens the way to those transgressions which the sympathies check. That harsh treatment which children of the same family inflict on each other, is often, in great measure, a reflex of the harsh treatment they receive from adults—partly suggested by direct example, and partly generated by the ill-temper and the tendency to vicarious retaliation, which follow chastisements and scoldings. It cannot be questioned that the greater activity of the affections and happier state of feeling, maintained in children by the discipline we have described, must prevent them from sinning against each other so gravely and so frequently. The still more reprehensible offences, as lies and petty thefts, will, by the same causes, be diminished. Domestic estrangement is a fruitful source of such transgressions. It is a law of human nature, visible enough to all who observe, that those who are debarred the higher gratifications fall back upon the lower; those who have no sympathetic pleasures seek selfish ones; and hence, conversely, the maintenance of happier relations between parents and children is calculated to diminish the number of those offences of which selfishness is the origin.

When, however, such offences are committed, as they will occasionally be even under the best system, the discipline of consequences may still be resorted to; and if there exists that bond of confidence and affection above described, this discipline will be efficient. For what are the natural consequences, say, of a theft? They are of two kinds—direct and indirect. The direct consequence, as dictated by pure equity, is that of making restitution. A just ruler (and every parent should aim to be one) will demand that, when possible, a wrong act shall be undone by a right one; and in the case of theft this implies either the restoration of the thing stolen, or, if it is consumed, the giving of an equi-

valent: which, in the case of a child, may be effected out of its pocket-money. The indirect and more serious consequence is the grave displeasure of parents—a consequence which inevitably follows among all peoples civilized enough to regard theft as a crime. "But," it will be said, "the manifestation of parental displeasure, either in words or blows, is the ordinary course in these cases: the method leads here to nothing new." Very true. Already we have admitted that, in some directions, this method is spontaneously pursued. Already we have shown that there is a tendency for educational systems to gravitate towards the true system. And here we may remark, as before, that the intensity of this natural reaction will, in the beneficent order of things, adjust itself to the requirements—that this parental displeasure will vent itself in violent measures during comparatively barbarous times, when children are also comparatively barbarous; and will express itself less cruelly in those more advanced social states in which, by implication, the children are amenable to milder treatment. But what it chiefly concerns us here to observe is, that the manifestation of strong parental displeasure, produced by one of these graver offences, will be potent for good, just in proportion to the warmth of the attachment existing between parent and child. Just in proportion as the discipline of natural consequences has been consistently pursued in other cases, will it be efficient in this case. Proof is within the experience of all, if they will look for it.

For does not every one know that when he has offended another, the amount of regret he feels (of course, leaving worldly considerations out of the question) varies with the degree of sympathy he has for that other? Is he not conscious that when the person offended is an enemy, the having given him annoyance is apt to be a source rather of secret satisfaction than of sorrow? Does he not remember that where umbrage has been taken by some total stranger, he has felt much less concern than he would have done had

such umbrage been taken by one with whom he was intimate? While, conversely, has not the anger of an admired and cherished friend been regarded by him as a serious misfortune, long and keenly regretted? Well, the effects of parental displeasure on children must similarly vary with the pre-existing relationship. Where there is an established alienation, the feeling of a child who has transgressed is a purely selfish fear of the impending physical penalties or deprivations; and after these have been inflicted, the injurious antagonism and dislike which result, add to the alienation. On the contrary, where there exists a warm filial affection produced by a consistent parental friendship, the state of mind caused by parental displeasure is not only a salutary check to future misconduct of like kind, but is intrinsically salutary. The moral pain consequent on having, for the time being, lost so loved a friend, stands in place of the physical pain usually inflicted; and proves equally, if not more, efficient. While instead of the fear and vindictiveness excited by the one course, there are excited by the other a sympathy with parental sorrow, a genuine regret for having caused it, and a desire, by some atonement, to re-establish the friendly relationship. Instead of bringing into play those egotistic feelings whose predominance is the cause of criminal acts, there are brought into play those altruistic feelings which check criminal acts. Thus the discipline of natural consequences is applicable to grave as well as trivial faults; and the practice of it conduces not simply to the repression, but to the eradication of such faults.

In brief, the truth is that savageness begets savageness, and gentleness begets gentleness. Children who are unsympathetically treated become unsympathetic; whereas treating them with due fellow-feeling is a means of cultivating their fellow-feeling. With family governments as with political ones, a harsh despotism itself generates a great part of the crimes it has to repress; while on the other hand a mild and liberal rule both avoids many causes of dissension, and so

ameliorates the tone of feeling as to diminish the tendency to transgression. As John Locke long since remarked, "Great severity of punishment does but very little good, nay, great harm, in education; and I believe it will be found that, *cæteris paribus*, those children who have been most chastised seldom make the best men." In confirmation of which opinion we may cite the fact not long since made public by Mr. Rogers, Chaplain of the Pentonville Prison, that those juvenile criminals who have been whipped are those who most frequently return to prison. Conversely, the beneficial effects of a kinder treatment, are well illustrated in a fact stated to us by a French lady, in whose house we recently staid in Paris. Apologizing for the disturbance daily caused by a little boy who was unmanageable both at home and at school, she expressed her fear that there was no remedy save that which had succeeded in the case of an elder brother; namely, sending him to an English school. She explained that at various schools in Paris this elder brother had proved utterly untractable; that in despair they had followed the advice to send him to England; and that on his return home he was as good as he had before been bad. This remarkable change she ascribed entirely to the comparative mildness of the English discipline.

After the foregoing exposition of principles, our remaining space may best be occupied by a few of the chief maxims and rules deducible from them; and with a view to brevity we will put these in a hortatory form.

Do not expect from a child any great amount of moral goodness. During early years every civilized man passes through that phase of character exhibited by the barbarous race from which he is descended. As the child's features—flat nose, forward-opening nostrils, large lips, wide-apart eyes, absent frontal sinus, &c.—resemble for a time those of the savage, so, too, do his instincts. Hence the tendencies to cruelty, to thieving, to lying, so general among children—

tendencies which, even without the aid of discipline, will become more or less modified just as the features do. The popular idea that children are "innocent," while it is true with respect to evil *knowledge*, is totally false with respect to evil *impulses*; as half an hour's observation in the nursery will prove to any one. Boys when left to themselves, as at public schools, treat each other more brutally than men do; and were they left to themselves at an earlier age their brutality would be still more conspicuous.

Not only is it unwise to set up a high standard of good conduct for children, but it is even unwise to use very urgent incitements to good conduct. Already most people recognize the detrimental results of intellectual precocity; but there remains to be recognized the fact that *moral precocity* also has detrimental results. Our higher moral faculties, like our higher intellectual ones, are comparatively complex. By consequence, both are comparatively late in their evolution. And with the one as with the other, an early activity produced by stimulation will be at the expense of the future character. Hence the not uncommon anomaly that those who during childhood were models of juvenile goodness, by-and-by undergo a seemingly inexplicable change for the worse, and end by being not above but below par; while relatively exemplary men are often the issue of a childhood by no means promising.

Be content, therefore, with moderate measures and moderate results. Bear in mind that a higher morality, like a higher intelligence, must be reached by slow growth; and you will then have patience with those imperfections which your child hourly displays. You will be less prone to that constant scolding, and threatening, and forbidding, by which many parents induce a chronic domestic irritation, in the foolish hope that they will thus make their children what they should be.

This liberal form of domestic government, which does not seek despotically to regulate all the details of a child's con-

duct, necessarily results from the system we advocate. Satisfy yourself with seeing that your child always suffers the natural consequences of his actions, and you will avoid that excess of control in which so many parents err. Leave him wherever you can to the discipline of experience, and you will save him from that hot-house virtue which over-regulation produces in yielding natures, or that demoralizing antagonism which it produces in independent ones.

By aiming in all cases to insure the natural reactions to your child's actions, you will put an advantageous check on your own temper. The method of moral education pursued by many, we fear by most, parents, is little else than that of venting their anger in the way that first suggests itself. The slaps, and rough shakings, and sharp words, with which a mother commonly visits her offspring's small offences (many of them not offences considered intrinsically), are generally but the manifestations of her ill-controlled feelings—result much more from the promptings of those feelings than from a wish to benefit the offenders. But by pausing in each case of transgression to consider what is the normal consequence, and how it may best be brought home to the transgressor, some little time is obtained for the mastery of yourself; the mere blind anger first aroused settles down into a less vehement feeling, and one not so likely to mislead you.

Do not, however, seek to behave as a passionless instrument. Remember that besides the natural reactions to your child's actions which the working of things tends to bring round on him, your own approbation or disapprobation is also a natural reaction, and one of the ordained agencies for guiding him. The error we have been combating is that of *substituting* parental displeasure and its artificial penalties, for the penalties which Nature has established. But while it should not be *substituted* for these natural penalties, we by no means argue that it should not, in some form, *accompany* them. Though the *secondary* kind of punishment should not usurp the place of the *primary* kind; it may, in moderation, rightly

supplement the primary kind. Such amount of sorrow or indignation as you feel, should be expressed in words or manner; subject, of course, to the approval of your judgment. The kind and degree of feeling produced in you, will necessarily depend on your own character; and it is therefore useless to say it should be this or that. Nevertheless you may endeavour to modify the feeling into that which you believe ought to be entertained. Beware, however, of the two extremes; not only in respect of the intensity, but in respect of the duration, of your displeasure. On the one hand, avoid that weak impulsiveness, so general among mothers, which scolds and forgives almost in the same breath. On the other hand, do not unduly continue to show estrangement of feeling, lest you accustom your child to do without your friendship, and so lose your influence over him. The moral reactions called forth from you by your child's actions, you should as much as possible assimilate to those which you conceive would be called forth from a parent of perfect nature.

Be sparing of commands. Command only when other means are inapplicable, or have failed. "In frequent orders the parents' advantage is more considered than the child's," says Richter. As in primitive societies a breach of law is punished, not so much because it is intrinsically wrong as because it is a disregard of the king's authority—a rebellion against him; so in many families, the penalty visited on a transgressor is prompted less by reprobation of the offence than by anger at the disobedience. Listen to the ordinary speeches—"How *dare* you disobey me?" "I tell you I'll *make* you do it, sir." "I'll soon teach you who is *master*" —and then consider what the words, the tone, and the manner imply. A determination to subjugate is far more conspicuous in them, than anxiety for the child's welfare. For the time being the attitude of mind differs but little from that of a despot bent on punishing a recalcitrant subject. The right-feeling parent, however, like the philanthropic legislator, will rejoice not in coercion, but in dispensing with

coercion. He will do without law wherever other modes of regulating conduct can be successfully employed; and he will regret the having recourse to law when law is necessary. As Richter remarks—"The best rule in politics is said to be '*pas trop gouverner:*' it is also true in education." And in spontaneous conformity with this maxim, parents whose lust of dominion is restrained by a true sense of duty, will aim to make their children control themselves as much as possible, and will fall back upon absolutism only as a last resort.

But whenever you *do* command, command with decision and consistency. If the case is one which really cannot be otherwise dealt with, then issue your fiat, and having issued it, never afterwards swerve from it. Consider well what you are going to do; weigh all the consequences; think whether you have adequate firmness of purpose; and then, if you finally make the law, enforce obedience at whatever cost. Let your penalties be like the penalties inflicted by inanimate Nature—inevitable. The hot cinder burns a child the first time he seizes it; it burns him the second time; it burns him the third time; it burns him every time; and he very soon learns not to touch the hot cinder. If you are equally consistent—if the consequences which you tell your child will follow specified acts, follow with like uniformity, he will soon come to respect your laws as he does those of Nature. And this respect once established, will prevent endless domestic evils. Of errors in education one of the worst is inconsistency. As in a community, crimes multiply when there is no certain administration of justice; so in a family, an immense increase of transgressions results from a hesitating or irregular infliction of punishments. A weak mother, who perpetually threatens and rarely performs—who makes rules in haste and repents of them at leisure—who treats the same offence now with severity and now with leniency, as the passing humour dictates, is laying up miseries for herself and her children. She is making herself contemptible in their eyes; she is setting them an example of uncontrolled feelings; she is encouraging them to transgress

by the prospect of probable impunity; she is entailing endless squabbles and accompanying damage to her own temper and the tempers of her little ones; she is reducing their minds to a moral chaos, which after-years of bitter experience will with difficulty bring into order. Better even a barbarous form of domestic government carried out consistently, than a humane one inconsistently carried out. Again we say, avoid coercive measures whenever it is possible to do so; but when you find despotism really necessary, be despotic in good earnest.

Remember that the aim of your discipline should be to produce a *self-governing* being; not to produce a being to be *governed by others*. Were your children fated to pass their lives as slaves, you could not too much accustom them to slavery during their childhood; but as they are by-and-by to be free men, with no one to control their daily conduct, you cannot too much accustom them to self-control while they are still under your eye. This it is which makes the system of discipline by natural consequences, so especially appropriate to the social state which we in England have now reached. In feudal times, when one of the chief evils the citizen had to fear was the anger of his superiors, it was well that during childhood, parental vengeance should be a chief means of government. But now that the citizen has little to fear from any one—now that the good or evil which he experiences is mainly that which in the order of things results from his own conduct, he should from his first years begin to learn, experimentally, the good or evil consequences which naturally follow this or that conduct. Aim, therefore, to diminish the parental government, as fast as you can substitute for it in your child's mind that self-government arising from a foresight of results. During infancy a considerable amount of absolutism is necessary. A three-year old urchin playing with an open razor, cannot be allowed to learn by this discipline of consequences; for the consequences may be too serious. But as intelligence increases, the number of peremptory interferences may be, and should be, diminished,

with the view of gradually ending them as maturity is approached. All transitions are dangerous; and the most dangerous is the transition from the restraint of the family circle to the non-restraint of the world. Hence the importance of pursuing the policy we advocate; which, by cultivating a boy's faculty of self-restraint, by continually increasing the degree in which he is left to his self-restraint, and by so bringing him, step by step, to a state of unaided self-restraint, obliterates the ordinary sudden and hazardous change from externally-governed youth to internally-governed maturity. Let the history of your domestic rule typify, in little, the history of our political rule: at the outset, autocratic control, where control is really needful; by-and-by an incipient constitutionalism, in which the liberty of the subject gains some express recognition; successive extensions of this liberty of the subject; gradually ending in parental abdication.

Do not regret the display of considerable self-will on the part of your children. It is the correlative of that diminished coerciveness so conspicuous in modern education. The greater tendency to assert freedom of action on the one side, corresponds to the smaller tendency to tyrannize on the other. They both indicate an approach to the system of discipline we contend for, under which children will be more and more led to rule themselves by the experience of natural consequences; and they are both accompaniments of our more advanced social state. The independent English boy is the father of the independent English man; and you cannot have the last without the first. German teachers say that they had rather manage a dozen German boys than one English one. Shall we, therefore, wish that our boys had the manageableness of German ones, and with it the submissiveness and political serfdom of adult Germans? Or shall we not rather tolerate in our boys those feelings which make them free men, and modify our methods accordingly?

Lastly, always recollect that to educate rightly is not a simple and easy thing, but a complex and extremely difficult thing:

the hardest task which devolves on adult life. The rough and ready style of domestic government is indeed practicable by the meanest and most uncultivated intellects. Slaps and sharp words are penalties that suggest themselves alike to the least reclaimed barbarian and the stolidest peasant. Even brutes can use this method of discipline; as you may see in the growl and half-bite with which a bitch will check a too-exigeant puppy. But if you would carry out with success a rational and civilized system, you must be prepared for considerable mental exertion—for some study, some ingenuity, some patience, some self-control. You will have habitually to consider what are the results which in adult life follow certain kinds of acts; and you must then devise methods by which parallel results shall be entailed on the parallel acts of your children. It will daily be needful to analyze the motives of juvenile conduct—to distinguish between acts that are really good and those which, though simulating them, proceed from inferior impulses; while you will have to be ever on your guard against the cruel mistake not unfrequently made, of translating neutral acts into transgressions, or ascribing worse feelings than were entertained. You must more or less modify your method to suit the disposition of each child; and must be prepared to make further modifications as each child's disposition enters on a new phase. Your faith will often be taxed to maintain the requisite perseverance in a course which seems to produce little or no effect. Especially if you are dealing with children who have been wrongly treated, you must be prepared for a lengthened trial of patience before succeeding with better methods; since that which is not easy even where a right state of feeling has been established from the beginning, becomes doubly difficult when a wrong state of feeling has to be set right. Not only will you have constantly to analyze the motives of your children, but you will have to analyze your own motives—to discriminate between those internal suggestions springing from a true parental solicitude and those which spring from your own selfishness, your love

of ease, your lust of dominion. And then, more trying still, you will have not only to detect, but to curb these baser impulses. In brief, you will have to carry on your own higher education at the same time that you are educating your children. Intellectually you must cultivate to good purpose that most complex of subjects—human nature and its laws, as exhibited in your children, in yourself, and in the world. Morally, you must keep in constant exercise your higher feelings, and restrain your lower. It is a truth yet remaining to be recognized, that the last stage in the mental development of each man and woman is to be reached only through a proper discharge of the parental duties. And when this truth is recognized, it will be seen how admirable is the arrangement through which human beings are led by their strongest affections to subject themselves to a discipline that they would else elude.

While some will regard this conception of education as it should be, with doubt and discouragement, others will, we think, perceive in the exalted ideal which it involves, evidence of its truth. That it cannot be realized by the impulsive, the unsympathetic, and the short-sighted, but demands the higher attributes of human nature, they will see to be evidence of its fitness for the more advanced states of humanity. Though it calls for much labour and self-sacrifice, they will see that it promises an abundant return of happiness, immediate and remote. They will see that while in its injurious effects on both parent and child a bad system is twice cursed, a good system is twice blessed—it blesses him that trains and him that 's trained.

CHAPTER IV.

PHYSICAL EDUCATION.

Equally at the squire's table after the withdrawal of the ladies, at the farmers' market-ordinary, and at the village ale-house, the topic which, after the political question of the day, excites the most general interest, is the management of animals. Riding home from hunting, the conversation usually gravitates towards horse-breeding, and pedigrees, and comments on this or that 'good point;' while a day on the moors is very unlikely to end without something being said on the treatment of dogs. When crossing the fields together from church, the tenants of adjacent farms are apt to pass from criticisms on the sermon to criticisms on the weather, the crops, and the stock; and thence to slide into discussions on the various kinds of fodder and their feeding qualities. Hodge and Giles, after comparing notes over their respective pig-styes, show by their remarks that they have been observant of their masters' beasts and sheep; and of the effects produced on them by this or that kind of treatment. Nor is it only among the rural population that the regulations of the kennel, the stable, the cow-shed, and the sheep-pen, are favourite subjects. In towns, too, the numerous artizans who keep dogs, the young men who are rich enough to now and then indulge their sporting tendencies, and their more staid seniors who talk over agricultural progress or read Mr. Mechi's annual reports and Mr. Caird's letters to the *Times*, form, when added together, a large portion of the inhabitants. Take the adult males

throughout the kingdom, and a great majority will be found to show some interest in the breeding, rearing, or training of animals, of one kind or other.

But, during after-dinner conversations, or at other times of like intercourse, who hears anything said about the rearing of children? When the country gentleman has paid his daily visit to the stable, and personally inspected the condition and treatment of his horses; when he has glanced at his minor live stock, and given directions about them; how often does he go up to the nursery and examine into its dietary, its hours, its ventilation? On his library-shelves may be found White's *Farriery*, Stephens's *Book of the Farm*, Nimrod *on the Condition of Hunters;* and with the contents of these he is more or less familiar; but how many books has he read on the management of infancy and childhood? The fattening properties of oil-cake, the relative values of hay and chopped straw, the dangers of unlimited clover, are points on which every landlord, farmer, and peasant has some knowledge; but what percentage of them inquire whether the food they give their children is adapted to the constitutional needs of growing boys and girls? Perhaps the business-interests of these classes will be assigned as accounting for this anomaly. The explanation is inadequate, however; seeing that the same contrast holds among other classes. Of a score of townspeople, few, if any, would prove ignorant of the fact that it is undesirable to work a horse soon after it has eaten; and yet, of this same score, supposing them all to be fathers, probably not one would be found who had considered whether the time elapsing between his children's dinner and their resumption of lessons was sufficient. Indeed, on cross-examination, nearly every man would disclose the latent opinion that the regimen of the nursery was no concern of his. "Oh, I leave all those things to the women," would probably be the reply. And in most cases the tone of this reply would convey the implication, that such cares are not consistent with masculine dignity.

Regarded from any but a conventional point of view, the fact seems strange that while the raising of first-rate bullocks is an occupation on which educated men willingly bestow much time and thought, the bringing up of fine human beings is an occupation tacitly voted unworthy of their attention. Mammas who have been taught little but languages, music, and accomplishments, aided by nurses full of antiquated prejudices, are held competent regulators of the food, clothing, and exercise of children. Meanwhile the fathers read books and periodicals, attend agricultural meetings, try experiments, and engage in discussions, all with the view of discovering how to fatten prize pigs! We see infinite pains taken to produce a racer that shall win the Derby: none to produce a modern athlete. Had Gulliver narrated of the Laputans that the men vied with each other in learning how best to rear the offspring of other creatures, and were careless of learning how best to rear their own offspring, he would have paralleled any of the other absurdities he ascribes to them.

The matter is a serious one, however. Ludicrous as is the antithesis, the fact it expresses is not less disastrous. As remarks a suggestive writer, the first requisite to success in life is "to be a good animal;" and to be a nation of good animals is the first condition to national prosperity. Not only is it that the event of a war often turns on the strength and hardiness of soldiers; but it is that the contests of commerce are in part determined by the bodily endurance of producers. Thus far we have found no reason to fear trials of strength with other races in either of these fields. But there are not wanting signs that our powers will presently be taxed to the uttermost. The competition of modern life is so keen, that few can bear the required application without injury. Already thousands break down under the high pressure they are subject to. If this pressure continues to increase, as it seems likely to do, it will try severely even the soundest constitutions. Hence it is becoming of especial importance that the training of children should be so carried on, as not only

to fit them mentally for the struggle before them, but also to make them physically fit to bear its excessive wear and tear.

Happily the matter is beginning to attract attention. The writings of Mr Kingsley indicate a reaction against over-culture; carried perhaps, as reactions usually are, somewhat too far. Occasional letters and leaders in the newspapers have shown an awakening interest in physical training. And the formation of a school, significantly nicknamed that of "muscular Christianity," implies a growing opinion that our present methods of bringing up children do not sufficiently regard the welfare of the body. The topic is evidently ripe for discussion.

To conform the regimen of the nursery and the school to the established truths of modern science—this is the desideratum. It is time that the benefits which our sheep and oxen are deriving from the investigations of the laboratory, should be participated in by our children. Without calling in question the great importance of horse-training and pig-feeding, we would suggest that, as the rearing of well-grown men and women is also of some moment, these conclusions which theory indicates and practice indorses, ought to be acted on in the last case as in the first. Probably not a few will be startled—perhaps offended—by this collocation of ideas. But it is a fact not to be disputed, and to which we must reconcile ourselves, that man is subject to the same organic laws as inferior creatures. No anatomist, no physiologist, no chemist, will for a moment hesitate to assert, that the general principles which are true of the vital processes in animals are equally true of the vital processes in man. And a candid admission of this fact is not without its reward: namely, that the generalizations established by observation and experiment on brutes, become available for human guidance. Rudimentary as is the Science of Life, it has already attained to certain fundamental principles underlying the development of all organisms, the human included. That which has now to be done, and

that which we shall endeavour in some measure to do, is to trace the bearings of these fundamental principles on the physical training of childhood and youth.

The rhythmical tendency which is traceable in all departments of social life—which is illustrated in the access of despotism after revolution, or, among ourselves, in the alternation of reforming epochs and conservative epochs—which, after a dissolute age, brings an age of asceticism, and conversely,—which, in commerce, produces the recurring inflations and panics—which carries the devotees of fashion from one absurd extreme to the opposite one;—this rhythmical tendency affects also our table-habits, and by implication, the dietary of the young. After a period distinguished by hard drinking and hard eating, has come a period of comparative sobriety, which, in teetotalism and vegetarianism, exhibits extreme forms of protest against the riotous living of the past. And along with this change in the regimen of adults, has come a parallel change in the regimen for boys and girls. In past generations the belief was, that the more a child could be induced to eat, the better; and even now, among farmers and in remote districts, where traditional ideas most linger, parents may be found who tempt their children into repletion. But among the educated classes, who chiefly display this reaction towards abstemiousness, there may be seen a decided leaning to the under-feeding, rather than the over-feeding, of children. Indeed their disgust for by-gone animalism, is more clearly shown in the treatment of their offspring than in the treatment of themselves; for while their disguised asceticism is, in so far as their personal conduct is concerned, kept in check by their appetites, it has full play in legislating for juveniles.

That over-feeding and under-feeding are both bad, is a truism. Of the two, however, the last is the worst. As writes a high authority, "the effects of casual repletion are less prejudicial, and more easily corrected, than those of inanition."*

* *Cyclopædia of Practical Medicine.*

Besides, where there has been no injudicious interference, repletion seldom occurs. "Excess is the vice rather of adults than of the young, who are rarely either gourmands or epicures, unless through the fault of those who rear them." * This system of restriction which many parents think so necessary, is based upon inadequate observation, and erroneous reasoning. There is an over-legislation in the nursery, as well as an over-legislation in the State; and one of the most injurious forms of it is this limitation in the quantity of food.

"But are children to be allowed to surfeit themselves? Shall they be suffered to take their fill of dainties and make themselves ill, as they certainly will do?" As thus put, the question admits of but one reply. But as thus put, it assumes the point at issue. We contend that, as appetite is a good guide to all the lower creation—as it is a good guide to the infant—as it is a good guide to the invalid—as it is a good guide to the differently-placed races of men—and as it is a good guide for every adult who leads a healthful life; it may safely be inferred that it is a good guide for childhood. It would be strange indeed were it here alone untrustworthy.

Perhaps some will read this reply with impatience; being able, as they think, to cite facts totally at variance with it. It may appear absurd if we deny the relevancy of these facts. And yet the paradox is quite defensible. The truth is, that the instances of excess which such persons have in mind, are usually the *consequences* of the restrictive system they seem to justify. They are the sensual reactions caused by an ascetic regimen. They illustrate on a small scale that commonly-remarked truth, that those who during youth have been subject to the most rigorous discipline, are apt afterwards to rush into the wildest extravagances. They are analogous to those frightful phenomena, once not uncommon in convents, where nuns suddenly lapsed from the extremest austerities into an almost demoniac wickedness. They simply exhibit the uncontrollable vehemence of long-denied desires. Consider the

* *Cyclopædia of Practical Medicine.*

ordinary tastes and the ordinary treatment of children. The love of sweets is conspicuous and almost universal among them Probably ninety-nine people in a hundred presume that there is nothing more in this than gratification of the palate; and that, in common with other sensual desires, it should be discouraged. The physiologist, however, whose discoveries lead him to an ever-increasing reverence for the arrangements of things, suspects something more in this love of sweets than is currently supposed; and inquiry confirms the suspicion. He finds that sugar plays an important part in the vital processes. Both saccharine and fatty matters are eventually oxidized in the body; and there is an accompanying evolution of heat. Sugar is the form to which sundry other compounds have to be reduced before they are available as heat-making food; and this *formation* of sugar is carried on in the body. Not only is starch changed into sugar in the course of digestion, but it has been proved by M. Claude Bernard that the liver is a factory in which other constituents of food are transformed into sugar: the need for sugar being so imperative that it is even thus produced from nitrogenous substances when no others are given. Now, when to the fact that children have a marked desire for this valuable heat-food, we join the fa. ; that they have usually a marked dislike to that food which gives out the greatest amount of heat during oxidation (namely, fat), we have reason for thinking that excess of the one compensates for defect of the other—that the organism demands more sugar because it cannot deal with much fat. Again, children are fond of vegetable acids. Fruits of all kinds are their delight; and, in the absence of anything better, they will devour unripe gooseberries and the sourest of crabs. Now not only are vegetable acids, in common with mineral ones, very good tonics, and beneficial as such when taken in moderation; but they have, when administered in their natural forms, other advantages. "Ripe fruit," says Dr. Andrew Combe, "is more freely given on the Continent than in this country; and, particularly when the bowels act imperfectly,

it is often very useful." See, then, the discord between the instinctive wants of children and their habitual treatment. Here are two dominant desires, which in all probability express certain needs of the child's constitution; and not only are they ignored in the nursery-regimen, but there is a general tendency to forbid the gratification of them. Bread-and-milk in the morning, tea and bread-and-butter at night, or some dietary equally insipid, is rigidly adhered to; and any ministration to the palate is thought needless, or rather, wrong. What is the consequence? When, on fête-days, there is unlimited access to good things—when a gift of pocket-money brings the contents of the confectioner's window within reach, or when by some accident the free run of a fruit-garden is obtained; then the long-denied, and therefore intense, desires lead to great excesses. There is an impromptu carnival, due partly to release from past restraints, and partly to the consciousness that a long Lent will begin on the morrow. And then, when the evils of repletion display themselves, it is argued that children must not be left to the guidance of their appetites! These disastrous results of artificial restrictions, are themselves cited as proving the need for further restrictions! We contend, therefore, that the reasoning used to justify this system of interference is vicious. We contend that, were children allowed daily to partake of these more sapid edibles, for which there is a physiological requirement, they would rarely exceed, as they now mostly do when they have the opportunity: were fruit, as Dr. Combe recommends, "to constitute a part of the regular food" (given, as he advises, not between meals, but along with them), there would be none of that craving which prompts the devouring of crabs and sloes. And similarly in other cases.

Not only is it that the *à priori* reasons for trusting the appetites of children are strong; and that the reasons assigned for distrusting them are invalid; but it is that no other guidance is worthy of confidence. What is the value of this parental judgment, set up as an alternative regulator? When to

"Oliver asking for more," the mamma or governess says "No," on what data does she proceed? She *thinks* he has had enough. But where are her grounds for so thinking? Has she some secret understanding with the boy's stomach—some *clairvoyant* power enabling her to discern the needs of his body? If not, how can she safely decide? Does she not know that the demand of the system for food is determined by numerous and involved causes—varies with the temperature, with the hygrometric state of the air, with the electric state of the air—varies also according to the exercise taken, according to the kind and quantity of food eaten at the last meal, and according to the rapidity with which the last meal was digested? How can she calculate the result of such a combination of causes? As we heard said by the father of a five-years-old boy, who stands a head taller than most of his age, and is proportionately robust, rosy, and active:—"I can see no artificial standard by which to mete out his food. If I say, 'this much is enough,' it is a mere guess; and the guess is as likely to be wrong as right. Consequently, having no faith in guesses, I let him eat his fill." And certainly, any one judging of his policy by its effects, would be constrained to admit its wisdom. In truth, this confidence, with which most parents legislate for the stomachs of their children, proves their unacquaintance with physiology: if they knew more, they would be more modest. "The pride of science is humble when compared with the pride of ignorance." If any one would learn how little faith is to be placed in human judgments, and how much in the pre-established arrangements of things, let him compare the rashness of the inexperienced physician with the caution of the most advanced; or let him dip into Sir John Forbes's work, *On Nature and Art in the Cure of Disease;* and he will see that, in proportion as men gain knowledge of the laws of life, they come to have less confidence in themselves, and more in Nature.

Turning from the question of *quantity* of food to that of *quality*, we may discern the same ascetic tendency. Not

simply a restricted diet, but a comparatively low diet, is thought proper for children. The current opinion is, that they should have but little animal food. Among the less wealthy classes, economy seems to have dictated this opinion —the wish has been father to the thought. Parents not affording to buy much meat, answer the petitions of juveniles with—"Meat is not good for little boys and girls;" and this, at first probably nothing but a convenient excuse, has by repetition grown into an article of faith. While the classes with whom cost is no consideration, have been swayed partly by the example of the majority, partly by the influence of nurses drawn from the lower classes, and in some measure by the reaction against past animalism.

If, however, we inquire for the basis of this opinion, we find little or none. It is a dogma repeated and received without proof, like that which, for thousands of years, insisted on swaddling-clothes. Very probably for the infant's stomach, not yet endowed with much muscular power, meat, which requires considerable trituration before it can be made into chyme, is an unfit aliment. But this objection does not tell against animal food from which the fibrous part has been extracted; nor does it apply when, after the lapse of two or three years, considerable muscular vigour has been acquired. And while the evidence in support of this dogma, partially valid in the case of very young children, is not valid in the case of older children, who are, nevertheless, ordinarily treated in conformity with it, the adverse evidence is abundant and conclusive. The verdict of science is exactly opposite to the popular opinion. We have put the question to two of our leading physicians, and to several of the most distinguished physiologists, and they uniformly agree in the conclusion, that children should have a diet not *less* nutritive, but, if anything, *more* nutritive than that of adults.

The grounds for this conclusion are obvious, and the reasoning simple. It needs but to compare the vital processes of a man with those of a boy, to see that the demand

for sustenance is relatively greater in the boy than in the man. What are the ends for which a man requires food? Each day his body undergoes more or less wear—wear through muscular exertion, wear of the nervous system through mental actions, wear of the viscera in carrying on the functions of life; and the tissue thus wasted has to be renewed. Each day, too, by radiation, his body loses a large amount of heat; and as, for the continuance of the vital actions, the temperature of the body must be maintained, this loss has to be compensated by a constant production of heat: to which end certain constituents of the body are ever undergoing oxidation. To make up for the day's waste, and to supply fuel for the day's expenditure of heat, are, then, the sole purposes for which the adult requires food. Consider now, the case of the boy. He, too, wastes the substance of his body by action; and it needs but to note his restless activity to see that, in proportion to his bulk, he probably wastes as much as a man. He, too, loses heat by radiation; and, as his body exposes a greater surface in proportion to its mass than does that of a man, and therefore loses heat more rapidly, the quantity of heat-food he requires is, bulk for bulk, greater than that required by a man. So that even had the boy no other vital processes to carry on than the man has, he would need, relatively to his size, a somewhat larger supply of nutriment. But, besides repairing his body and maintaining its heat, the boy has to make new tissue—to grow. After waste and thermal loss have been provided for, such surplus of nutriment as remains, goes to the further building up of the frame; and only in virtue of this surplus is normal growth possible: the growth that sometimes takes place in the absence of it, causing a manifest prostration consequent upon defective repair. It is true that because of a certain mechanical law which cannot be here explained, a small organism has an advantage over a large one in the ratio between the sustaining and destroying forces—an advantage, indeed, to which the very possibility of

growth is owing. But this admission only makes it the more obvious that though much adverse treatment may be borne without this excess of vitality being quite out-balanced; yet any adverse treatment, by diminishing it, must diminish the size or structural perfection reached. How peremptory is the demand of the unfolding organism for materials, is seen alike in that "school-boy hunger," which after-life rarely parallels in intensity, and in the comparatively quick return of appetite. And if there needs further evidence of this extra necessity for nutriment, we have it in the fact that, during the famines following shipwrecks and other disasters, the children are the first to die.

This relatively greater need for nutriment being admitted, as it must be, the question that remains is—shall we meet it by giving an excessive quantity of what may be called dilute food, or a more moderate quantity of concentrated food? The nutriment obtainable from a given weight of meat is obtainable only from a larger weight of bread, or from a still larger weight of potatoes, and so on. To fulfil the requirement, the quantity must be increased as the nutritiveness is diminished. Shall we, then, respond to the extra wants of the growing child by giving an adequate quantity of food as good as that of adults? Or, regardless of the fact that its stomach has to dispose of a relatively larger quantity even of this good food, shall we further tax it by giving an inferior food in still greater quantity?

The answer is tolerably obvious. The more the labour of digestion is economized, the more energy is left for the purposes of growth and action. The functions of the stomach and intestines cannot be performed without a large supply of blood and nervous power; and in the comparative lassitude that follows a hearty meal, every adult has proof that this supply of blood and nervous power is at the expense of the system at large. If the requisite nutriment is obtained from a great quantity of innutritious food, more work is entailed on the viscera than when it is obtained from

a moderate quantity of nutritious food. This extra work is so much loss—a loss which in children shows itself either in diminished energy, or in smaller growth, or in both. The inference is, then, that they should have a diet which combines, as much as possible, nutritiveness and digestibility.

It is doubtless true that boys and girls may be reared upon an exclusively, or almost exclusively, vegetable diet. Among the upper classes are to be found children to whom comparatively little meat is given; and who, nevertheless, grow and appear in good health. Animal food is scarcely tasted by the offspring of labouring people; and yet they reach a healthy maturity. But these seemingly adverse facts have by no means the weight commonly supposed. In the first place, it does not follow that those who in early years flourish on bread and potatoes, will eventually reach a fine development; and a comparison between the agricultural labourers and the gentry, in England, or between the middle and lower classes in France, is by no means in favour of vegetable feeders. In the second place, the question is not simply a question of *bulk*, but also a question of *quality*. A soft, flabby flesh makes as good a show as a firm one; but though to the careless eye, a child of full, flaccid tissue may appear the equal of one whose fibres are well toned, a trial of strength will prove the difference. Obesity in adults is often a sign of feebleness. Men lose weight in training. Hence the appearance of these low-fed children is far from conclusive. In the third place, besides *size*, we have to consider *energy*. Between children of the meat-eating classes and those of the bread-and-potato-eating classes, there is a marked contrast in this respect. Both in mental and physical vivacity the peasant-boy is greatly inferior to the son of a gentleman.

If we compare different kinds of animals, or different races of men, or the same animals or men when differently fed, we

find still more distinct proof that *the degree of energy essentially depends on the nutritiveness of the food.*

In a cow, subsisting on so innutritive a food as grass, we see that the immense quantity required necessitates an enormous digestive system; that the limbs, small in comparison with the body, are burdened by its weight; that in carrying about this heavy body and digesting this excessive quantity of food, much force is expended; and that, having but little remaining, the creature is sluggish. Compare with the cow a horse —an animal of nearly allied structure, but habituated to a more concentrated diet. Here the body, and more especially its abdominal region, bears a smaller ratio to the limbs; the powers are not taxed by the support of such massive viscera, nor the digestion of so bulky a food; and, as a consequence, there is greater locomotive energy and considerable vivacity. If, again, we contrast the stolid inactivity of the graminivorous sheep with the liveliness of the dog, subsisting on flesh or farinaceous matters, or a mixture of the two, we see a difference similar in kind, but still greater in degree. And after walking through the Zoological Gardens, and noting the restlessness with which the carnivorous animals pace up and down their cages, it needs but to remember that none of the herbivorous animals habitually display this superfluous energy, to see how clear is the relation between concentration of food and degree of activity.

That these differences are not directly consequent on differences of constitution, as some may argue; but are directly consequent on differences in the food which the creatures are constituted to subsist on; is proved by the fact, that they are observable between different divisions of the same species. The varieties of the horse furnish an illustration. Compare the big-bellied, inactive, spiritless cart-horse with a racer or hunter, small in the flanks and full of energy; and then call to mind how much less nutritive is the diet of the one than that of the other. Or take the case of mankind. Australians,

Bushmen, and others of the lowest savages who live on roots and berries, varied by larvæ of insects and the like meagre fare, are comparatively puny in stature, have large abdomens, soft and undeveloped muscles, and are quite unable to cope with Europeans, either in a struggle or in prolonged exertion. Count up the wild races who are well grown, strong and active, as the Kaffirs, North-American Indians, and Patagonians, and you find them large consumers of flesh. The ill-fed Hindoo goes down before the Englishman fed on more nutritive food; to whom he is as inferior in mental as in physical energy. And generally, we think, the history of the world shows that the well-fed races have been the energetic and dominant races.

Still stronger, however, becomes the argument, when we find that the same individual animal is capable of more or less exertion according as its food is more or less nutritious. This has been demonstrated in the case of the horse. Though flesh may be gained by a grazing horse, strength is lost; as putting him to hard work proves. "The consequence of turning horses out to grass is relaxation of the muscular system." "Grass is a very good preparation for a bullock for Smithfield market, but a very bad one for a hunter." It was well known of old that, after passing the summer in the fields, hunters required some months of stable-feeding before becoming able to follow the hounds; and that they did not get into good condition till the beginning of the next spring. And the modern practice is that insisted on by Mr. Apperley—"Never to give a hunter what is called 'a summer's run at grass,' and, except under particular and very favourable circumstances, never to turn him out at all." That is to say, never give him poor food: great energy and endurance are to be obtained only by the continued use of nutritive food. So true is this that, as proved by Mr. Apperley, prolonged high-feeding enables a middling horse to equal, in his performances, a first-rate horse fed in the ordinary way. To which various evidences add the familiar fact that, when a horse is required to do double duty,

it is the practice to give him beans—a food containing a larger proportion of nitrogenous, or flesh-making material, than his habitual oats.

Once more, in the case of individual men the truth has been illustrated with equal, or still greater, clearness. We do not refer to men in training for feats of strength, whose regimen, however, thoroughly conforms to the doctrine. We refer to the experience of railway-contractors and their labourers. It has been for years a well-established fact that an English navvy, eating largely of flesh, is far more efficient than a Continental navvy living on farinaceous food: so much more efficient, that English contractors for Continental railways found it pay to take their labourers with them. That difference of diet and not difference of race caused this superiority, has been of late distinctly shown. For it has turned out, that when the Continental navvies live in the same style as their English competitors, they presently rise, more or less nearly, to a par with them in efficiency. And to this fact let us here add the converse one, to which we can give personal testimony based upon six months' experience of vegetarianism, that abstinence from meat entails diminished energy of both body and mind.

Do not these various evidences endorse our argument respecting the feeding of children? Do they not imply that, even supposing the same stature and bulk to be attained on an innutritive as on a nutritive diet, the quality of tissue is greatly inferior? Do they not establish the position that, where energy as well as growth has to be maintained, it can only be done by high feeding? Do they not confirm the *à priori* conclusion that, though a child of whom little is expected in the way of bodily or mental activity, may thrive tolerably well on farinaceous substances, a child who is daily required, not only to form the due amount of new tissue, but to supply the waste consequent on great muscular action, and the further waste consequent on hard exercise of brain, must live on substances containing a larger ratio of nutritive matter?

And is it not an obvious corollary, that denial of this better food will be at the expense either of growth, or of bodily activity, or of mental activity; as constitution and circumstances determine? We believe no logical intellect will question it. To think otherwise is to entertain in a disguised form the old fallacy of the perpetual-motion schemers—that it is possible to get power out of nothing.

Before leaving the question of food, a few words must be said on another requisite—*variety*. In this respect the dietary of the young is very faulty. If not, like our soldiers, condemned to "twenty years of boiled beef," our children have mostly to bear a monotony which, though less extreme and less lasting, is quite as clearly at variance with the laws of health. At dinner, it is true, they usually have food that is more or less mixed, and that is changed day by day. But week after week, month after month, year after year, comes the same breakfast of bread-and-milk, or, it may be, oatmeal-porridge. And with like persistence the day is closed, perhaps with a second edition of the bread-and-milk, perhaps with tea and bread-and-butter.

This practice is opposed to the dictates of physiology. The satiety produced by an often-repeated dish, and the gratification caused by one long a stranger to the palate, are *not* meaningless, as people carelessly assume; but they are the incentives to a wholesome diversity of diet. It is a fact, established by numerous experiments, that there is scarcely any one food, however good, which supplies in due proportions or right forms all the elements required for carrying on the vital processes in a normal manner: whence it follows that frequent change of food is desirable to balance the supplies of all the elements. It is a further fact, known to physiologists, that the enjoyment given by a much-liked food is a nervous stimulus, which, by increasing the action of the heart and so propelling the blood with increased vigour, aids in the subsequent digestion. And these truths are in harmony with

the maxims of modern cattle-feeding, which dictate a rotation of diet.

Not only, however, is periodic change of food very desirable; but, for the same reasons, it is very desirable that a mixture of food should be taken at each meal. The better balance of ingredients, and the greater nervous stimulation, are advantages which hold here as before. If facts are asked for, we may name as one, the comparative ease with which the stomach disposes of a French dinner, enormous in quantity but extremely varied in materials. Few will contend that an equal weight of one kind of food, however well cooked, could be digested with as much facility. If any desire further facts, they may find them in every modern book on the management of animals. Animals thrive best when each meal is made up of several things. The experiments of Goss and Stark "afford the most decisive proof of the advantage, or rather the necessity, of a mixture of substances, in order to produce the compound which is the best adapted for the action of the stomach." *

Should any object, as probably many will, that a rotating dietary for children, and one which also requires a mixture of food at each meal, would entail too much trouble; we reply, that no trouble is thought too great which conduces to the mental development of children, and that for their future welfare, good bodily development is of still higher importance. Moreover, it seems alike sad and strange that a trouble which is cheerfully taken in the fattening of pigs, should be thought too great in the rearing of children.

One more paragraph, with the view of warning those who may propose to adopt the regimen indicated. The change must not be made suddenly; for continued low-feeding so enfeebles the system, as to disable it from at once dealing with a high diet. Deficient nutrition is itself a cause of dyspepsia. This is true even of animals. "When calves are fed with

* *Cyclopædia of Anatomy and Physiology.*

skimmed milk, or whey, or other poor food, they are liable to indigestion."* Hence, therefore, where the energies are low, the transition to a generous diet must be gradual: each increment of strength gained, justifying a fresh addition of nutriment. Further, it should be borne in mind that the concentration of nutriment may be carried too far. A bulk sufficient to fill the stomach is one requisite of a proper meal; and this requisite negatives a diet deficient in those matters which give adequate mass. Though the size of the digestive organs is less in the well-fed civilized races than in the ill-fed savage ones; and though their size may eventually diminish still further; yet, for the time being, the bulk of the ingesta must be determined by the existing capacity. But, paying due regard to these two qualifications, our conclusions are—that the food of children should be highly nutritive; that it should be varied at each meal and at successive meals; and that it should be abundant.

With clothing as with food, the usual tendency is towards an improper scantiness. Here, too, asceticism peeps out. There is a current theory, vaguely entertained if not put into a definite formula, that the sensations are to be disregarded. They do not exist for our guidance, but to mislead us, seems to be the prevalent belief reduced to its naked form. It is a grave error: we are much more beneficently constituted. It is not obedience to the sensations, but disobedience to them, which is the habitual cause of bodily evils. It is not the eating when hungry, but the eating in the absence of hunger, which is bad. It is not drinking when thirsty, but continuing to drink when thirst has ceased, that is the vice. Harm does not result from breathing that fresh air which every healthy person enjoys; but from breathing foul air, spite of the protest of the lungs. Harm does not result from taking that active exercise which, as every child shows us, Nature strongly prompts; but from a persistent disregard of Nature's prompt-

* Morton's *Cyclopædia of Agriculture.*

ings. Not that mental activity which is spontaneous and enjoyable does the mischief; but that which is persevered in after a hot or aching head commands desistance. Not that bodily exertion which is pleasant or indifferent, does injury; but that which is continued when exhaustion forbids. It is true that, in those who have long led unhealthy lives, the sensations are not trustworthy guides. People who have for years been almost constantly in-doors, who have exercised their brains very much and their bodies scarcely at all, who in eating have obeyed their clocks without consulting their stomachs, may very likely be misled by their vitiated feelings. But their abnormal state is itself the result of transgressing their feelings. Had they from childhood never disobeyed what we may term the physical conscience, it would not have been seared, but would have remained a faithful monitor.

Among the sensations serving for our guidance are those of heat and cold; and a clothing for children which does not carefully consult these sensations, is to be condemned. The common notion about "hardening" is a grievous delusion. Not a few children are "hardened" out of the world; and those who survive, permanently suffer either in growth or constitution. "Their delicate appearance furnishes ample indication of the mischief thus produced, and their frequent attacks of illness might prove a warning even to unreflecting parents," says Dr. Combe. The reasoning on which this hardening theory rests is extremely superficial. Wealthy parents, seeing little peasant boys and girls playing about in the open air only half-clothed, and joining with this fact the general healthiness of labouring people, draw the unwarrantable conclusion that the healthiness is the result of the exposure, and resolve to keep their own offspring scantily covered! It is forgotten that these urchins who gambol upon village-greens are in many respects favourably circumstanced—that their lives are spent in almost perpetual play; that they are all day breathing fresh air; and that their systems are not disturbed by over-taxed brains. For aught

that appears to the contrary, their good health may be maintained, not in consequence of, but in spite of, their deficient clothing. This alternative conclusion we believe to be the true one; and that an inevitable detriment results from the loss of animal heat to which they are subject.

For when, the constitution being sound enough to bear it, exposure does produce hardness, it does so at the expense of growth. This truth is displayed alike in animals and in man. Shetland ponies bear greater inclemencies than the horses of the south, but are dwarfed. Highland sheep and cattle, living in a colder climate, are stunted in comparison with English breeds. In both the arctic and antarctic regions the human race falls much below its ordinary height: the Laplander and Esquimaux are very short; and the Terra del Fuegians, who go naked in a wintry land, are described by Darwin as so stunted and hideous, that "one can hardly make one's-self believe they are fellow-creatures."

Science explains this dwarfishness produced by great abstraction of heat; showing that, food and other things being equal, it unavoidably results. For, as before pointed out, to make up for that cooling by radiation which the body is ever undergoing, there must be a constant oxidation of certain matters forming part of the food. And in proportion as the thermal loss is great, must the quantity of these matters required for oxidation be great. But the power of the digestive organs is limited. Consequently, when they have to prepare a large quantity of this material needful for maintaining the temperature, they can prepare but a small quantity of the material which goes to build up the frame. Excessive expenditure for fuel entails diminished means for other purposes. Wherefore there necessarily results a body small in size, or inferior in texture, or both.

Hence the great importance of clothing. As Liebig says:— "Our clothing is, in reference to the temperature of the body, merely an equivalent for a certain amount of food." By diminishing the loss of heat, it diminishes the amount of

fuel needful for maintaining the heat; and when the stomach has less to do in preparing fuel, it can do more in preparing other materials. This deduction is confirmed by the experience of those who manage animals. Cold can be borne by animals only at an expense of fat, or muscle, or growth, as the case may be. "If fattening cattle are exposed to a low temperature, either their progress must be retarded, or a great additional expenditure of food incurred."* Mr. Apperley insists strongly that, to bring hunters into good condition, it is necessary that the stable should be kept warm. And among those who rear racers, it is an established doctrine that exposure is to be avoided.

The scientific truth thus illustrated by ethnology, and recognized by agriculturists and sportsmen, applies with double force to children. In proportion to their smallness and the rapidity of their growth is the injury from cold great. In France, new-born infants often die in winter from being carried to the office of the *maire* for registration. "M. Quetelet has pointed out, that in Belgium two infants die in January for one that dies in July." And in Russia the infant mortality is something enormous. Even when near maturity, the undeveloped frame is comparatively unable to bear exposure: as witness the quickness with which young soldiers succumb in a trying campaign. The *rationale* is obvious. We have already adverted to the fact that, in consequence of the varying relation between surface and bulk, a child loses a relatively larger amount of heat than an adult; and here we must point out that the disadvantage under which the child thus labours is very great. Lehmann says —"If the carbonic acid excreted by children or young animals is calculated for an equal bodily weight, it results that children produce nearly twice as much acid as adults." Now the quantity of carbonic acid given off varies with tolerable accuracy as the quantity of heat produced. And thus we see that in children the system, even when not

* Morton's *Cyclopædia of Agriculture*.

placed at a disadvantage, is called upon to provide nearly double the proportion of material for generating heat.

See, then, the extreme folly of clothing the young scantily. What father, full-grown though he is, losing heat less rapidly as he does, and having no physiological necessity but to supply the waste of each day—what father, we ask, would think it salutary to go about with bare legs, bare arms, and bare neck? Yet this tax on the system, from which he would shrink, he inflicts on his little ones, who are so much less able to bear it! or, if he does not inflict it, sees it inflicted without protest. Let him remember that every ounce of nutriment needlessly expended for the maintenance of temperature, is so much deducted from the nutriment going to build up the frame; and that even when colds, congestions, or other consequent disorders are escaped, diminished growth or less perfect structure is inevitable.

"The rule is, therefore, not to dress in an invariable way in all cases, but to put on clothing in kind and quantity *sufficient in the individual case to protect the body effectually from an abiding sensation of cold, however slight.*" This rule, the importance of which Dr. Combe indicates by the italics, is one in which men of science and practitioners agree. We have met with none competent to form a judgment on the matter, who do not strongly condemn the exposure of children's limbs. If there is one point above others in which "pestilent custom" should be ignored, it is this.

Lamentable, indeed, is it to see mothers seriously damaging the constitutions of their children out of compliance with an irrational fashion. It is bad enough that they should themselves conform to every folly which our Gallic neighbours please to initiate; but that they should clothe their children in any mountebank dress which *Le petit Courrier des Dames* indicates, regardless of its insufficiency and unfitness, is monstrous. Discomfort, more or less great, is inflicted; frequent disorders are entailed; growth is checked or stamina undermined; premature death not uncommonly caused; and all

because it is thought needful to make frocks of a size and material dictated by French caprice. Not only is it that for the sake of conformity, mothers thus punish and injure their little ones by scantiness of covering; but it is that from an allied motive they impose a style of dress which forbids healthful activity. To please the eye, colours and fabrics are chosen totally unfit to bear that rough usage which unrestrained play involves; and then to prevent damage the unrestrained play is interdicted. "Get up this moment: you will soil your clean frock," is the mandate issued to some urchin creeping about on the floor. "Come back: you will dirty your stockings," calls out the governess to one of her charges, who has left the footpath to scramble up a bank. Thus is the evil doubled. That they may come up to their mamma's standard of prettiness, and be admired by her visitors, children must have habiliments deficient in quantity and unfit in texture; and that these easily-damaged habiliments may be kept clean and uninjured, the restless activity so natural and needful for the young, is restrained. The exercise which becomes doubly requisite when the clothing is insufficient, is cut short, lest it should deface the clothing. Would that the terrible cruelty of this system could be seen by those who maintain it! We do not hesitate to say that, through enfeebled health, defective energies, and consequent non-success in life, thousands are annually doomed to unhappiness by this unscrupulous regard for appearances: even when they are not, by early death, literally sacrificed to the Moloch of maternal vanity. We are reluctant to counsel strong measures, but really the evils are so great as to justify, or even to demand, a peremptory interference on the part of fathers.

Our conclusions are, then—that, while the clothing of children should never be in such excess as to create oppressive warmth, it should always be sufficient to prevent any general feeling of cold;* that, instead of the flimsy cotton, linen, or

* It is needful to remark that children whose legs and arms have been from the beginning habitually without covering, cease to be conscious that the exposed

mixed fabrics commonly used, it should be made of some good non-conductor, such as coarse woollen cloth; that it should be so strong as to receive little damage from the hard wear and tear which childish sports will give it; and that its colours should be such as will not soon suffer from use and exposure.

To the importance of bodily exercise most people are in some degree awake. Perhaps less needs saying on this requisite of physical education than on most others: at any rate, in so far as boys are concerned. Public schools and private schools alike furnish tolerably adequate playgrounds; and there is usually a fair share of time for outdoor games, and a recognition of them as needful. In this, if in no other direction, it seems admitted that the promptings of boyish instinct may advantageously be followed; and, indeed, in the modern practice of breaking the prolonged morning's and afternoon's lessons by a few minutes' open-air recreation, we see an increasing tendency to conform school-regulations to the bodily sensations of the pupils. Here, then, little needs be said in the way of expostulation or suggestion.

But we have been obliged to qualify this admission by inserting the clause "in so far as boys are concerned." Unfortunately, the fact is quite otherwise with girls. It chances, somewhat strangely, that we have daily opportunity of drawing a comparison. We have both a boy's school and a girl's school within view; and the contrast between them is remarkable. In the one case, nearly the whole of a large garden is turned into an open, gravelled space, affording ample scope for games, and supplied with poles and horizontal bars for gymnastic exercises. Every day before breakfast, again towards eleven o'clock, again at mid-day, again in the afternoon,

surfaces are cold; just as by use we have all ceased to be conscious that our faces are cold, even when out of doors. But though in such children the sensations no longer protest, it does not follow that the system escapes injury; any more than it follows that the Fuegian is undamaged by exposure, because he bears with indifference the melting of the falling snow on his naked body.

and once more after school is over, the neighbourhood is awakened by a chorus of shouts and laughter as the boys rush out to play; and for as long as they remain, both eyes and ears give proof that they are absorbed in that enjoyable activity which makes the pulse bound and ensures the healthful activity of every organ. How unlike is the picture offered by the "Establishment for Young Ladies!" Until the fact was pointed out, we actually did not know that we had a girl's school as close to us as the school for boys. The garden, equally large with the other, affords no sign whatever of any provision for juvenile recreation; but is entirely laid out with prim grass-plots, gravel-walks, shrubs, and flowers, after the usual suburban style. During five months we have not once had our attention drawn to the premises by a shout or a laugh. Occasionally girls may be observed sauntering along the paths with their lesson-books in their hands, or else walking arm-in-arm. Once, indeed, we saw one chase another round the garden; but, with this exception, nothing like vigorous exertion has been visible.

Why this astonishing difference? Is it that the constitution of a girl differs so entirely from that of a boy as not to need these active exercises? Is it that a girl has none of the promptings to vociferous play by which boys are impelled? Or is it that, while in boys these promptings are to be regarded as stimuli to a bodily activity without which there cannot be adequate development, to their sisters, Nature has given them for no purpose whatever—unless it be for the vexation of school-mistresses? Perhaps, however, we mistake the aim of those who train the gentler sex. We have a vague suspicion that to produce a robust *physique* is thought undesirable; that rude health and abundant vigour are considered somewhat plebeian; that a certain delicacy, a strength not competent to more than a mile or two's walk, an appetite fastidious and easily satisfied, joined with that timidity which commonly accompanies feebleness, are held more lady-like. We do not expect that any would distinctly avow this; but we fancy the

governess-mind is haunted by an ideal young lady bearing not a little resemblance to this type. If so, it must be admitted that the established system is admirably calculated to realize this ideal. But to suppose that such is the ideal of the opposite sex is a profound mistake. That men are not commonly drawn towards masculine women, is doubtless true. That such relative weakness as asks the protection of superior strength, is an element of attraction, we quite admit. But the difference thus responded to by the feelings of men, is the natural, pre-established difference, which will assert itself without artificial appliances. And when, by artificial appliances, the degree of this difference is increased, it becomes an element of repulsion rather than of attraction.

"Then girls should be allowed to run wild—to become as rude as boys, and grow up into romps and hoydens!" exclaims some defender of the proprieties. This, we presume, is the ever-present dread of school-mistresses. It appears, on inquiry, that at "Establishments for Young Ladies" noisy play like that daily indulged in by boys, is a punishable offence; and we infer that it is forbidden, lest unlady-like habits should be formed. The fear is quite groundless, however. For if the sportive activity allowed to boys does not prevent them from growing up into gentlemen; why should a like sportive activity prevent girls from growing up into ladies? Rough as may have been their play-ground frolics, youths who have left school do not indulge in leap-frog in the street, or marbles in the drawing-room. Abandoning their jackets, they abandon at the same time boyish games; and display an anxiety—often a ludicrous anxiety—to avoid whatever is not manly. If now, on arriving at the due age, this feeling of masculine dignity puts so efficient a restraint on the sports of boyhood, will not the feeling of feminine modesty, gradually strengthening as maturity is approached, put an efficient restraint on the like sports of girlhood? Have not women even a greater regard for appearances than men? and will there not consequently arise in them even a stronger

check to whatever is rough or boisterous? How absurd is the supposition that the womanly instincts would not assert themselves but for the rigorous discipline of school-mistresses!

In this, as in other cases, to remedy the evils of one artificiality, another artificiality has been introduced. The natural, spontaneous exercise having been forbidden, and the bad consequences of no exercise having become conspicuous, there has been adopted a system of factitious exercise—gymnastics. That this is better than nothing we admit; but that it is an adequate substitute for play we deny. The defects are both positive and negative. In the first place, these formal, muscular motions, necessarily less varied than those accompanying juvenile sports, do not secure so equable a distribution of action to all parts of the body; whence it results that the exertion, falling on special parts, produces fatigue sooner than it would else have done: to which, in passing, let us add, that, if constantly repeated, this exertion of special parts leads to a disproportionate development. Again, the quantity of exercise thus taken will be deficient, not only in consequence of uneven distribution; but there will be a further deficiency in consequence of lack of interest. Even when not made repulsive, as they sometimes are, by assuming the shape of appointed lessons, these monotonous movements are sure to become wearisome from the absence of amusement. Competition, it is true, serves as a stimulus; but it is not a lasting stimulus, like that enjoyment which accompanies varied play. The weightiest objection, however, still remains. Besides being inferior in respect of the *quantity* of muscular exertion which they secure, gymnastics are still more inferior in respect of the *quality*. This comparative want of enjoyment which we have named as a cause of early desistance from artificial exercises, is also a cause of inferiority in the effects they produce on the system. The common assumption that, so long as the amount of bodily action is the same, it matters not whether it be pleasurable or otherwise, is a grave mistake. An agreeable mental excite-

ment has a highly invigorating influence. See the effect produced upon an invalid by good news, or by the visit of an old friend. Mark how careful medical men are to recommend lively society to debilitated patients. Remember how beneficial to health is the gratification produced by change of scene. The truth is that happiness is the most powerful of tonics. By accelerating the circulation of the blood, it facilitates the performance of every function; and so tends alike to increase health when it exists, and to restore it when it has been lost. Hence the intrinsic superiority of play to gymnastics. The extreme interest felt by children in their games, and the riotous glee with which they carry on their rougher frolics, are of as much importance as the accompanying exertion. And as not supplying these mental stimuli, gymnastics must be radically defective.

Granting then, as we do, that formal exercises of the limbs are better than nothing—granting, further, that they may be used with advantage as supplementary aids; we yet contend that they can never serve in place of the exercises prompted by Nature. For girls, as well as boys, the sportive activities to which the instincts impel, are essential to bodily welfare. Whoever forbids them, forbids the divinely-appointed means to physical development.

A topic still remains—one perhaps more urgently demanding consideration than any of the foregoing. It is asserted by not a few, that among the educated classes the younger adults and those who are verging on maturity, are neither so well grown nor so strong as their seniors. On first hearing this assertion, we were inclined to class it as one of the many manifestations of the old tendency to exalt the past at the expense of the present. Calling to mind the facts that, as measured by ancient armour, modern men are proved to be larger than ancient men; and that the tables of mortality show no diminution, but rather an increase, in the duration of life; we paid

little attention to what seemed a groundless belief. Detailed observation, however, has shaken our opinion. Omitting from the comparison the labouring classes, we have noticed a majority of cases in which the children do not reach the stature of their parents; and, in massiveness, making due allowance for difference of age, there seems a like inferiority. Medical men say that now-a-days people cannot bear nearly so much depletion as in times gone by. Premature baldness is far more common than it used to be. And an early decay of teeth occurs in the rising generation with startling frequency. In general vigour the contrast appears equally striking. Men of past generations, living riotously as they did, could bear more than men of the present generation, who live soberly, can bear. Though they drank hard, kept irregular hours, were regardless of fresh air, and thought little of cleanliness, our recent ancestors were capable of prolonged application without injury, even to a ripe old age: witness the annals of the bench and the bar. Yet we who think much about our bodily welfare; who eat with moderation, and do not drink to excess; who attend to ventilation, and use frequent ablutions; who make annual excursions, and have the benefit of greater medical knowledge; — we are continually breaking down under our work. Paying considerable attention to the laws of health, we seem to be weaker than our grandfathers who, in many respects, defied the laws of health. And, judging from the appearance and frequent ailments of the rising generation, they are likely to be even less robust than ourselves.

What is the meaning of this? Is it that past over-feeding, alike of adults and children, was less injurious than the underfeeding to which we have adverted as now so general? Is it that the deficient clothing which this delusive hardening-theory has encouraged, is to blame? Is it that the greater or less discouragement of juvenile sports, in deference to a false refinement, is the cause? From our reasonings it may be

inferred that each of these has probably had a share in producing the evil.* But there has been yet another detrimental influence at work, perhaps more potent than any of the others: we mean—excess of mental application.

On old and young, the pressure of modern life puts a still-increasing strain. In all businesses and professions, intenser competition taxes the energies and abilities of every adult; and, to fit the young to hold their places under this intenser competition, they are subject to severer discipline than heretofore. The damage is thus doubled. Fathers, who find themselves run hard by their multiplying competitors, and, while labouring under this disadvantage, have to maintain a more expensive style of living, are all the year round obliged to work early and late, taking little exercise and getting but short holidays. The constitutions shaken by this continued over-application, they bequeath to their children. And then these comparatively feeble children, predisposed to break down even under ordinary strains on their energies, are required to go through a *curriculum* much more extended than that prescribed for the unenfeebled children of past generations.

The disastrous consequences that might be anticipated, are everywhere visible. Go where you will, and before long there come under your notice cases of children or youths, of either sex, more or less injured by undue study. Here, to recover from a state of debility thus produced, a year's rustication has been found necessary. There you find a chronic congestion of the brain, that has already lasted many months, and

* We are not certain that the propagation of subdued forms of constitutional disease through the agency of vaccination is not a part-cause. Sundry facts in pathology suggest the inference, that when the system of a vaccinated child is excreting the vaccine virus by means of pustules, it will tend also to excrete through such pustules other morbific matters; especially if these morbific matters are of a kind ordinarily get rid of by the skin, as are some of the worst of them. Hence it is very possible—probable even—that a child with a constitutional taint, too slight to show itself in visible disease, may, through the medium of vitiated vaccine lymph taken from it, convey a like constitutional taint to other children, and these to others.

threatens to last much longer. Now you hear of a fever that resulted from the over-excitement in some way brought on at school. And again, the instance is that of a youth who has already had once to desist from his studies, and who, since his return to them, is frequently taken out of his class in a fainting fit. We state facts—facts not sought for, but which have been thrust on our observation during the last two years; and that, too, within a very limited range. Nor have we by any means exhausted the list. Quite recently we had the opportunity of marking how the evil becomes hereditary: the case being that of a lady of robust parentage, whose system was so injured by the *régime* of a Scotch boarding-school, where she was under-fed and over-worked, that she invariably suffers from vertigo on rising in the morning; and whose children, inheriting this enfeebled brain, are several of them unable to bear even a moderate amount of study without headache or giddiness. At the present time we have daily under our eyes, a young lady whose system has been damaged for life by the college-course through which she has passed. Taxed as she was to such an extent that she had no energy left for exercise, she is, now that she has finished her education, a constant complainant. Appetite small and very capricious, mostly refusing meat; extremities perpetually cold, even when the weather is warm; a feebleness which forbids anything but the slowest walking, and that only for a short time; palpitation on going up-stairs; greatly impaired vision—these, joined with checked growth and lax tissue, are among the results entailed. And to her case we may add that of her friend and fellow-student; who is similarly weak; who is liable to faint even under the excitement of a quiet party of friends; and who has at length been obliged by her medical attendant to desist from study entirely.

If injuries so conspicuous are thus frequent, how very general must be the smaller and inconspicuous injuries! To one case where positive illness is traceable to over-application, there are probably at least half-a-dozen cases where the evil

is unobtrusive and slowly accumulating—cases where there is frequent derangement of the functions, attributed to this or that special cause, or to constitutional delicacy; cases where there is retardation and premature arrest of bodily growth; cases where a latent tendency to consumption is brought out and established; cases where a predisposition is given to that now common cerebral disorder brought on by the labour of adult life. How commonly health is thus undermined, will be clear to all who, after noting the frequent ailments of hard-worked professional and mercantile men, will reflect on the much worse effects which undue application must produce on the undeveloped systems of children. The young can bear neither so much hardship, nor so much physical exertion, nor so much mental exertion, as the full grown. Judge, then, if the full grown manifestly suffer from the excessive mental exertion required of them, how great must be the damage which a mental exertion, often equally excessive, inflicts on the young!

Indeed, when we examine the merciless school drill frequently enforced, the wonder is, not that it does extreme injury, but that it can be borne at all. Take the instance given by Sir John Forbes, from personal knowledge; and which he asserts, after much inquiry, to be an average sample of the middle-class girl's-school system throughout England. Omitting detailed divisions of time, we quote the summary of the twenty-four hours.

In bed	9 hours	(the younger 10)
In school, at their studies and tasks . . .	9 „	
In school, or in the house, the elder at optional studies or work, the younger at play .	3½ „	(the younger 2½)
At meals	1½ „	
Exercise in the open air, in the shape of a formal walk, often with lesson-books in hand, and even this only when the weather is fine at the appointed time	1 „	
	24	

And what are the results of this "astounding regimen," as Sir John Forbes terms it? Of course feebleness, pallor, want of spirits, general ill-health. But he describes something more. This utter disregard of physical welfare, out of extreme anxiety to cultivate the mind—this prolonged exercise of brain and deficient exercise of limbs,—he found to be habitually followed, not only by disordered functions but by malformation. He says:—"We lately visited, in a large town, a boarding-school containing forty girls; and we learnt, on close and accurate inquiry, that there was *not one* of the girls who had been at the school two years (and the majority had been as long) that was not more or less *crooked!*" *

It may be that since 1833, when this was written, some improvement has taken place. We hope it has. But that the system is still common—nay, that it is in some cases carried to a greater extreme than ever; we can personally testify. We recently went over a training-college for young men: one of those instituted of late years for the purpose of supplying schools with well-disciplined teachers. Here, under official supervision, where something better than the judgment of private school-mistresses might have been looked for, we found the daily routine to be as follows:—

At 6 o'clock the students are called,
„ 7 to 8 studies,
„ 8 to 9 scripture-reading, prayers, and breakfast,
„ 9 to 12 studies,
„ 12 to 1¼ leisure, nominally devoted to walking or other exercise, but often spent in study,
„ 1¼ to 2 dinner, the meal commonly occupying twenty minutes,
„ 2 to 5 studies,
„ 5 to 6 tea and relaxation,
„ 6 to 8½ studies,
„ 8½ to 9½ private studies in preparing lessons for the next day,
„ 10 to bed.

Thus, out of the twenty-four hours, eight are devoted to sleep; four and a quarter are occupied in dressing, prayers,

* *Cyclopædia of Practical Medicine*, vol. i. pp. 697, 698.

meals, and the brief periods of rest accompanying them; ten and a half are given to study; and one and a quarter to exercise, which is optional and often avoided. Not only, however, are the ten-and-a-half hours of recognized study frequently increased to eleven-and-a-half by devoting to books the time set apart for exercise; but some of the students get up at four o'clock in the morning to prepare their lessons; and are actually encouraged by their teachers to do this! The course to be passed through in a given time is so extensive; and the teachers, whose credit is at stake in getting their pupils well through the examinations, are so urgent; that pupils are not uncommonly induced to spend twelve and thirteen hours a day in mental labour!

It needs no prophet to see that the bodily injury inflicted must be great. As we were told by one of the inmates, those who arrive with fresh complexions quickly become blanched. Illness is frequent: there are always some on the sick-list. Failure of appetite and indigestion are very common. Diarrhœa is a prevalent disorder: not uncommonly a third of the whole number of students suffering under it at the same time. Headache is generally complained of; and by some is borne almost daily for months. While a certain percentage break down entirely and go away.

That this should be the regimen of what is in some sort a model institution, established and superintended by the embodied enlightenment of the age, is a startling fact. That the severe examinations, joined with the short period assigned for preparation, should compel recourse to a system which inevitably undermines the health of all who pass through it, is proof, if not of cruelty, then of woful ignorance.

The case is no doubt in a great degree exceptional—perhaps to be paralleled only in other institutions of the same class. But that cases so extreme should exist at all, goes far to show that the minds of the rising generation are greatly over-tasked. Expressing as they do the ideas of the educated community, the requirements of these training colleges,

even in the absence of other evidence, would imply a prevailing tendency to an unduly urgent system of culture.

It seems strange that there should be so little consciousness of the dangers of over-education during youth, when there is so general a consciousness of the dangers of over-education during childhood. Most parents are partially aware of the evil consequences that follow infant-precocity. In every society may be heard reprobation of those who too early stimulate the minds of their little ones. And the dread of this early stimulation is great in proportion as there is adequate knowledge of the effects: witness the implied opinion of one of our most distinguished professors of physiology, who told us that he did not intend his little boy to learn any lessons until he was eight years old. But while to all it is a familiar truth that a forced development of intelligence in childhood, entails either physical feebleness, or ultimate stupidity, or early death; it appears not to be perceived that throughout youth the same truth holds. Yet it unquestionably does so. There is a given order in which, and a given rate at which, the faculties unfold. If the course of education conforms itself to that order and rate, well. If not—if the higher faculties are early taxed by presenting an order of knowledge more complex and abstract than can be readily assimilated; or if, by excess of culture, the intellect in general is developed to a degree beyond that which is natural to its age; the abnormal advantage gained will inevitably be accompanied by some equivalent, or more than equivalent, evil.

For Nature is a strict accountant; and if you demand of her in one direction more than she is prepared to lay out, she balances the account by making a deduction elsewhere. If you will let her follow her own course, taking care to supply, in right quantities and kinds, the raw materials of bodily and mental growth required at each age, she will eventually produce an individual more or less evenly developed. If, however, you insist on premature or undue growth of any

one part, she will, with more or less protest, concede the point; but that she may do your extra work, she must leave some of her more important work undone. Let it never be forgotten that the amount of vital energy which the body at any moment possesses, is limited; and that, being limited, it is impossible to get from it more than a fixed quantity of results. In a child or youth the demands upon this vital energy are various and urgent. As before pointed out, the waste consequent on the day's bodily exercise has to be met; the wear of brain entailed by the day's study has to be made good; a certain additional growth of body has to be provided for; and also a certain additional growth of brain: to which must be added the amount of energy absorbed in digesting the large quantity of food required for meeting these many demands. Now, that to divert an excess of energy into any one of these channels is to abstract it from the others, is both manifest *à priori*, and proved *à posteriori*, by the experience of every one. Every one knows, for instance, that the digestion of a heavy meal makes such a demand on the system as to produce lassitude of mind and body, frequently ending in sleep. Every one knows, too, that excess of bodily exercise diminishes the power of thought—that the temporary prostration following any sudden exertion, or the fatigue produced by a thirty miles' walk, is accompanied by a disinclination to mental effort; that, after a month's pedestrian tour, the mental inertia is such that some days are required to overcome it; and that in peasants who spend their lives in muscular labour the activity of mind is very small. Again, it is a familiar truth that during those fits of rapid growth which sometimes occur in childhood, the great abstraction of energy is shown in an attendant prostration, bodily and mental. Once more, the facts that violent muscular exertion after eating, will stop digestion; and that children who are early put to hard labour become stunted; similarly exhibit the antagonism—similarly imply that excess of activity in one direction involves deficiency of it in other directions. Now, the law which is thus

manifest in extreme cases, holds in all cases. These injurious abstractions of energy as certainly take place when the undue demands are slight and constant, as when they are great and sudden. Hence, if during youth the expenditure in mental labour exceeds that which Nature has provided for; the expenditure for other purposes falls below what it should have been; and evils of one kind or other are inevitably entailed. Let us briefly consider these evils.

Supposing the over-activity of brain to exceed the normal activity only in a moderate degree, there will be nothing more than some slight reaction on the development of the body: the stature falling a little below that which it would else have reached; or the bulk being less than it would have been; or the quality of tissue not being so good. One or more of these effects must necessarily occur. The extra quantity of blood supplied to the brain during mental exertion, and during the subsequent period in which the waste of cerebral substance is being made good, is blood that would else have been circulating through the limbs and viscera; and the growth or repair for which that blood would have supplied materials, is lost. This physical reaction being certain, the question is, whether the gain resulting from the extra culture is equivalent to the loss?—whether defect of bodily growth, or the want of that structural perfection which gives vigour and endurance, is compensated by the additional knowledge acquired?

When the excess of mental exertion is greater, there follow results far more serious; telling not only against bodily perfection, but against the perfection of the brain itself. It is a physiological law, first pointed out by M. Isidore St. Hilaire, and to which attention has been drawn by Mr. Lewes in his essay on *Dwarfs and Giants*, that there is an antagonism between *growth* and *development*. By growth, as used in this antithetical sense, is to be understood *increase of size*; by development, *increase of structure*. And the law is, that great activity in either of these processes involves retardation or

arrest of the other. A familiar example is furnished by the cases of the caterpillar and the chrysalis. In the caterpillar there is extremely rapid augmentation of bulk; but the structure is scarcely at all more complex when the caterpillar is full-grown than when it is small. In the chrysalis the bulk does not increase; on the contrary, weight is lost during this stage of the creature's life; but the elaboration of a more complex structure goes on with great activity. The antagonism, here so clear, is less traceable in higher creatures, because the two processes are carried on together. But we see it pretty well illustrated among ourselves when we contrast the sexes. A girl develops in body and mind rapidly, and ceases to grow comparatively early. A boy's bodily and mental development is slower, and his growth greater. At the age when the one is mature, finished, and having all faculties in full play, the other, whose vital energies have been more directed towards increase of size, is relatively incomplete in structure; and shows it in a comparative awkwardness, bodily and mental. Now this law is true of each separate part of the organism, as well as of the whole. The abnormally rapid advance of any organ in respect of structure, involves premature arrest of its growth; and this happens with the organ of the mind as certainly as with any other organ. The brain, which during early years is relatively large in mass but imperfect in structure, will, if required to perform its functions with undue activity, undergo a structural advance greater than is appropriate to its age; but the ultimate effect will be a falling short of the size and power that would else have been attained. And this is a part-cause—probably the chief cause—why precocious children, and youths who up to a certain time were carrying all before them, so often stop short and disappoint the high hopes of their parents.

But these results of over-education, disastrous as they are, are perhaps less disastrous than the effects produced on the health—the undermined constitution, the enfeebled energies, the morbid feelings. Recent discoveries in physiology have

shown how immense is the influence of the brain over the functions of the body. Digestion, circulation, and through these all other organic processes, are profoundly affected by cerebral excitement. Whoever has seen repeated, as we have, the experiment first performed by Weber, showing the consequence of irritating the *vagus* nerve, which connects the brain with the viscera—whoever has seen the action of the heart suddenly arrested by irritating this nerve; slowly recommencing when the irritation is suspended; and again arrested the moment it is renewed; will have a vivid conception of the depressing influence which an over-wrought brain exercises on the body. The effects thus physiologically explained, are indeed exemplified in ordinary experience. There is no one but has felt the palpitation accompanying hope, fear, anger, joy—no one but has observed how laboured becomes the action of the heart when these feelings are violent. And though there are many who have never suffered that extreme emotional excitement which is followed by arrest of the heart's action and fainting; yet every one knows these to be cause and effect. It is a familiar fact, too, that disturbance of the stomach results from mental excitement exceeding a certain intensity. Loss of appetite is a common consequence alike of very pleasurable and very painful states of mind. When the event producing a pleasurable or painful state of mind occurs shortly after a meal, it not unfrequently happens either that the stomach rejects what has been eaten, or digests it with great difficulty and under protest. And as every one who taxes his brain much can testify, even purely intellectual action will, when excessive, produce analogous effects. Now the relation between brain and body which is so manifest in these extreme cases, holds equally in ordinary, less-marked cases. Just as these violent but temporary cerebral excitements produce violent but temporary disturbances of the viscera; so do the less violent but chronic cerebral excitements produce less violent but chronic visceral disturbances. This is not simply an inference:—it is a truth to which every medical

man can bear witness; and it is one to which a long and sad experience enables us to give personal testimony. Various degrees and forms of bodily derangement, often taking years of enforced idleness to set partially right, result from this pro longed over-exertion of mind. Sometimes the heart is chiefly affected: habitual palpitations; a pulse much enfeebled; and very generally a diminution in the number of beats from seventy-two to sixty, or even fewer. Sometimes the conspicuous disorder is of the stomach: a dyspepsia which makes life a burden, and is amenable to no remedy but time. In many cases both heart and stomach are implicated. Mostly the sleep is short and broken. And very generally there is more or less mental depression.

Consider, then, how great must be the damage inflicted by undue mental excitement on children and youths. More or less of this constitutional disturbance will inevitably follow an exertion of brain beyond the normal amount; and when not so excessive as to produce absolute illness, is sure to entail a slowly accumulating degeneracy of *physique*. With a small and fastidious appetite, an imperfect digestion, and an enfeebled circulation, how can the developing body flourish? The due performance of every vital process depends on an adequate supply of good blood. Without enough good blood, no gland can secrete properly, no viscus can fully discharge its office. Without enough good blood, no nerve, muscle, membrane, or other tissue can be efficiently repaired. Without enough good blood, growth will neither be sound nor sufficient. Judge, then, how bad must be the consequences when to a growing body the weakened stomach supplies blood that is deficient in quantity and poor in quality; while the debilitated heart propels this poor and scanty blood with unnatural slowness.

And if, as all who investigate the matter must admit, physical degeneracy is a consequence of excessive study, how grave is the condemnation to be passed on this cramming-system above exemplified. It is a terrible mistake, from whatever point of view regarded. It is a mistake in so far as the

mere acquirement of knowledge is concerned. For the mind, like the body, cannot assimilate beyond a certain rate; and if you ply it with facts faster than it can assimilate them, they are soon rejected again: instead of being built into the intellectual fabric, they fall out of recollection after the passing of the examination for which they were got up. It is a mistake, too, because it tends to make study distasteful. Either through the painful associations produced by ceaseless mental toil, or through the abnormal state of brain it leaves behind, it often generates an aversion to books; and, instead of that subsequent self-culture induced by rational education, there comes continued retrogression. It is a mistake, also, inasmuch as it assumes that the acquisition of knowledge is everything; and forgets that a much more important thing is the organization of knowledge, for which time and spontaneous thinking are requisite. As Humboldt remarks respecting the progress of intelligence in general, that "the interpretation of Nature is obscured when the description languishes under too great an accumulation of insulated facts;" so, it may be remarked respecting the progress of individual intelligence, that the mind is over-burdened and hampered by an excess of ill-digested information. It is not the knowledge stored up as intellectual fat which is of value; but that which is turned into intellectual muscle. The mistake goes still deeper however. Even were the system good as producing intellectual efficiency, which it is not; it would still be bad, because, as we have shown, it is fatal to that vigour of *physique* needful to make intellectual training available in the struggle of life. Those who, in eagerness to cultivate their pupils' minds, are reckless of their bodies, do not remember that success in the world depends more on energy than on information; and that a policy which in cramming with information undermines energy, is self-defeating. The strong will and untiring activity due to abundant animal vigour, go far to compensate even great defects of education; and when joined with that quite adequate education which may be obtained

without sacrificing health, they ensure an easy victory over competitors enfeebled by excessive study: prodigies of learning though they may be. A comparatively small and ill-made engine, worked at high pressure, will do more than a large and well-finished one worked at low-pressure. What folly is it, then, while finishing the engine, so to damage the boiler that it will not generate steam! Once more, the system is a mistake, as involving a false estimate of welfare in life. Even supposing it were a means to worldly success, instead of a means to worldly failure, yet, in the entailed ill-health, it would inflict a more than equivalent curse. What boots it to have attained wealth, if the wealth is accompanied by ceaseless ailments? What is the worth of distinction, if it has brought hypochondria with it? Surely no one needs telling that a good digestion, a bounding pulse, and high spirits, are elements of happiness which no external advantages can outbalance. Chronic bodily disorder casts a gloom over the brightest prospects; while the vivacity of strong health gilds even misfortune. We contend, then, that this over-education is vicious in every way—vicious, as giving knowledge that will soon be forgotten; vicious, as producing a disgust for knowledge; vicious, as neglecting that organization of knowledge which is more important than its acquisition; vicious, as weakening or destroying that energy without which a trained intellect is useless; vicious, as entailing that ill-health for which even success would not compensate, and which makes failure doubly bitter.

On women the effects of this forcing system are, if possible, even more injurious than on men. Being in great measure debarred from those vigorous and enjoyable exercises of body by which boys mitigate the evils of excessive study, girls feel these evils in their full intensity. Hence, the much smaller proportion of them who grow up well-made and healthy. In the pale, angular, flat-chested young ladies, so abundant in London drawing-rooms, we see the effect of merciless application, unrelieved by youthful sports; and this physical degen-

eracy hinders their welfare far more than their many accomplishments aid it. Mammas anxious to make their daughters attractive, could scarcely choose a course more fatal than this, which sacrifices the body to the mind. Either they disregard the tastes of the opposite sex, or else their conception of those tastes is erroneous. Men care little for erudition in women; but very much for physical beauty, good nature, and sound sense. How many conquests does the blue-stocking make through her extensive knowledge of history? What man ever fell in love with a woman because she understood Italian? Where is the Edwin who was brought to Angelina's feet by her German? But rosy cheeks and laughing eyes are great attractions. A finely rounded figure draws admiring glances. The liveliness and good humour that overflowing health produces, go a great way towards establishing attachments. Every one knows cases where bodily perfections, in the absence of all other recommendations, have incited a passion that carried all before it; but scarcely any one can point to a case where intellectual acquirements, apart from moral or physical attributes, have aroused such a feeling. The truth is that, out of the many elements uniting in various proportions to produce in a man's breast the complex emotion we call love, the strongest are those produced by physical attractions; the next in order of strength are those produced by moral attractions; the weakest are those produced by intellectual attractions; and even these are dependent less on acquired knowledge than on natural faculty—quickness, wit, insight. If any think the assertion a derogatory one, and inveigh against the masculine character for being thus swayed; we reply that they little know what they say when they thus call in question the Divine ordinations. Even were there no obvious meaning in the arrangement, we might be sure that some important end was subserved. But the meaning is quite obvious to those who examine. When we remember that one of Nature's ends, or rather her supreme end, is the

welfare of posterity; further that, in so far as posterity are concerned, a cultivated intelligence based on a bad *physique* is of little worth, since its descendants will die out in a generation or two; and conversely that a good *physique*, however poor the accompanying mental endowments, is worth preserving, because, throughout future generations, the mental endowments may be indefinitely developed; we perceive how important is the balance of instincts above described. But, advantage apart, the instincts being thus balanced, it is folly to persist in a system which undermines a girl's constitution that it may overload her memory. Educate as highly as possible—the higher the better—providing no bodily injury is entailed (and we may remark, in passing, that a sufficiently high standard might be reached were the parrot-faculty cultivated less, and the human faculty more, and were the discipline extended over that now wasted period between leaving school and being married). But to educate in such manner, or to such extent, as to produce physical degeneracy, is to defeat the chief end for which the toil and cost and anxiety are submitted to. By subjecting their daughters to this high-pressure system, parents frequently ruin their prospects in life. Besides inflicting on them enfeebled health, with all its pains and disabilities and gloom; they not unfrequently doom them to celibacy.

The physical education of children is thus, in various ways, seriously faulty. It errs in deficient feeding; in deficient clothing; in deficient exercise (among girls at least); and in excessive mental application. Considering the *régime* as a whole, its tendency is too exacting: it asks too much and gives too little. In the extent to which it taxes the vital energies, it makes the juvenile life far more like the adult life than it should be. It overlooks the truth that, as in the fœtus the entire vitality is expended in growth—as in the infant, the expenditure of vitality in growth is so great as to leave extremely little for either

physical or mental action; so throughout childhood and youth, growth is the dominant requirement to which all others must be subordinated: a requirement which dictates the giving of much and the taking away of little—a requirement which, therefore, restricts the exertion of body and mind in proportion to the rapidity of growth—a requirement which permits the mental and physical activities to increase only as fast as the rate of growth diminishes.

The *rationale* of this high-pressure education is that it results from our passing phase of civilization. In primitive times, when aggression and defence were the leading social activities, bodily vigour with its accompanying courage were the desiderata; and then education was almost wholly physical: mental cultivation was little cared for, and indeed, as in feudal ages, was often treated with contempt. But now that our state is relatively peaceful—now that muscular power is of use for little else than manual labour, while social success of nearly every kind depends very much on mental power; our education has become almost exclusively mental. Instead of respecting the body and ignoring the mind, we now respect the mind and ignore the body. Both these attitudes are wrong. We do not yet realize the truth that as, in this life of ours, the physical underlies the mental, the mental must not be developed at the expense of the physical. The ancient and modern conceptions must be combined.

Perhaps nothing will so much hasten the time when body and mind will both be adequately cared for, as a diffusion of the belief that the preservation of health is a *duty*. Few seem conscious that there is such a thing as physical morality. Men's habitual words and acts imply the idea that they are at liberty to treat their bodies as they please. Disorders entailed by disobedience to Nature's dictates, they regard simply as grievances: not as the effects of a conduct more or less flagitious. Though the evil consequences inflicted on their dependents, and on future generations, are often as great as those caused by crime; yet they do not think themselves in

any degree criminal. It is true that, in the case of drunkenness, the viciousness of a bodily transgression is recognized; but none appear to infer that, if this bodily transgression is vicious, so too is every bodily transgression. The fact is, that all breaches of the laws of health are *physical sins*. When this is generally seen, then, and perhaps not till then, will the physical training of the young receive the attention it deserves.

THE END.

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