An oration on education : delivered before the Society for the Promotion of a Rational System of Education, and a numerous assembly of ladies and gentlemen, in St. John's Church, November 7th 1811 : by appointment of the Society : with annotations / by James Cutbush.

AN

ORATION

ON

EDUCATION,

DELIVERED BEFORE

THE SOCIETY FOR THE PROMOTION OF A RATIONAL SYSTEM OF EDUCATION,

AND A NUMEROUS ASSEMBLY OF LADIES AND GENTLEMEN,

IN ST. JOHN'S CHURCH, NOVEMBER 7th 1811.

BY APPOINTMENT OF THE SOCIETY.

WITH ANNOTATIONS.

BY JAMES CUTBUSH,

Vice President of the Society, Lecturer on Chemistry, Member of the Philadelphia Linnean and Agricultural Societies, Member of the Grand Lodge of Pennsylvania, &c.

The senses are the gifts of nature, and the primary regulators of our active powers. PRESTON.

Our ideas are acquired through the medium of the senses. LOCKE.

PHILADELPHIA:

PUBLISHED BY THE SOCIETY.

G. F. Goodman, Printer, 87, Callowhill street.

1812.

At a meeting of the "Society for the promotion of a rational system of Education," November 10th, 1811, the following resolution was adopted.

"RESOLVED that the thanks of this society be presented to DR. JAMES CUTBUSH for the excellent Oration on Education, delivered by him in St. John's Church, and that he be requested to favour the society with a copy for publication."

Extract from the Minutes.

JOHN BACHMAN, *Secretary.*

ORATION ON EDUCATION.

GENTLEMEN OF THE SOCIETY FOR THE PROMOTION OF A RATIONAL SYSTEM OF EDUCATION.

AGREEABLY to the duties of the appointment, I have had the honour to receive from you, permit me to call your attention to a subject, which has already awakened the liveliest feelings of the heart, namely, EDUCATION.

In order the better to illustrate this inquiry, in its most extensive sense, it may not be improper in the first place, to examine the principles of associations in general; secondly, treat of education, from the elementary to the more refined branches of learning; and thirdly, conclude with some moral reflections, naturally resulting from so useful and comprehensive a theme.

First. Of Man in society.

At the summit of the scale of our globe is placed man, the master-piece of earthly creation. In modern times, it has become fashionable for philosophers, of a particular sect, to speak of mankind, as having originally been a race of savages, little removed from brutes, and wholly unconnected with one another in society.

In such a state, which is contrary to fact, every man must have been his own law giver, his own judge, his own protector, his own avenger. Although man may have so far degenerated as to have approximated to this state, yet, considering the constitution of human nature, he never could subsist. The social principle is as much interwoven with our nature, as the principle of self-preservation. No human creature could long continue in the exercise of his rational faculties, without desiring society, and using means to obtain it, if such means were in his power.

The law of nature, that was originally written on the heart of man, and still continues to be so, expressly requires social and relative duties; and expressly prohibits crimes against society. This necessarily presupposes a social state.

If we have recourse to the holy writings, we find, that the moment EVE was created, social and other duties were formed; consequently, society was constituted. The happiness of mankind, the means by which it is promoted, the physical constitution of human nature, the influence of education, and several other subjects will claim our attention in their proper places.

There are two enquiries, however, which may be considered in this place, namely, man as a social being, and man in communion with GOD by religion.

In whatever light we view associations, it may be said, that the principle on which they are erected is implanted in our nature by the author and dispenser of all good; and is calculated to produce the same beneficial end in the moral, that the power of attraction does in the natural world.*

This propensity to associate, may be observed in every stage of society; from the rude hunter of the forest, to the polished inhabitant of the city; from the first elements of simple societies, to the more complicated and expanded associations. Whether it is an instinct or a habit; whether it is the dictate of powerful unerring nature, operating for the benefit of the subject, or the the result of prudence and reason, consulting individual as well as general good, it is not necessary to investigate. We feel and we know, that it predominates over our species; that it operates with the power of both these causes; and that, whether it exhibits itself in families, in literary or benevolent institutions, or in nations, its spirit is good and its object benificent.

The absence of this principle in men, or in other creatures, is generally attended with ferocious and sanguinary propensities; and wherever it prevails, we find our nature improved, our felicities increased, and the general condition of society ameliorated. The gloomy anchorite, the unfeeling fanatic, and the repulsive misanthropist, always inshroud themselves in solitude, and seek in vain for that happiness, which they failed of obtaining in the busy theatre of the world.

Independent of these associations, which may be denominated natural, we observe voluntary societies springing up in a thousand shapes, for the improvement of our physical, mental, or moral faculties.

In the whole order of beings, from the seraph down to the meanest insect, all, according to their rank in the scale of existence, have, more or less implanted in them, the principle of association with others of the same species. Even the most inconsiderable animals are formed into different ranks and societies, for mutual benefit and protection. Need we name the careful ant, or the industrious bee; insects, which the wisest of men have recommended as patterns of unwearied industry and prudent foresight. But, does the innate principle of friendship, increase in

* See the R. W. De Witt Clinton's Masonic Address, 1806.

proportion to the extension of our intellectual faculties? This is a consideration of great magnitude. The cements of the rational world are unbounded. When they cease, nature must be dissolved, and man, the image of his CREATOR and the chief of his works, be overwhelmed in the general chaos!

Civilization undoubtedly depends upon an innate principle; and the social duties, which have existed from the days of ADAM, are interwoven with our existence. The *condition* of society, however, has been ameliorated from the knowledge of the arts and sciences. The learned Dr. PRICE is of opinion, that a time will come when mankind shall arrive at the summit of all possible perfection, from the extension of our intellectual faculties. He even goes so far as to add, that science will eventually suppress vice and war, and even death itself! The pious Bishop of LANDAFF, however, is of opinion, that human nature can never arrive at this degree of perfection, nor do we think it possible, considering the physical constitution of man. Though from our weakness we may gather strength, and from our wants gather plenty, yet we, worms of the dust! insects of an hour! can never penetrate the *secret* recesses of nature, and *stop* the laws of creative power.

While we look up to the CAUSE of all causes....while we contemplate creation, and observe her symmetry and beauty....while we raise ourselves up to ETERNAL REASON and study HIS laws.... while we have *faith*, *hope*, and *charity* to lead us in the paths of happiness....while we are animated with heartfelt gratitude for all the blessings, both spiritual and temporal, which we enjoy, we may erect our edifice, not on the sands, but on the rock of ages, which the mouldering hand of time can not destroy.

In society, the principles of honesty, truth, benevolence, charity, and justice, should ever be practised and inculcated. No social compact can be honourable, happy and durable, without a compliance with these requisites. These principles should be impressed on the minds of youth.

The many advantages resulting from FRIENDSHIP, whether we trace it through the circle of private connexions, to the grand system of universal benevolence, which no limits can circumscribe, or consider it as a necessary duty, may be compared to a wheel of immense magnitude, whose revolutions mark the rise progress, and usefulness of a reciprocal intercourse of kind and generous actions. As the mercurial column shows the *increase* and *decrease* of temperature, so the social affections either *rise* or *fall* in the ratio of mutual friendship. Where friendship is unknown, jealousy and suspicion prevail; but where that virtue is the cement, true happiness subsists. PATRIOTISM, or love of country, is a species of friendship for the land in which we live, for the political and social compact, for the laws: in fine, for the country, its laws, its rulers. The warrior's glory may consist in murder, and the rude ravage of the desolating sword; but the blood of thousands will not stain the hands of his country's friend. His virtues are open, and of the noblest kind.

It is true, that "the better men are, the more they love one another," of course, the more durable would be the friendship, and of a purer kind; *i. e.* the mind would be divested of hypocricy and deceit. "*The skylle of becommynge gude and parfyghte*," says king Henry, the sixth, in an original manuscript,* we may add is but little known; and if it is, it is but little practised.

It may be said, that the excellence of human reason shines with a new lustre, from the establishment of SOCIETIES, or *bodies politic*. In them, virtue, honour, fear, and interest, variously employed or combined, prove the source of peace, happiness and order. All the individuals, being mutually interwoven together, move in a regular and harmonious manner. Under the sanction of the laws, the president, governor or magistrate, by exercising a lawful authority, promotes virtue, suppresses vice, and spreads around him the happiest instances and effects of his administration.

In society, as in a pure and fertile climate, talents of different kinds spring up, and unfold themselves. From that the mechanical and liberal arts flourish. From thence are born poets, orators, historians, physicians, divines, philosophers, lawyers.

It is a truth, however, that in whatever state man is placed, provided his mind has been formed by a proper education, he feels a desire to acquire knowlege; and, very frequently, science may be seen enlightening and consoling him.

Man, considered as an intelligent creature, is endowed with reason, judgment, volition, which constitutes him a being of the first order. He alone, of all other creatures, enjoys the gift of speech. Sometimes with a strong and harmonious voice, he celebrates, in a poem, the virtues of a hero. At other times, by the stroke of a pencil, he changes a dull and ungrateful canvass into a charming perspective. Here do we see him, with the chissel and graver in his hand, animating the marble, and giving life to brass. There, with the plummet and square, erecting a magnificent palace. Now do we behold him, by the assistance of a microscope of his own invention, discovering new worlds amid invisible atoms, or penetrating the secret exercise and motion of a particular organ. At other times, by changing this microscope as it were into a telescope, he pierces into the heavens, and there contemplates saturn and his satellites. Returning home, he prescribes or rather determines the laws of the celestial bodies, describes their orbits, measures the earth, and weighs the sun! Afterwards directing his flight towards the more exalted regions of metaphysics, he dives into the nature of beings, examines their relations, and the admirable harmony resulting from them.†

Although amid these physical and metaphysical contemplations, man is a dependant being. To GOD, he owes his admirable faculties; to GOD, he owes his existence, his every thing!

* M. S. in the Bodlein library. † See note 9.

"*Man is sown corruptible; he will rise incorruptible and glorious*"; these are the words of the apostle and philosopher. The covering of the seed perishes; the germ subsists, and assures man of immortality.

The last mark of the greatness of man, and of his high exaltation above other animals, is the *commerce* he has with his CREATOR, by religion.

Wrapped in the thickest darkness, the rest of the animal creation are ignorant of the HAND that formed them. They enjoy an existence, but can not trace the author of life. Though the beaver may be considered an architect, and the bee a geometrician, yet, they possess only *sensitive* and *vegetative* life. But man, a *reflective* being, is exalted above other animals. His rank is as far above the ape, as the ape transcends the smallest animalculæ! The human mind combines and perfects without ceasing; that of other animals, neither perfects nor combines. Man alone soars to GOD the PRINCIPLE; and, prostrate at the footstool of his almighty throne, he adores with the proudest sentiments of veneration, and with the most lively gratitude, the INEFFABLE GOODNESS that created him.

In consequence of those eminent faculties wherewith he is enriched, GOD condescends to reveal himself to him, and to lead him as it were by the hand, in the paths of happiness. The various laws he has received from the SUPREME WISDOM, are so many great lights placed at proper distances on his road, to guide him from time to eternity.

The sensorium of man may be considered as a *mirror*, in which different portions of the universe is painted in miniature, and which are *reflected* when the senses are brought into action. If we compare the intellect of men, the mind will appear as diversified as any other subject of nature. If we draw comparisons between human beings, and infer that some are endowed with more powerful faculties than others; will not, I would ask, a perfect method of education so balance the scale, as to give industry and application the superiority over natural genius? If we go still further, and from analogy conclude, that some of these mirrors exhibit but a small number of objects, while others comprehend a more extensive field, are we to consider this difference as a *diversity* in human genius, or the *effect* of education? What is the relation between the mirror of a mole, or that of a NEWTON, a LUTHER, or a MELANCTHON! What images were there in the brain of a HOMER, a VIRGIL, or a MILTON! That mind which could have read the brain of a HOMER, would have there seen the Iliad represented by the various exercise of a million of fibres!*

Secondly. Of EDUCATION.

Having thus shown, that man alone is endowed with understanding, and that his usefulness and happiness depend on the

* See note 17.

cultivation of his rational faculties, we now proceeed to consider education, or the means by which it is promoted.

The state of society and of government with us, is admirably calculated to countenance and encourage learning in every shape.

Education is the art of forming and managing the mind. If the benefits are so extensive and widely diffused, affecting the rich as well as the poor, surely it is a duty we owe society to perfect the art, and to establish a system on the immutable laws of nature. Of how much importance, therefore, are those institutions, which are formed to promote a rational method of education?

As a preliminary step to any system, the principle of association should be forcibly impressed on the minds of youth. SHERIDON has expressly said, that in order to render education adequate to its purpose, it must be a fundamental maxim, that it should be particularly adapted to the nature of the government.... and that the principles by which the community is supported, should be strongly inculcated on the minds of youth; for, says he, the best education can never produce citizens, who will adhere to the maxims of a free constitution, unless they are constantly reminded of the origin of the social compact.

Whether we contemplate education in this light, or whether we go into an abstruse or complicated analysis of the mind, or whether we trace the progress of the intellect expanding at every new sensation, our inference in this respect must be conclusive.

The importance of education, and the establishment of this institution, is thus portrayed in the preliminary to the constitution of the society: "The education of youth in useful knowledge, ought to be a primary object with parents and guardians. But more especially ought every endeavour to be used in a religious community, to lay a sure and solid foundation for every moral and social virtue. Impressed with a conviction of this important truth, a number of the members of St. JOHN's congregation, willing to give every aid within their power, towards the establishment and support of a rational system of eduaction, have formed themselves into a society for that purpose."

The institution is liberal, and calculated to produce considerable advantages.*

Learning, in truth, is progressing with such rapid steps, in this section of the northern hemisphere, which but little more than a century back was a barren clime, that we behold UNIVERSITIES, COLLEGES, SEMINARIES, springing up in every quarter of the United States, and diffusing their salutary influence on the genius and disposition of the people. Even in our city the number of FREE SCHOOLS, instituted by the benevolence and philanthropy shall I say of heaven-born characters, are numerous, and have already ameliorated the condition of the poor. While a benevolent

* See note 19.

HOWARD graces the page of English biography, may such be enrolled on the record of American worthies!

Among the prominent characters who contributed to the support of charity schools, I would do an injustice to my feelings were I to omit the name of Mr. CHRISTOPHER LUDWICK, an old and respectable German. He granted with a liberal hand, the sum of ten thousand dollars, for the purpose of teaching gratis, the poor of ALL denominations in the city of Philadelphia, the districts of Southwark and Northern Liberties, without respect to their country or religion.*

It were to be wished, that our ideas on education were founded more on the nature of the mind, and the various relations which it maintains through the medium of the senses. Doubtless the reason of this lies not so much in the want of tenderness and affection, as the Rev. Dr. ZOLLIKOFFER† so justly observes, as in wrong and incompetent notions generally entertained of education. That is, this duty is but too often confided to the care of providing for the life and health of the children; of teaching them some mechanical works and arts; loading their memory with a multitude of words which they do not understand; instructing them in the rules of external propriety of behaviour and politeness; warning them of the grosser enormities, which are followed by punishment and disgrace; divesting them of their natural simplicity and openness of heart, and instilling into them the arts of reserve, dissimulation, and flattery. Such, indeed, are the ideas of education which *many* entertain; and such, in truth, has been the fatality of many systems of education, from incorrect opinions respecting the nature and properties of the sensorium. Education, instead of being what it should be, to *form* the understanding, or the *minds* of children, by producing certain impressions on the sensorium through the medium of the senses, from one degree of perfection to another; has generally been a system of erroneous notions, incorrect impulses, external show, and too often, of vanity and folly. How many instances, it may be asked, may we expect to find, in which a system has been carried into effect, so enlightened, unremitted, and ardent, as to produce the advantages of which we have spoken?

Education, it is to be remembered, has the advantage of taking the mind in its original state; a soil prepared for culture and improvement, and as yet uninfested with weeds. The difficulties of a solid education may be compared to a kind of preliminary course, intended perhaps by providence as a gradual preparative for the subsequent difficulties in life. While reason exercises the intellect, and fortifies the understanding; the mind, however powerful, and however improved, must be so counterpoised, as to render mental discipline subservient to moral.

* See note 14. † ZOLLIKOFFER's Sermons

In animals, temper governs all. In man, reason regulates the temper; and temper when under due regulations, facilitates, in its turn, the execrcise of reason.

Learn then the temper; if it be vicious, you are to correct it, by skilfully diverting its course, and by carefully avoiding every thing that may contribute to add new strength to it, and swell the waters of such a dangerous torrent.

How applicable are the words of POPE, "The proper study of mankind is man." Numerous are the writings, and diversified are the opinions, on the *nature* and *physical constitution* of man.

In noticing this subject, it may not be improper to observe, that mankind are under a thousand obligations to the immortal LUTHER. That world would be unjust, were it to take from him a single laurel from the crown, which he gathered not for himself indeed, but for the one family universal! He penetrated the arcana of nature! He, animated with benevolent and philanthropic fire, not only soared to the sublime truths of metaphysics and religion; but on more than one occasion portrayed in brilliant colours, the unbounded influence of mental and moral improvement! To him, the world is indebted for principles and precepts! To him, who drew with his pencil, the picture of his DIVINE MASTER, though in miniature, education alike owes its progressive improvement! Perhaps I hear some one say, where is your proof? I answer with justice to my feelings, unfold his voluminons writings, aud you will have incontrovertible testimony. He was, indeed, an interpreter of Nature, and of NATURE'S GOD! He was preeminent in every thing, which affected, in any manner, the happiness and *well-being* of fellow man. Incarnate word, first born of creatures, if it were possible to transfer this heavenly power, it was in the mind of LUTHER that it shone resplendent!

Nor is the great MELANCTHON to escape our notice. He was one of the wisest and best of men of his age, and an illustrious instrument in bringing about the great work of reformation. He was learned in all the sciences; and his genius, which emanated at an early period of his life, displayed its power over every thing he undertook. He defended the works of LUTHER, with indefatigable industry; and gave lectures on theology and education, to crowded and popular assemblies, to the number it is said of three thousand persons. ERASMUS, in noticing MELANCTHON, expresses himself in the following emphatic language: "But good God! what hopes may we not entertain of PHILIP MELANCTHON; who, though as yet very young and almost a boy, is equally to be admired for his knowledge in both languages? What quickness of invention! What purity of diction! What powers of memory! What variety of reading! What modesty and gracefulness of behaviour!" Such was PHILIP MELANCTHON in his juvenile days.

The celebrated Emanuel, Baron, Count SWEDENBURG, had so exalted an opinion of the divine philanthropy, which dwelt in the

bosom of the amiable MELANCTHON, that while he expressed his doubts of the felicity of a CALVIN, he has assured us of the eternal happiness of a MELANCTHON, to whom he has given the appellation of the guardian angel of LUTHER.

Nor is it to such men alone as LUTHER and MELANCTHON, that we are indebted for information and improvement; we might name many, who distinguished themselves, though in a lesser degree, in emancipating their fellow creatures from the shackles of prejudice, ignorance, and superstition, and to whom education also owes its improvement.

The mind of man may be enriched with learning of a particular kind, which may be useful or the contrary. He may talk fluently of the *sublimity* of MILTON, the *majestic march* of DRYDEN, the *mellifluous versification* of POPE, the *humour* of SWIFT, the *conceits* of COWLEY, the *descriptive powers* of THOMPSON, the *sweet simplicity* of GOLDSMITH, or he may quote HOMER, VIRGIL, and TACITUS; but this will be of little avail, if his mind is not enriched with that knowledge which would conduct him to the temple of wisdom and happiness.

If he is invested with the badge of real learning, whose diadem is perfection, whose jewel is virtue, he may build his superstructure on the adamantine rock of ages, which neither the elements, nor the hand of time, can put asunder. Considering, therefore, the value of an *useful* education, let us unite in sentiment with BECCARIA, that "the most certain means of rendering a people free and happy, is to establish a perfect method of education."

Shall I call your attention to the emphatic language of CRATES, the philosopher, who wished to be on the most exalted eminence, that he might cry aloud to the inhabitants of the city, "O senseless generation! how foolish are ye to think only of heaping up riches, and absolutely to neglect the education of your children, for whom you intend to amass it!" Being impressed with these important truths, let it be said, that among the duties we owe to society, that of properly educating children, is not among the least. In governments, like ours, every one should know his rights, that he may learn to prize them. Ignorance is incompatible with free governments, it may be called the grave of liberty. In the United States, which enjoy superior advantages over other nations, in this respect, as in all others, education has been so much attended to, that ignorance bears a smaller proportion in the general scale, than elsewhere. Professor RUSH* remarks, that from a strict attention to the state of mind in this country, before the year 1774, and at the present time, he is satisfied the ratio of intellect is as twenty are to one, compared to what they were before the American revolution. And Dr. MORGAN,† so long

* See Dr. RUSH's "Six Introductory Lectures."

† See MORGAN's Address before the trustees of the then college.

back as the year 1755, justly remarks, "O! let it never be said in this city, or in this province, so happy in its climate and its soil, where commerce has so long flourished and plenty smiled, that SCIENCE, the amiable daughter of liberty, and sister of opulence, droops her languid head, or follows behind in slow unequal pace."

Public happiness, it must be obvious, depends so much on education, in its most extensive sense, that it can not be too leading an object of our regard. Every citizen, in every station, ought to know enough to be able to judge for himself in all the great transactions of life, and to be proof against the practices of the ambitious and designing. An ignorant man in the hands of a knave, is like a mischievous weapon in the hands of a madman; but a well informed citizen, is not only the guardian of his own rights, but the safeguard of the honour and rights of his fellow citizens. What motive more powerful, more useful, more honourable; what principle more energetic, to rouse the every passion of the human mind towards the extension and perfection of education!

Certain distinctions are not, as some imagine, merely metaphysical, but are established by nature. On this principle the system of PESTALOZZI is founded.*

A child, says the ABBE DE CONDILLAC, is taught to give the name tree, to the first which is pointed out to him. The next tree he sees, presents the same idea, and he gives it the same name. This he does likewise to a third and fourth, till at last the word tree, which he first applied to an individual, comes to be employed by him as the name of a class or genus; it becomes an abstract idea, which comprehends all trees in general. But when he learns, that all trees serve not the same purpose; that they do not produce the same kind of fruit, he will soon learn to distinguish them by specific and particular names.

It is obvious, therefore, that the *exercise of the senses*, must evidently be the direct way to improve the intellect. The farther we penetrate into this subject, the more we perceive the importance of forming the mind agreeably to nature; and to promote a spirit of piety and virtue, as an indispensible appendage to a system of education.

Another error, of which the human mind is susceptible, and which is probably owing to an imperfect education, is that of *incorrect reasoning*. The ABBE DE CONDILLAC has said, that instead of applying observation to the things we wish to know, we have chosen rather to imagine them.

Advancing from one ill founded supposition to another, the mind can not fail to bewilder itself amid a multitude of errors. These errors becoming prejudices, are often adopted as principles, and we thus bewilder ourselves more and more. How often do we advance argument without fact, abuse words, convey vague

* See Mr. NEEF's 12mo. on education.

and indeterminate ideas, and thus, by assuming false data, call this the art of reasoning.

When matters have been brought to this length, when errors have thus been accumulated, there is but one remedy by which order can be restored to the faculty of thinking; this is, to forget all we have learned, to trace back the ideas to their source, to follow the train in which they arise, and, as Lord BACON says, to frame the human understanding anew.

We are told in the sacred writings, "Train up a child in the way he should go, and when he is old he will not depart from it."

The mechanism of the mind may be shewn by considering its operations under several distinct qualities, *viz.* Sensation, Observation, Reflection, Apprehension, Memory, Judgment, Cogitation; which, however, will be considered in their respective places. Sensation is dependent on the senses. Observation distinguishes man from the brute creation. Reflection is the improvement of reason, which takes its source in observation. Memory is a quality or function of the mind produced by observation, and reacted upon by reflection. Judgment enables us to perceive the different properties of things, and may be compared to a balance, in which ideas are weighed. Cogitation is the conjunctive exercise of the faculties of the mind.

He who contrasts the English *sensibility* with the *irritability* of some nations, and even of the same nation, will find a peculiar character in this respect. Thus the Frenchman, at the sound of an unmeaning word may draw his sword, the Turk his scymater, the Indian his tomahawk, or the Englishman clench his fist.

Animals of every description, are born with different capacities of sensation, which may be called aptitudes, but not ideas; as ducks, to love water; chickens, to fear it. Instinctive aptitude has no relation with intellectual sentiment.

The faculties of sensation, observation, and reflection, may be compared to the chords of a musical instrument, which have acquired their proper tension, through fear, solitude, and doubt: the remaining faculties may be compared to time, notes, gamut, and bow, which altogether cooperate to harmonise the instrument mind. When these are agitated by the tempest of passions, the vessel of reason, must conform itself to the storm, masts must be struck, sails must be furled, windows must be darkened, and decks must be inclined.

Correct reasoning undoubtedly depends on the right application or use of the senses. In every sensation, there are two things to be carefully distinguished; the change produced in the mind itself, and the properties of external objects, which are the causes of that change. *Secondly*, Sensations are consequently divided into those of impulse and of consciousness; the former are produced by causes existing without the sentient being, while the latter have their source within him. *Thirdly*, In order to produce sensation, it is necessary for the cause to act with a certain degree

of force, and for a certain length of time. Very weak impressions, though acting almost constantly, are without effect, and the strongest impulses, if only momentary, are scarcely perceived. *Fourthly*, For any impulse upon the organs of sense to be effectual, it is further requisite, that it be seconded by attention of the mind. Without the mind is earnestly engaged, or volition employed, no progress can be made; for as the will governs, however powerful the external impulse may be, it is as necessary for the mind to be prepared, as it is for the senses to be brought into action.*

Fifthly. The nature and strength of sensations depend upon three circumstances; the original constitution, in which I include the present state of the whole frame, as well as that of particular organs; the force of the external impulse given to the senses; and lastly, the attention of the mind employed upon the subject. Consequently, a sensation of a determined force may be produced by an infinite number of different proportions, between the external agent, and the attention of the mind; as on the one hand, a strong perception may take place with little or no attention of mind, *provided* the impression from without be very powerful; so on the other, an equal perception may arise without any external impulse, by an *uncommon* exertion of mental attention. It often happens, however, that both the internal and external impulses are brought into action: certain faculties can not exist without this union.

The surprising faculty of memory, is founded on this circumstance.

> "Each passing form, the pausing heart delights,
> And young SENSATION every nerve excites.
> Oft from sensation, quick VOLITION springs,
> When pleasure thrills us, or when anguish stings;
> Hence *Recollection* calls with voice sublime
> Immersed ideas from the wrecks of Time,
> With potent charms in lucid trains displays,
> Eventual stories of forgotten days.
> Hence *Reason's* efforts good with ill contrast,
> Compare the present, future and the past." DARWIN.

We are fully convinced, that the *principles* of all knowlege are founded in mind; the mind of man either animated by desire, or pressed by necessity, puts in action its various energies, as we have just remarked. We *reason* correctly when we apply to any subject those ideas which are derived from its real nature; but, if prejudice or any other cause usurp the seat of truth, we fall into every kind of error. We conclude before we have reasoned, reason before we know, and presume we know before we have examined.

* See note 18.

In education, the more simple the object is in itself, the sooner the mind discovers its various relations, and is enabled to rise from one truth to another, till it reach those that are the most abstract.

May we not compare mental improvement to the philosophy of motion? In the wheel and axle for instance, the velocity of the power is to the velocity of the weight, as the circumference of the wheel is to the circumference of the axle; so in education, the velocity of the mind is to the velocity of the senses, as the circumference of the mind, is to the circumference of the objects. In other words, the *action* of genius, or reflection, is dependent on the quickness of the sensations, and the sensations, if of a particular kind, are dependent on external impulse, exactly in the same ratio as power is gained in the wheel and axle.

SIMONIDES was led to form a method of associating the ideas of objects, to be retained in the memory, by the assistance of *emblems*, *types*, *archetypes*, and *symbols:* hence the utility of demonstrations, experiments, and the like, in order to impress upon the mind in a more direct manner, (viz. by *external impulse*) the knowledge of different subjects.

It would appear from this circumstance, that the heathens derived their religious ceremonies, from the association of ideas with the object they so worshipped. But as GOD is an abstract being, he can be worshipped only in "spirit and in truth."

Memory (1 *Cor.* 15, 2.) is that faculty of the mind, by which it retains the images and remembrance of things we have seen, imagined, or understood.

Mr. FEINAGLE of Baden, has instituted a system for impressing ideas on the mind, to be retained in the memory; and was highly approved at the Royal Institution, Great Britain, where an exhibition took place before a numerous assembly of ladies and gentlemen.*

The best preceptors have recommended the exercise of the organs of sense; and, indeed, ROUSSEAU remarks, that "if we would learn to think, we must exercise our organs, which are the implements of the understanding."

The celebrated German writer, SALZMAN, asks, "Is an artificial cultivation of the senses practicable? In other words, can the senses be cultivated in a degree more than is common? Is it productive of any benefit? In what manner can the senses be cultivated?" On the practicability of cultivating the senses, he says, "We see daily, that a man whose occupation has required the exercise of his sight, or of his feeling, in a particular way, has obtained a great superiority over other men in the accuracy of it: and there have been blind men, who, by applying the sense of feeling to that object, have acquired the capacity of distinguishing

* See the STAR, an English Paper.

colours by the touch. In Puiseaux lived a chemist and musician, who had been born blind. He learned to read by means of letters cut in relief, and taught his son to read also. He estimated his distance from the fire by the degree of heat it gave, and could tell when he came near any thing, by the impression the air made on his face."

Other instances, of a similar nature, have also occurred. We read of SAUNDERS, the blind professor of mathematics at Cambrige, having such nice feeling that he could detect spurious coin among any number of genuine ones.

We read also of the blind sculptor, who modelled the figure of the great duke COSMO in clay, with the greatest accuracy, as he did that of pope URBAN the eighth, and that of the duke BRACCIANI in a dark cellar. Facts of this kind are the more interesting, as they appear to confirm an opinion long since entertained, that *extensive capacities* are hidden in each of the human senses, which necessity, want, and disease, the defect of some other sense, monstrous confirmation, or accident, occasionally discloses.

Instances sometimes occur, of persons remarkable for some peculiar *capacity*. We have a striking example of this in ZERA COLBURN, a lad of about eight years of age, whose mathematical or rather arithmetical powers, if I may be allowed the expression, are truly remarkable.* Our attention is called, on considering these circumstances, to the system of PESTALOZZI, by which children acquire in a short time, the facility of determining the power of numbers, geometrical definitions, problems, &c.

That none of our *ideas* are innate, but are acquired through the medium of the senses, is evident from fact, and from the observations of LOCKE, the ABBE DE CONDILLAC, and STEWART. Perceptions and sensations have the same origin. For instance, the rays which proceed from an object, strike my optic nerve, I have a *perception* that points out to me the presence of the object. They affect this nerve, in a very violent manner; I have a *sensation*, which I express by the terms grief and displeasure, and *vice versa*.

It can scarcely be questioned, therefore, that the rectitude of a man's understanding, the quickness of his intellect, and the soundness of his judgment, must be in proportion to the accuracy of his senses, the facility with which they perform their functions, and the clearness of the perceptions they convey to the mind. If the senses be dull and the perceptions obscure, to a certain degree, an idiot is formed. This happily, is not a frequent occurrence; but if we look abroad, into the world, how many shall we find, who judge so erroneously on various occasions, that you would often suppose them in want of common sense! Where this is not the effect of prejudice or passion, it can arise only from the

* See the Port Folio, Dr. MITCHELL's letters, the files of the National Intelligencer, and the Aurora.

dulness of the senses, or the obscurity of the perceptions. That the senses are capable of improvement, has already been shewn; and if the mind acquires all its faculties through the medium of the senses, the exercise of the senses must evidently be the direct way to improve its capacity; at the same time that it will prove indirectly the means of eradicating our prejudices, and giving reason the superiority over the passions.

However powerful errors may be, the empire of truth, if once established, will be incomparably greater. The human mind, like a mirror, must be smoothed and polished, freed from false imaginations and perverted notions, before it be fit to receive and reflect the light of truth. We may, therefore, with the PYTHAGOREANS lay it down as a maxim, that human advancements should be preceded by, or accompanied with, a suitable degree of purification; for, as the diseased eye endures not, until it be restored to health, the view of bright objects, so neither can the mind, without due purification, steadily contemplate the beauty and splendour of truth. To doubt cautiously, till you have examined fully, and restrain your assent, till you have seen clearly, are proofs of reason and force of mind. How necessary, therefore, is the exercise of the faculties; and it is indeed to education, that we owe the proper use of them.

Truth is a positive, falsehood a negative quality. Truth is the health, error, the disorder of the mind.

Error is that falsehood, which, availing itself either of the weakness of the intellect, the depravity of the will, or the undue influence of the imagination, assumes the appearance of truth. As the purification of the mind renders it a fit receptacle for DIVINE TRUTH, so mental improvement, agreeably to a proper method of education, can not fail to banish error, give reason the superiority over the passions, and establish truth amid the jarring opinions of the world. On every man it is incumbent, to cultivate a disposition of mind which will make him open to conviction, and ready to acknowledge and rectify error.

The *diversity* of senses, by which the sensorium receives the impressions of objects, produces a *relative* diversity in her perceptions and sensations. From hence, the passions arise; those impetuous motions, those secret inclinations, those restless appetites, those urgent desires, which destroy the equilibrium of the SOUL, and impel her towards certain objects.

Is not truth, in a greater or lesser degree, governed by the senses? If it is, will not an *improvement* of the senses render the mind susceptible of appreciating truth? In other words, would not a *perfect* method of education counteract the *baneful habits* of the mind?

Tho' truth be one, and every necessary truth be obvious, yet that there is various opinions respecting it among creatures constituted as we are, is as certain as that there are such opinions. Truth, however, is seldom the object, as reason is seldom the

guide: but every man's pride and every man's interest requires that both should be thought to be on his side. From hence all those disputes, both public and private, which render the state of society a state of warfare, the warfare of tongues, pens, and swords! Hence, disputes become contests between man and man, and party and party; instead of being what they should be, comparisons of opinions, of facts, and reasons: by which means each side goes off with triumph, and every dispute is a drawn battle.

A system of correct reasoning ought at all times, and on all occasions, to be instituted; and in learned and fine spun theories, principles ought to be established before deductions are formed. To those who establish doctrines on physical subjects, without considering truth, as the omnipotent artificer, the language of a celebrated writer may be applied. Are these lovers of wisdom, these searchers of truth, nothing better than venders of false wares, venders of hypothetical systems at best, and often of such as are entirely fantastical? If they are, we might add, that they put us in mind of a passage in PLUTARCH, who compares the STOICS to ships, that set out under auspicious names, the Success or Swiftsure for instance, and who are beaten by tempests in their voyage, or cast away. The great mischief is, that the implicit passenger, shares the fate of the unwary mariner. How guarded and circumspect should we be, before we receive opinions, theories, or principles, without *analysing* them by the *test* of truth!

Philosophers, in all ages, have amused mankind with systems of imaginary knowledge, raised on fantastical ideas and notions, instead of confining themselves within the limits of real knowledge. Instead of fixing our opinions by evident truth, and giving the mind any solid foundation whereon to rest, they have involved us in doubts. Like NOCTAMBULES, they have staggered about, and jostled one another in their dreams. It may be said, however, that since the torch of experimental philosophy has been lighted up, these hypothetical reasonings have been exploded, or else confined under certain conditions in all that relates to corporeal nature.* Notwithstanding the extent of our powers, we can make no progress higher than *sense*, unless we take creation for our lesson, and the OMNICIENT CREATOR for our preceptor. The wise man would undoubtedly be confounded by his own wisdom, if he were not to allow the Deity to discover himself in his works. There have been men it is true, of this description. If it required proof, I need only mention the writings of HELVETIUS, VOLTAIRE, DIDEROT, DE LA METRIE, and the whole school of CONDORCET.

The man of reflection, without penetrating the depths of science, needs no assistance from the philosopher to be informed, that HE, "who measured the waters in the hollow of his hand, and meted out the heavens with a span," has so governed the universe with invariable laws, as to evince a providential goodness

* See note 15.

on all the things, both animate and inanimate, which are formed, protected, and supported by CONSUMMATE WISDOM.* He may say, indeed, to the philosopher, as DIOGENES did to ALEXANDER, "Only please to stand out of my sunshine!" We are fully convinced in considering education in a more exalted sense, that nothing is intelligible in philosophy, but the action of matter upon matter: the power of impulse is the only sensible and experimental cause of motion. We are also of opinion, that the knowledge, which is acquired by metaphysics, although not founded on experiment, as in physics, is sufficiently clear with respect to abstract truth, (if I may be allowed the expression,) to afford the most sublime ideas of the wisdom, power, and goodness, of the GREAT AUTHOR OF ALL THINGS.

If metaphysical science be wanting, call in physical, which is deducible from the globe we inhabit, and you will have incontrovertible testimony. Testimony drawn from nature herself, written with the pencil of a God!

> "Degenerate minds in mazy error lost
> May combat heaven, and impious triumphs boast;
> But while my veins feel animating fires
> And vital air this breathing breast inspires,
> Grateful to heaven, I'll stretch a pious wing,
> And sing HIS praise, who gave me power to sing." BLACKMORE.

Education if of a proper kind, will lead to true knowledge, which becomes an engine of unlimited power in the hand of man. It is not, indeed, as Lord BACON says, an idol of the cave, an idol of the market, nor an idol of the theatre; but, an idol of God!

Understanding may be considered the faculty of perceiving things; reason, of tracing causes and effects from a chain of ideas; and judgment, of discerning the different properties of things.

The exercise of the mental faculties, even in a philosophical view, will lead to truth. We have already remarked, that the soundness of our understanding, reason, and judgment, depends on the clearness and accuracy of our senses. From the want of exercising the senses, the faculties of the mind acquire a habit of indolence.

Nothing deserves so much to be shunned, says SALZMAN, as indolence, mental and corporeal; for nothing has occasioned so much mischief, so much misery, and so much unhappiness in the world. The exercise of our senses, therefore, is of the highest utility; and certainly it is no small improvement in our system of education, that we begin to instruct children more by imprinting ideas upon their minds through the medium of the senses, instead of filling their heads with empty words, which often convey to them vague, if not erroneous ideas, and thus lay the foundation of many subsequent mistakes in their judgment and conduct.

* See note 9.

From this principle it follows, as an UNERRING LAW, that the first step to the excitement of an idea, is an impression made upon some one of the organs of sense. This impression may be perceived, or it may not be perceived: and, if it be perceived, the perception may be complete, incomplete, or erroneus. Thus our attention is called to the truth or falsehood of the perception, its completeness or incompleteness, and the slumber of the sense. By rational reflection, by consideration and inquiry, man asserts his station among the other creatures of GOD upon earth. What principally distinguishes him from them? What raises him above them? What renders him capable of ruling over them? Is it not reason, and the use of it, which consists in reflection, in consideration? Man is considered a reflective, sensitive, and vegetative being. If so, ought he not to record it as a moral duty to acquire a LOVE OF WISDOM?

When a child is educated agreeably to the tenets of any profession, when he is taught that truth, is that quality by which the mind is regulated, his reflective powers will be called into redoubled action. Thus, the reflecting person revolves in thought: What is that which I now conceive? What are its properties? How is it constituted? What results from it? On what is this idea founded? Is it true or false? What evidences have I in its behalf? In what ways does this matter, this truth relate to me and my happiness? How should I act towards it? In this manner he endeavours to render his conceptions and ideas of the most important objects, progressively, more perspicuous, more complete, more certain, more interesting, more useful. This is the business, the daily, the favourite occupation of every man, who knows and feels his dignity, and his destination, who asserts his rank in the scale of creation, and for the earnestness of a being created for immortality, is in pursuit of WISDOM, of VIRTUE, of HAPPINESS!

While we are on this topic, permit me to call your attention to some of the *sayings* of SOCRATES. SOCRATES asked MEMNON, the Thessalonion, what was virtue? He replied, that there was one virtue of a child, another of a man, another of a woman, one of a magistrate, one of a master, and another of a servant. "Very good," replies SOCRATES, "I ask for one virtue, and you give us a whole swarm;" truly conceiving, that he understood not one virtue, who was unacquainted with the meaning, or definition of the word.

Being asked by GEORGIAS if he did not consider the great king of Persia happy? "I know not," answered he, "how he is furnished with learning and virtue."

SOCRATES said, "that he wondered at those who carved images in stone, that they took such pains to make stones resemble men, whilst they neglect, and suffer themselves to resemble stones!"

He often said to his disciples, "In the life of man, as in an image, every part ought to be beautiful." Being demanded what *nobility* was, he replied, "A good temper of body and soul." On

seeing a young man, who was wealthy, voluptuous and unlearned; "Behold," said he, "a golden slave!"

Many allegorical expressions, not only of the ancient philosophers, but of the apostles in the sacred writings, might be adduced to show, that education, which inculcates virtue in every form, was considered in those times as essential to the human constitution, to the happiness and *well-being* of man. Truly with a celebrated author we might add, that where virtue is the result, it will cease to be a task of perpetual watchfulness and contention. It would neither be, nor appear to be, a sacrifice of our personal advantages to disinterested considerations. Or with SHAKSPEARE we might remark, that

"Virtue is bold, and goodness never fearful."

"Virtue," says an eminent ethical writer,* "is the doing good to mankind, in obedience to the will of GOD."

Friendship, the guardian angel of social affection, (like the lamb the emblem of innocence and purity,) is like other mutual obligations, influenced by education. In tranquil scenes, we behold this virtue calm and moderate, burning with an equal glow, improving the soft hours of peace, and ameliorating the human heart, while it heightens the relish of every social duty. On the other hand, it crowns the lover of his country with unfading laurels, gives a lustre to his actions, and consecrates his name to the latest ages.

The Hebrews, Egyptians, and Greeks believed, that they could more effectually teach their youth maxims of virtue, by calling in the aid of music and poetry.

When we read of a REGULUS exposing himself to the most cruel torments, rather than break his word, a CYRUS and a SCIPIO giving public examples of continence and wisdom, all the ancient Romans so illustrious and so generally esteemed leading a sober and steady life; and on the contrary meet with actions of treachery and the like in great and considerable persons, surely we could not hesitate a moment to pronounce in favour of virtue.

It would appear from the writings of antiquity, that the art of sculpture, which is capable not only of adorning a palace or a theatre, but of producing excellent moral effects, by representing in a forcible manner the vices, or perpetuating the virtues of mankind, was well known among the Greeks, from whose statues in the Vatican, much of the merit of modern artists is derived. These statues, no doubt, were intended to remind them of certain obligations and duties, as well as to serve for ornamental decorations.

The writings of the ancients afford some excellent precepts. "Esteem," says PYTHAGORAS,† "is a great part of good education, to be able to suffer the want of education in others."

* PALEY. † STOBÆUS.

We read of CATO, the Roman censor, who told his friends, that of three things, if ever he happened to be guilty, he always repented: if he divulged a secret; if he went on water when he might stay on dry land; and if he let a day pass without doing, or endeavouring to do some good. It was a custom, in those days, to inculcate silence. PYTHAGORAS, indeed, made it a preliminary requisite for his scholars to "*keep a tongue of good report*" for five years, previously to their *initiation* into his doctrines.*

ANAXARCHUS when taken, says PLINY, before he would divulge the doctrines that had been intrusted to him, bit his tongue in the midst of his teeth, and afterwards threw it in the tyrant's face.

The Athenians, it is well known, had a statue of brass to declare this virtue; the Egyptians a God, and the Romans a Goddess. If a virtue of this kind was so preeminent on the altar of Israel and of Rome, how much more should the christian virtues and graces adorn the human character of modern times?

As education comprehends not only elementary, but transcendent learning, it may not be improper to take a view of knowledge, and examine the various relations of man.

If we, therefore, contemplate the system of knowledge, from the consideration of man in his relations, we can not fail to perceive the beauty, order, and perfection in the various subjects emanating from the DIVINE WILL.

The analysis of knowledge, considered with respect to the different relations of man to *natural beings*, to *himself*, and to *other men*, forming three important heads, will afford an interesting topic for animadversion.

With regard to GENERAL RELATIONS. We consider *mathematics* and *quantity*, including arithmetic as expressed by numbers, and algebra, as expressed by letters and signs, together with *extension*, comprehending elementary and transcendent geometry, as forming interesting branches of this head.

Nor is *motion*, considered with respect to bodies subject to our observation and power, as in mechanics; nor in *statics*, *hydrostatics*, *dynamics*, *hydronamics*, and *hydraulics;* nor in *astronomy* and *dialling*, are we to lose sight of Nature's unerring laws.

If we view PARTICULAR RELATIONS, embracing *physics* and *chemistry*, with the numerous divisions and subdivisions, as *light*, *optics*, *catoptrics*, *dioptrics*, *electricity*, *magnetism*, *pneumatics*, *acoustics*, *meteorology*, *&c.* a successive study of these sciences will bring us to observe the globe, and the various changes taking place in, about, or in relation with it. Or, if we consider INDIVIDUAL RELATIONS, which *natural history* affords, as the doctrines of geology, cosmogony, cosmography, minerology, botany; or as it respects the *beings* which inhabit the globe, as insects, shells, reptiles, fish, birds and quadrupeds, surely so vast a field

* JAMBLICHUS.

for contemplation and research, will awaken the every passion of the human mind!

Man, considered as a PHYSICAL BEING, acquries a knowledge of his frame by *anatomy* and *physiology;* and for the means of remedying the causes that derange the economy of his system, he calls in the aid of surgery, medicine, and pharmacy.

Man, considered as an INTELLIGENT BEING, is gifted with *sensations* or *faculties* of various kinds: Hence he has understanding, memory, imagination, sleep, dreams.

The *reciprocal* action of the body upon the mind, produces wants of different kinds: hence it is, that sensations of pleasure and pain, desires, passions, judgment, volition, necessity, take their origin. The art of judging of the *intellectual* faculties, by the construction of the head and features, constitutes the doctrines of craniology and physiognomy.

The mode of communicating our *thoughts* is through the medium of *speech;* in relation to which grammar and logic are to be considered. Our thoughts may also be communicated by signs, gestures, characters, or symbols. By eloquence, poetry, music, &c. certain passions are expressed.

In a state of CIVILIZATION, *agriculture*, or the art of cultivating the earth, the fine arts, the mechanic arts, social compacts, and duties, are the result. Hence the use and application of mineral, vegetable, and animal substances; of painting, sculpture, architecture, writing, printing; formation of governments and societies; of religion, jurisprudence, morality, politeness.

Under the head of POLICY we *may* include the rights of nations, history, voyages, geography, war, land and naval tactics, comprehending fortification, artillery, &c.

These various subjects, taken together, may be said to form a more extensive system of education. Many of them, however, are not essential in the ordinary purposes of life, and such as are, constitute the different professional and scientific studies.

The man whose mind is enriched by the knowledge of science, is a useful citizen and an ornament to his country. But, notwithstanding learning is a powerful instrument in the hand of man, if his conduct is not upright in every sense of the word, to constitute him a good man, he becomes in fact a dangerous friend, and a dangerous citizen.

A moral education is, therefore, as essential, as a scientific education. There is, indeed, a wisdom in virtue, as there is a wisdom in knowledge.

As God is the fountain of all goodness, of all wisdom, so man, a reflective being, should be the fountain of all virtue! And, while he inculcates the precepts of truth, religion, and all the social duties, he will assert his dignity and station upon earth.

This leads us to make some observations, on the nature and meaning of wisdom.

"They who earnestly seek for wisdom," says CICERO, "are called philosophers, for philosophy is nothing more than a love

of wisdom." The wisdom of which the sacred writings speak, has several significations.

Wisdom is taken for that prudence and discretion, which enables man to perceive what is proper to be done, according to the circumstances of time, place, persons, manners, and end of doing. Knowledge directs a man what is to be done; but wisdom directs him how to do things duly, conveniently and fitly. It was this sort of wisdom that SOLOMON intreated of GOD with so much earnestness, and which GOD granted him with great liberality.*

Wisdom is taken for quickness of invention, craft, cunning, and stratagem, of which we read in the book of Exodus. It is also used for doctrine learning, and experience.

In Acts vii. 22. it is said of MOSES, that he was learned in all the wisdom of the Egyptians; "He was instructed in the knowledge of those arts and sciences, for which in those times the Egyptians were famous."

Wisdom is also used in Holy writ, for other purposes, as for true piety, the wisdom of Christ, natural instinct, sagacity, &c.

The following extract from the book of Proverbs will show in what light, and of how much importance, wisdom is considered.

"Happy is the man that findeth wisdom, and the man that getteth understanding; for the merchandize of it is better than the merchandize of silver, and the gain thereof than fine gold: She is more precious than rubies, and all the things thou canst desire is not to be compared with her. Length of days are in her right hand, and in her left are riches and honour: Her ways are ways of pleasentness, and all her paths are peace: She is a tree of life to them that lay hold upon her, and happy is every one that retaineth her."

In the same scriptural view, it is wisdom that teaches us, that the OMNIPOTENT JEHOVAH is like "unto a wall of fire about his chosen people, and a munition of rocks to defend them from every enemy and every evil."

In order to contemplate the beauty, the splendour of wisdom, in its every sense, let the mind be fitted and prepared by a proper education. The mental darkness, shall we say, will then be dissipated, and the light of wisdom, like the noon-tide sun, show forth its resplendent corruscations! Like *Pomina*, the goddess of autumn, she will shower down the fruits of physical and metaphysical knowledge, and steer the bark of human life, through the Scylla and Charybdis, the shoals and the quicksands of ignorance and superstition!

Wisdom, it is said, can not exist without knowledge, though knowledge is often found without wisdom!

Man is so much the creature of education, that his acquired habits become immovable centres, upon which he coordinates all his actions. Certainly then, wisdom, in every sense of the word, ought to be forcibly impressed on the juvenile mind.

* 1 KINGS, iii. 9. 12, 28.

When the great PYTHAGORAS presented himself for the first time, to the admiring eyes of Greece, at the Olympic games, being surrounded by the Grecian sages, he addressed them in all his wisdom and erudition. Astonishment siezed the multitude; they with one voice, demanded by what title he should be called. He answered, that their seven sages had taken the name of wise men, for his part, he wished no other title than a *lover of wisdom*. From this time, the name of philosopher became a general appellation among the learned. The era of philosophy, however, commenced about the forty-ninth Olympiad; when the attribute, or degree, of wise, was conferred on THALES, being then in the fifty-ninth year of his age, and the remaining six, who constituted the seven sages of Greece.

Philosophy in fact, embraces all kinds of knowledge which has wisdom for its object; and is derived from the Greek word *Philos*, a lover, and *Sophia*, wisdom.

Philosophy, founded in wisdom, supported by truth, embraces a wide field of objects. Like many other subjects, however, it has been abused, perverted, and used for bad purposes. Hence, in the days of St. Paul, he bids the Colossians beware, "lest any man spoil them through philosophy."

In Acts, St. Luke relates, that when St. Paul came to Athens, he found Epicurean and Stoic philosophers, who made a jest of his discourses; and no wonder, as they placed the chief happiness in pleasure, and denied the providence of GOD. This, in the language of the apostle, was false wisdom.

Let us now offer a few reflections on the nature of genius.

It has often been asked, what is genius? Of all the terms to which strong signification is annexed, opinion has been most varied concerning its definition. The ancients believed it inspiration: the moderns every thing but this. MONTESQUIEU considers it as an effect of climate; HELVETIUS, of a favourable education. Dr. JOHNSON defines it, "that energy, which collects, combines, amplifies, and animates; active, ambitious, enterprising; always imagining something greater than is known; always endeavouring something better than it performs; that power, without which, judgment is cold, and knowledge inert."

Dr. RUSH describes genius as reason on wings, and reason as genius on foot.

Men of genius, in the language of a celebrated writer,* are luminous points on the great disk of society, which shine after the sun of power and prosperity has withdrawn its beams, and rescue the nations they adorn from total darkness, in the long eclipse of time.

Expert men, says Lord BACON, can execute and judge of particulars one by one; but the general councils and the plots, and the marshalling of affairs, come best from those that are learned.

* MR. DENNIE.

With the poet we might add:

"With weighty steps the man of *genius* treads,
His knowledge opens, and his wonder spreads."

Men of genius have indeed emancipated the human family, from the shackles of ignorance. On the first dawning of science, the veil, which obscured the mental vision of thousands, and tens of thousands, was torn asunder. The light of knowledge penetrated the dark abodes, and raised the sublunary temple of wisdom, the guardian genius of science, on the ruins of elder time. Like the Phœnix rising from its ashes; learning has arisen with a new lustre! Like the arch of heaven, supported by the pillars of wisdom and strength, it has spread from pole to pole! Like the zodiac, on which the northern and southern signs are marked, learning is a *circle* illumined by the *constellation* of virtues! But it is to genius, whatever may be its origin, that we owe the incentive to action: laudable ambition, or a motive equally powerful, impels the mind to pursue certain objects.

To attain excellence in any art, ARISTOTLE says that three things are requisite; nature, study, and practice. Without industry, knowledge can not be acquired; genius will soon be exhausted, if the soil is unenriched by foreign stores. It will have no materials to work upon, no ideas for imagination to combine; and it can become fruitful only in proportion to its resources.

The best writers on education, among whom I notice with pleasare the celebrated FORDYCE, observe, that parents should take care, that what they teach their children is suited to their natural genius and constitution; and in minds of a superior order, the natural genius should rather be restrained than impelled. Again, we find that genius has been considered a negative quality. Hence, HELVETIUS says, that it is the result of education. Is genius self-existent? It is a *quality*, not a *principle* of the human mind.

"To be self-existent, endued with Almighty power, and to will with infinite wisdom, are the adorable perfections of the FIRST CAUSE."

As it requires genius to form, plan, and oftentimes to carry into execution, we may assert, by carrying our position thus far, that genius in this instance is self-existent, and co-existent with infinite wisdom. But in man it is a quality of the intellect brought into action, either directly or indirectly, by the senses. Genius may, therefore, be owing to the clearness of our perceptions, and the accuracy of our senses? On the contrary, it may be said, that we all possess, in some shape or other, certain desires to pursue certain objects, which are actuated by a motive called *natural* genius. Here the *motive* governs the volition, and the will, by thus being impelled, act according to the impulse.

Does not reflection and instinct, or a natural aptitude, form what is called genius in the human species? In the brute, in-

stinct is peculiar; and by no means influenced by reflection; therefore, it has no relation with reason. If such is man, he may be justly styled a reflective being, and the master-piece of earthly creation.

Lastly, If the theorem is correct, in the doctrine of optics, that the angle of incidence is equal to the angle of reflection, or, in chemistry, that the union of oxygen and hydrogen forms water; we are of opinion, which is by no means original, that the mind *acquires all* its relations through the medium of the senses; and that genius is a quality, which, considered in one view, *predisposes* the will to accomplish certain things. Hence Dr. JOHNSON justly remarks, that without it judgment is cold, and knowledge inert.

It must be obvious to every mind, that the extensive influence of a well cultivated understanding, not only in promoting our happiness, but in adding to the advantages which a kind providence has bestowed on us, affects all classes of society equally alike.

Learning is, therefore, entitled to the attention of the FAIR SEX.

In referring to ancient days, we find illustrious females justly distinguished in the temple of science. If we unfold the pages of history, we read of an ATOSSA, HIPPARCHIA, PAMPHILLIA, AGILLIS, PAULLA, LAETA, FABIOLLA, and many others, who flourished as eminent of their sex in the different departments of science.

PYTHAGORAS instructed not men only, but women; and indeed the Stoics, Epicureans, and even Academics, delivered their lessons freely to both sexes, and all conditions.

Who was more learned than ZENOBIA, queen of Palmyra, by religion a Jew? We have the testimony of her conqueror himself, the EMPEROR AURELIAN, to her character, in his letter to the Roman Senate. Besides being acquainted with Latin, Greek, Hebrew, and other languages, she wrote the Alexandrine and Oriental history, and was also celebrated in military tactics. She headed an army of 700,000 men.

We are told in "*Cælibs in search of a wife*," that the woman who derives her principles from the bible, and her amusements from intellectual resources, from the beauties of nature, and from active employment and exercise, will not pant for *beholders*. She lives on her own stock. Her resources are within herself. She possesses the truest independence. She does not wait for the opinion of the world, to know if she is right; nor for the applause of the world to know if she is happy.

In the infancy of Rome, the education of women consisted in learning the duties and employments of domestic life; such as cooking, spinning, weaving, and sewing; which were taught them by their mothers or relations. But when Rome aspired to that flourishing state, which marked the era of her improvements, as the arts and sciences became more general, the education of the women began to be extended on a larger scale; and to the domestic duties taught them by their mothers, were added such parts of

polite education, as were thought necessary for cultivating their minds: this education we know, from the story of Virginia, they received at public schools; where sciences and literature, no longer confinded to rigid philosophers only, began to assume a softer form, and to suit themselves to female talents and genius.

But how exalted does the female character appear, when we read, that they preached in public, supported controversies, published and defended Theses, filled the chairs of philosophy and law, harrangued the popes in Latin, wrote Greek, and read Hebrew; nuns became poetesses, women of quality divines, and young girls, with a softness of eloquent enthusiasm, publicly exhorted the christian princes to take up arms for the recovery of the Holy land! We are furnished with a variety of interesting facts, by Dr. ALEXANDER, in his History of Women. "We pretend not," says he, in speaking of female education, "to chalk out the plan in which women should be educated; only, this we venture to affirm, that it should, if possible, be such as to avoid ignorance on the one hand, and pedantry on the other; ignorance makes a female companion contemptible, pedantry makes her ridiculous; nor is it easy to say, which of the two is most disgusting."*

> "The *brightest* forms through *Affectation* fade
> To strange new things, which nature never made" YOUNG.

Having thus shewn the importance of learning, permit me to call your attention to another subject, connected indirectly with the improvement of the mind, namely, the GYMNASTIC EXERCISES. No writer has so clearly pointed out the benefits which arise from them, than SALZMAN. While they tend to promote a sound mind, and a healthy constitution, they are calculated to form an important *item* in any system of education. And, as SALZMAN justly remarks, if the advantages are so great, it may be asked, how is it that we commonly forget the improvement of the body, though we are fully convinced, that neither wealth nor title, neither learning nor worth, can protect the feeble, the unhealthy and the infirm, from the lamentable effects of their condition? Shall we say, that learning and refinement, are to health and bodily perfection, what luxuries are to necessaries? Or, shall we say, that rational amusement tends to releive the mind at intervals, from serious occupation, and prepares and invigorates it for fresh exertion?

In Ecclesiastes (xii. 12.) we read, that *much study is a weariness of the flesh.*

Gymnastic exercises may consist in leaping, running, jaculation, wrestling, climbing, ballancing, lifting and carrying, walking, military exercise, bathing, swimming, &c.

* See note 10.

MERCURIALIS, who wrote his celebrated work on Gymnastics, not for the antiquarian alone, but as a physician, to excite his contemporaries to receive the beneficial exercises of the ancients, as the means of improving the bodily strength and health of mankind, expresses himself thus: "The ancients had so high an opinion of gymnastics, that PLATO and ARISTOTLE, not to mention others, considered even a commonwealth as defective, in which they were neglected."

The public solemnization of these exercises, united with those of the *mind*, at the Olympian, Isthmian, Pythian, and Nemean games, which were far from mere sport, sanctified the lofty sentiments of these people, and even their religion. The remotest parts of Greece poured forth their multitudes, repairing by land and sea, to the first provinces of the Peloponesus, the fertile fields of Elis. From Sicily, Italy, Asia Minor, and partiularly from the great Peninsula, they flowed to Olympia, to be present at the games formerly instituted by HERCULUS, and revived after a long interval, by LYCURGUS and IPHITUS.

THUCYDIDES tells us, that in very remote antiquity, there were "games of bodily exercise and of music, in which cities exhibited their respective chorusses." In testimony of this, he quotes certain verses from HOMER's hymn to APPOLLO.

A German writer, in advancing certain arguments in favour of bodily exercise, very justly remarks, that there is not a greater and more reprehensible mistake in education, than the raging propensity of compelling children to extraordinary *mental* exertion, and exacting from them a rapid progress. This is the grave both of their health and their talents.

Among the means of improving the health, bathing is particularly recommended. The same writer adds, that he considers the cold bath as an essential object in a good physical education; and a bathing place as an indispensible appendage to a public school.

If there is an intimate connexion between the mind and body, certainly the exercise of the senses, in every shape, will continue to keep up the proper tone and vigour of the mental facuity.

After acquiring the rudiments of education, the pupil will be susceptible of obtaining a correct knowledge of the arts and sciences. Here a rich harvest will open itself to his view.

Natural history, comprehending zoology, botany, and mineralogy; chemistry, astronomy, natural and experimental philosophy, and other collateral branches of science, will present a vast fund of inexhaustible treasure.*

Of how much more importance is a knowledge of the sciences, with respect to our immediate comforts and happiness, than the DEAD LANGUAGES? At least we are of opinion, that in collegiate education too much time is taken up in the acquirement of Latin,

* See note 13.

Greek, and Hebrew. However useful they may be in their place, they can never add to our use, happiness, and rational pleasure, as much as the arts and sciences. On an examination into the comparative merits of each, permit me to call your attention to the Manchester Memoirs, in which you will find a correct, though impartial analysis of each.

What is the great object of learning? It is to ameliorate our condition, by adding to those advantages, which we naturally possess. What are the advantages of learning? They are, indeed, many. What would avail the deep and speculative enquiries by which the learned attempt to penetrate the source of INFINITE WISDOM, if their labours did not produce benefit to their fellow creatures?

Why does philosophy stand highly conspicuous? Because it affords pleasure, promotes our interest, supplies our necessities, and adds to the general happiness of mankind.

Researches in philosophy tend to make the minds of its students cheerful, tranquil, and happy; and the science itself may be considered as the most sublime and refined species of drama; but with this difference only, that here the entertainment and instruction are produced, not by fictitious scenery, but by real exhibitions of the operations and changes of nature.

BURG, a celebrated writer on education, considering the utility of philosophy, thus expresses himself: It would be of great advantage to youth, if they could as a part of education, have an opportunity of seeing a course of experiments in natural philosophy. They would there learn in the most entertaining manner, the grounds, as far as known, of the noble science of physiology. And in seeing a regular series of experiments and observations in mechanics, hydrostatics, pneumatics, optics, astronomy, chemistry, and the like, would have their curiosity raised to the highest pitch, and acquire a taste for knowledge, which might not only lead them in after life to pursue their own improvement in the most valuable ways, but likewise may, by furnishing an inexhaustible fund of entertainment, supercede every kind of frivolous pursuit.

It may be said, that when the pupil is taught to contemplate the handy work of his creator, his genius will be awakened, and the wisdom and goodness of GOD will be pictured in every study.

The animal, vegetable, and mineral kingdoms will open a rich harvest to their minds; and in the language of the poet, will accustom them to

> "Find tongues in trees, books in the running brooks,
> Sermons in stones, and good in every thing."

Dr. PRIESTLEY remarks, that it is the greatest recommendation of these studies, when they are conducted in a proper manner, that they tend in an eminent degree to promote a *spirit of piety*.

To him, who studies the vegetable creation, or the science of botany, knowledge and amusement will go hand in hand. His *herbarium* will always afford pleasure; and the sexual system of LINNAEUS, being interwoven with the study, will awaken his mind to the contemplation of the order and harmony in the vegetable kingdom.

To him, the book of nature lies constantly open. He reads as he walks along: every field is a new chapter, every leaf is an object of attention, and every flower a prize.*

Mineralogy, which treats of the mineral kingdom, will also contribute to pleasure and profit; and in the arrangement of his cabinet, he will find, that although the specimens are inanimate, they are susceptible of a regular order, agreeably to the WERNERIAN system of classification.†

Zoology, which embraces the animal kingdom from man down to the class of Zoophytes or plant-animals, will present to his view a science no less diversived than useful.

How pleasing and instructive, how sublime and magnificent, is the study of animated nature!‡

The contemplation of creation would prove fruitless, did it not lead us to aspire incessantly after the DIVINE BEING, who has raised up men whose sublime genius explores their beauties, and who become their interpreters.

It is not a part of society, but the whole, or ought to be, that is interested in science; for, on the other hand, well grounded philosophy is the parent of arts, commerce, and agriculture, which are the vital principles that promote the well-being of civilized states: Nor is it less efficacious in fixing the principles of religion.

That knowledge, which is acquired in the school of INFINITE WISDOM, far excels in value the seven times refined silver of Parvaim, or the gold from Ophir and Uphaz. Let us, therefore, conclude by offering such reflections as are adapted to this all-important subject, and, while we add with Lord BACON that "knowledge is power," may we be the more and more impressed with these principles.

Thirdly. The philosopher who neglects the traces of an all-governing deity, in the contemplation of nature, and contents himself with the appearances only of the material universe, and of the mechanical laws of motion, neglects what is most excellent; and prefers what is imperfect to what is supremely perfect, finitude to infinity; what is narrow and weak to what is unlimited and almighty, and what is perishing to what endures forever. Those, who do not attend to the manifest indications of supreme wisdom and goodness perpetually appearing before them, wherever they turn their views or enquiries, too much resemble those ancient philosophers who made night matter, and chaos the original of all things.

* See note 21. † See note 22. ‡ See note 23

When we view the galaxy of illustrious characters, who have lived not for themselves, but for fellow man, who have been workers in the vineyard of religion, virtue, and science, ought it not to awaken the liveliest feelings of our hearts! There are men, whose fame will live forever: these are the benefactors of mankind: their glory will embrace all the future generations of men. Who can stop the progress of their works! What can check the progress of truth! As soon might man stretch forth his feeble arm, and say to yon bright orb of day, retire and cease to shine. While human nature is cemented by every social duty, while the whole human family are linked together, and ever have been from ADAM to the present day, may these truths shine in the constellation of virtues, and be indellibly stamped on the tablet of our hearts!

Although it is said, that we are imprisoned for a while in a small obscure planet only to enjoy such a portion of light as is suitable to our present condition, and that we should wisely improve each glimmering ray; yet a time will come, and the wisest know not how soon, when we must draw all light from the eternal source of light; and instead of contemplating the DIVINE ARCHITECT in the works of his hand, we shall then contemplate the workmanship in the omnipotent author thereof!

How interesting would the sight be! How agreeably would our curiosity be flattered, were we permitted to penetrate into the first principles of nature! A new world would disclose itself to our view; nature, then become tranparent, would no longer conceal her ways from us. Her LABORATORIES and WORKSHOPS would then be thrown open. Here we should see her collecting the principles of metals; there behold her preparing the colour of the rose. Farther we might trace her footsteps into the wonders of light and electricity. In other places, we should observe her sketching the outlines of a plant and animal.*

With respect to the power of GOD, as manifested in all HIS works, it is in the heavens that it still seems to beam forth in its greatest lustre.

By HIS power acting there, HE directs the revolutions of the planets, determines the circumstances of their motions, and fixes the times of their revolutions. As a general at the head of an army, HE gives the signal to the heavenly bodies, and immediately they shoot forth, and proceed in their proper orbits. It is in consequence of the laws laid down by HIM, that the moon goes round the earth in a month.

> For this the moon, thro' heaven's blue concave glides,
> And into motion charms th' expanding tides;
> While earth impetuous round her axle rolls,
> Exalts her wat'ry zone, and sinks the poles. FALCONER.

* See note 12.

It is HE that has combined the two motions of the earth, one by which we obtain the vicissitudes of day and night; the other by which the seasons of the year are brought about. HE it is, who, at the appointed times, sends salutary winds and fruitful rains; who gathers together the waters in their sources, and causes them to flow from thence in the beds of the rivers to their great receptacle, the sea. It is HE who makes the buds to open, the fruits to ripen, and ordering all things according to their different nature; regulating their birth, their growth, and their dissolution.

The whole universe conspires to celebrate HIS praise, from whom it derives all its majesty and beauty. The sun, that shines in brightness declares the ineffable splendour of its ALMIGHTY CREATOR. The moon and stars proclaim to an understanding heart, the adorable power of the HAND that guides them. The earth, so richly stocked with productions of higher and lower rank, with the various kinds of vegetable and animal life, paint in strongest terms the riches of the DIVINE NATURE, from whom issues all that adorns the earth, improves the mind, and delights the senses; governing all things with infinite wisdom, goodness unlimited, power uncontroled.*

"O Lord! how manifold are all thy works, in wisdom thou hast made them all; the earth is full of thy riches."†

"Hearken unto this, O! man. Stand still and consider the wonderous works of GOD."‡

The book of nature, whose pages contain an inexhaustible fund of matter, is replete with lessons of instruction, both moral and physical. While it shews the *extent* of HIS works, the *wisdom* and *riches* of the DIVINE MIND, together with the *wondrous works* of CREATIVE POWER, it proves that the laws of GOD are coeval with creation, and coexistent with INFINITE WISDOM,

Before revolving years began,
The whole Creation's glorious plan,
ALMIGHTY WISDOM laid;
But till the appointed time should pass,
A void, deform, chaotic mass,
The Universe was made. CLAY.

"We feel," says Bishop WATSON, "the interference of the deity every where, but we cannot apprehend the *nature* of his agency any where. A blade of grass cannot spring up, a drop of water cannot fall, a ray of light cannot be emitted from the sun, nor a particle of salt be united, with a never failing symmetry, to its fellow, without him; every secondary cause we discover, is but a new proof of the necessity we are under of ultimately recurring to him as the one primary cause of every thing."

* Adams. † Psalms. ‡ Job. § See note 11.

Well might a writer of antiquity assert, that "GOD saw every thing that he had made, and behold it was very good."

The contemplation of nature drawn from the study of science, is, it is true, governed by the volition. "Every man," says PALEY, "has a particular train of thought into which his mind falls, when at liesure, from the impressions and ideas that occasionally excite it; and if one train of thinking be more desirable than another, it is surely that which regards the phenomena of nature with a constant reference to a supreme intelligent author."

"To me be NATURE'S volume broad displayed,
And to peruse its all-instructing page,
My sole delight."

In contemplating the works of creation, or studying the inventions of art, let us never forget the divine source from which they proceed; and thus, every acquisition of knowledge, will prove a lesson of piety and virtue.

The liberal arts by THEE designed
To polish, comfort, aid, mankind,
We labor to improve.
While we adore JEHOVAH'S name,
Pour on our hearts THY melting flame,
And mould our souls to love! NICHOLS.

Finally, We flatter ourselves that we have shewn, that elementary and transcendent education, properly so called, should consist in impressing sensations on the minds of youth: that metaphysical reasoning enlarges our perceptions of abstract things, and the attributes of DEITY; and that physical reasoning relates to material universe, and the laws by which it is governed.

How important, therefore, is learning in every shape....in promoting our happines, in adding to the general welfare of society, and, above all, in affording exalted ideas of the great I AM, whose perfections are coexistent with creative power.

As in the mechanic powers (the lever, the wheel, the axle, the pulley, the inclined plane, the wedge, the screw) by which man is enabled to raise great weights, and overcome great resistances, so education has the advantage of overcoming our prejudices, and giving reason the superiority over the passions.

Or, as the chemist who subjects bodies to the action of agents, in order to compose and decompose, so the mind when submitted to the operations of a proper education, is fitted and prepared for a variety of states, and conditions in life.

Or, as the natural philosopher, who examines the properties and effects of the material universe; or, as the astronomer, who determines the revolutions of the planets, their distances, and other celestial phenomina; or, as the mathematician, who tests truth by the power of numbers, so education in its every sense produces a thousand advantages, and far excels the delusive dreams of the imagination.

Education is not an Egyptian mystery, a Phœnician maxim, a Pythagorean secret, or a Druidical rite, but it is the art of FORMING AND MANAGING THE MIND. Its principles are pure: Its effect universal, not confined to any nation, tongue, or language.

The senses, we have said, are to be considered as the gifts of nature, and the primary regulators of our active powers; as by them alone we are conscious of the distance, nature, and properties of external objects. The five senses, namely, hearing, seeing, feeling, smelling, tasting, are indeed pre-eminent.* Reason properly employed confirms the documents of nature, which are always true and wholesome; she distinguishes the good from the bad; rejects the last with modesty, and adheres to the first with reverence.

In truth, in the testimony of nature given by the senses, as well as in human testimony given by information, things are signified by signs. In one as well as the other, the mind, either by original principles or by custom, passes from the sign to the conception, and belief of the thing signified.

The inconceivable wisdom of an ALMIGHTY BEING is displayed in the structure of the mind, which extends its power over every branch of science; and the better we understand the nature and use of the faculties, their defects and disorders, we shall apply them with the greater success.

We have shewn, that on the mind all our knowledge must depend. Although by anatomical dissection and observation, we may become acquainted with the body, it is by the anatomy of the mind alone we can discover its powers and principles.

Was it the survey of nature, and the observations of her beautiful proportions, symmetry, and order, that first determined man to imitate the divine plan, and plant society and social duties under the vine and fig tree? The transcendent goodness of the ALMIGHTY FIAT is every where distributed. When we bring within the focus of the eye the variegated carpet of the terrestrial creation, and survey the progress of the vegetative system, our admiration is justly excited! When we extend our views to the animal creation, and contemplate the varied clothing of every species, we are equally struck with astonishment! When we trace the lines of the DIVINE PENCIL in the beautiful plumage of the feathered tribe, how exalted is our conception of heavenly work! When we descend into the bowels of the earth, and explore the mineral kingdom, every mineral will proclaim the handy work of an ALMIGHTY CREATOR! When we survey the watery element, with all the inhabitants of the mighty ocean, the same SUPREME INTELLIGENCE is marked! When we exalt our views to the more noble and elevated parts of nature, and survey the celestial orbs, HIS wisdom shines with renewed lustre!

* See note 2*.

"Let all the people of the earth know THY name and fear THEE," says SOLOMON, in his invocation to GOD.

Man is a *microcosm*, or a world in miniature.* Man is a *laboratory*,† in which various chemical operations take place. Man is a *machine*, in which the *mechanic powers* perform the most important functions‡. Like a *plant* he springeth up,§ Like a *mineral*, of *clay he was formed*¶. As the dissolution of man occasions his decomposition, so the separation of the *elementary principles*, or constituent parts is a law of nature, and confirms the Scripture "that to dust he must return."

However exalted the character of man may be, let him humble himself and ask, what are all the externals of majesty, the pride of wealth, or charms of beauty, when nature has paid her just debt? View life stript of her ornaments, and exposed in her natural simplicity. In the grave all fallacies are detected, all ranks are levelled, all distinctions are done away.

"Canst thou bind the sweet influences of the *Pleiades*, or loose the bands of *Orion***?" No. Canst thou stop the solar, stellar, and lunar motions? No. Proud short-sighted mortal! Humble thyself in the "dust and ashes," and on the bended knee implore the benediction of ALMIGHTY GOD. Engrave not in hieroglyphical signs, in typical figures, or in allegorical emblems; but let your *life in every part*, as *Socrates* says, *be beautiful as an image*, your *translation* through this vale of tears, be worthy of imitation, and written in *legible* characters on the TABLET OF ETERNAL TRUTH,

What is moral truth that we regard it! What is religion that it is as sweet as the honey of mount Hybla, or as healing as as the balm of Gilead! What is wisdom that we court her charms, and admire her graces! What is virtue, the hand maid of moral truth, that it is so dear in our affections! What is happiness, that we desire her presence! What, indeed, are all the pleasures of life, the enjoyments of the mind, and the gratifications of the body, if that *spiritual commerce* with God is cut off! They sink into oblivion; they vanish as a shadow! What are moral, civil and political institutions, if they are not the *true* medium in which intellect operates to systematize chaos, or change contingency to order! If I sow wheat, do I reap apples? If I plough my ground, does that produce a habitation! Therefore, as causes can produce nothing but direct consequences, it is evident that every institution is a medium in which an effect is the result of order, and the effect productive of some end. As upon the economy of the memory depends, in a great measure, the strength or weakness of the intellect, so upon the economy of man in his various relations, depends his happiness, and the contrary. Such, therefore, is the intimate relation between happiness, and mental improvement.

* See note 1. † See note 2. ‡ See note 3. § See note 4.
¶ See note 5. ** JOB.

May that EAGLE* ever be the emblem of our national character: with her wings expanded, may she protect our civil and religious rights....with her tallons open, may she display our wisdom and power; wisdom, in presenting a peace-offering unto all the nations of the earth; and power, in showing that our rights are sacred, not to be insulted with impunity.

May that ARCH† be emblematical of the arch of heaven; and the pillars of the Corinthian order, by which it is supported, be like the maintenance to our globe! In *wisdom* it was formed; in *strength* it is preserved!‡

May that BURNT OFFERING§ be allegorical of the incense of piety offered up on the altar of our conscience; which, though imitative of ancient worship, is emblematical of that adoration we owe to the FIRST of beings! HIM first, HIM midst, HIM last, HIM without end!‖

May the language of JOB inspire the lover of nature: Ask now the beasts, and they shall teach thee; and the fowls of the air, and they shall teach thee; or speak to the earth and it shall teach thee; and the fishes of the sea shall declare it unto thee.¶

May the amateur sympathise with every object around him! May universities, colleges, seminaries, diffuse their salutary influence on the genius and disposition of the people!

May OUR schools of wisdom be schools of virtue; and may OUR TEMPLES of learning, dedicated to OUR GOD, be sacred to the memory of OUR patriotic and benevolent countrymen! May posterity quote the zealous and praiseworthy of this our day, for parallels and example! And may all the institutions of learning remain on the record of time, as so many monuments of human industry, to perpetuate the era of intellectual light!

How sublime are all the faculties of the mind, thoughts that wing infinity; apprehensions that reach through eternity; a fancy that creates; an imagination that contains a universe; wishes that a world hath not wherewithal to satisfy; desires that know neither end nor bound! It is endued by THEE with divine prerogatives, invested with spiritual powers, and enabled ardently to aspire after the felicities of heaven.

May we be the more and more convinced, that as industry is the wealth of a nation, so knowledge is the wealth of the mind. Like a spectator in entering a palace, who examines the different apartments, their symmetry and decorations, so the philosopher in

* The carved eagle, which supports the sounding dome of the pulpit.

† The arch, which is decorated in a superior style, with ornamental carving, supported by two fluted columns of the Corinthian order.

‡ See note 6.

§ The emblems in the form of an urn, which serve as ornaments on the chapiters of the pilasters.

‖ See note 7. ¶ See note 20.

contemplating the building erected by the Almighty architect, views the apartments, their beauty, and the several ends for which they were designed.

Lastly. If we, as a people, possess so many advantages, interwoven with the constitution of our beloved country, let us appreciate their value. And, while our land floweth with milk and honey, may the din of arms never be heard! May thousands and tens of thousands sow, as the husbandmen of old, in fertile ground, and reap the benefits of peace, liberty, and knowledge! May the corn of nourishment, the wine of refreshment, and the oil of joy, stimulate us in works of wisdom, charity, and benevolence! May HE who holds the sceptre, who fixes the destinies of nations, so implant in our bosoms these important truths, that we may become co-workers in the vineyard of VIRTUE and SCIENCE, ever bearing in mind the inestimable gifts of GOD to man. And when these pleasing recollections shall have passed away, may we, one and all, be translated to that TEMPLE of perfection, of supreme felicity, not made with hands, eternal in the heavens!

NOTES.

1. *MAN, a world in miniature.* It is said, that man unites in himself all the powers and qualities which are scattered throughout nature.

2. *Man, a laboratory.* It has been clearly shewn that various processes are constantly going forward in the human system, dependent on the operation of chemical affinities. The conversion of various kinds of food into blood, a fluid of comparatively uniform composition and qualities; the production of animal heat by the action of air on that fluid, as it passes through the lungs; and the changes which the blood afterwards undergoes in its course through the body,....are all, exclusively, subjects of chemical inquiry.

3. *Man, a machine.* The animal body may be regarded as a machine, obeying the same laws of motion as are daily exemplified in the productions of human art. Man has been considered by anatomists, as a *system* of all the artificial machines united in the human fabric; they have found the lever, the pulley, the axle in the wheel, the wedge, and even the screw, or at least something resembling each of them in his person: thus his arms have been compared to levers; the head to a wheel turning on its axle; the diagrastic muscle, that assists his swallowing, to a rope running over its pulley; the glands as lifting up their fluids in the manner of an artificial water screw; and his teeth have been compared to wedges.

The inconceivable power of the muscles, which are supported by the bones, has been exemplified by LA HIRE and DESAGULIERS in one or two remarkable instances. The one of a man, who supported a cannon of four thousand weight. The porters of Constantinople are known to carry each a weight of nine hundred pounds; they lean upon a staff while loaded, and are unloaded in the same manner.

There are many surprising feats of *strong men* that have come under observation; some of which have occurred in this city.

4. *Man springeth up like a plant.* The growth of the body may be compared to the growth of a plant: hence man is said to possess *vegetative* life. On the *economy of vegetables*, see professor BARTON'S Elements of Botany.

5. *Like a mineral, of clay he was formed.* This allusion to a mineral, though figurative is literally true. There are several passages of Scripture which speak of man being formed of the dust of the earth. The LORD GOD formed man of the *dust* of the earth, *Genesis*, ii. 7.

The creation of man, is alone sufficient to excite our admiration; we are lost and bewildered in our contemplations. Chemists have discovered in man, and in other creatures, acids, alkalies, earths, metals, besides other substances.

We are struck with astonishment when it is considered, that the reciprocal action of the solids upon the fluids, is the cause of life, and this very

action continued is the natural cause of death! Death, the grand *leveller* of human greatness, is followed by other laws, which relate to the decomposition of the body. Here, in the process of putrefaction, the elementary principles arrange themselves in a new order, part of which become gaseous and fly off, another part forming various compound bodies, whilst the residue assumes the state of *mother earth.* Though such is man, as to his earthly covering, yet his *soul* is immortal, and soars to GOD. Hence we are told, that *man is sown corruptible; he will rise incorruptible and glorious.*

Dr. DARWIN pursues the same idea, with respect to chemical decomposition, in the following lines:

Hence, when a monarch or a mushroom dies,
A while extinct the organic matter lies;
But, as a few short hours or years revolve,
Alchemic powers the changing mass dissolve;
Emerging matter from the grave returns,
Feels new desires, with new sensations burns;
With youth's first bloom a finer sense acquires,
And LOVES and PLEASURES fan the rising fires.

It was said of old, that the Creator *weighed* the dust, and *measured* the waters, when he made the world. The first quantity is here still; and though man can gather and scatter, move, mix, and unmix, yet he can destroy nothing: the putrefaction of one thing is a preparation for the being, and the bloom, and the beauty of another. In Ecclesiasticus (xviii. 6.) we have the following expressive words; *As for the wondrous works of the Lord, there may be nothing taken from them, neither may any thing be put unto them, neither the ground of them be found out.*

YOUNG,* TATHAM,† PRINGLE,‡ BACON,§ JONES,¶ HALLEY, WATSON,** DE LUC,†† BOERHAAVE, TUCKER,‡‡ COMYN,§§ HUTTON,¶¶ PRIESTLY,*** and many others could be named, whose writings would afford abundant testimony of the insufficiency of human nature, while they shew that we must ultimately recur to the cause of all causes, and that the *ultimatum* of human knowledge is the *will of God.* Hence man may, in the exercise of his intellectual faculties, discover the proximate, or even some of the remotest causes of many of the phenomena of nature; but, in attempting to ascend from cause to cause; he will soon find his faculties bewildered, and be obliged to resolve all into the *will* of Deity....the great first cause of all things!

Dr. BLACK,††† late professor of chemistry in the university of Edinburgh, justly remarks, that if the affinity of the elementary principles of bodies, were suffered to change or decay, the ocean would have been different in regard to composition at present from future times. The oak, says he, is the same now as it was in ancient days; and the acorn will always produce the same tree, namely, the oak. From this idea, DEMOCRATES asserted that *all things were formed of atoms,* and the Greeks taught, that fire, air, water, and earth, (which they called elementary) gave rise to secondary causes.

The elements, or the first principles of bodies, are indeed so proportioned, that none of them might either predominate or fall deficient. In truth, the destruction of one body, is the preparation for another, for as it is by composition and decomposition that things are brought about, so it is, that

* Essay on the Powers and Mechanism of Nature. † Scale and Chart of Truth, p. 133. ‡ Discourses, &c. § Novum Organum. ¶ Sermons, vol. 2, 92. ** Chemical Essays. †† Lettres Physiques et Morales sur l' Historie de la Terre, p. 109. ‡‡ Light of Nature. §§ Sermons. ¶¶ Geological Tracts. *** Sermons, &c. ††† Black's Chemistry.

the laws of the material universe affect the animate and inanimate according to the circumstances of time, place, situation, and affinity. How supremely perfect is the HAND that guides them! How truly harmonious are the LAWS of GOD! Although we see as through a glass, darkly, yet, for this *glimpse* of celestial goodness, we are indebted to SCIENCE. It is a *key* in the hand of man, placed by Providence to *unlock* the second causes, the action of matter upon matter, and to ameliorate the human heart. Like the Egyptian, when he beheld the Nile periodically overflow it banks, fertilize his land, and then peaceably retire within its proper limits, without examining into the cause, and probably attributing it to their tutelary deities; so man, divested of knowledge, may indeed observe the changes in nature, and draw conclusion upon conclusion, till his mind is bewildered, and at last he gives up the pursuit, for want of method, system, or order, or in other words, for the want of science to direct him.

"The sacred seer, with scientific truth,
In Grecian temples taught the attentive youth
With ceaseless change how restless atoms pass
From life to life, a transmigrating mass;
Whence drew the enlighten'd sage the moral plan,
That man should ever be the friend of man;
Should eye with tenderness all living forms,
His brother emmets, and his sister worms." DARWIN.

Man considered in his present state, seems only sent into the world to propagate his kind. He provides himself a successor, and immediately quits his post to make room for him.

——————————— Hæres,
Hæredem alterius, velut unda supervenit undam. HORACE, Ep. 2.

6. In JOB, xxvi. 11, we read of the *pillars* of the earth. These are metaphorical expressions, that suppose the heavens and the earth to be as an edifice raised by the hand of GOD, and founded upon its base or foundation; which appears from these words in JOB, xxxviii. 4, 5, 6. Where wast thou when I laid the foundations of the earth? Declare if thou hast understanding. The opinion of the ancients respecting the earth, is, that it lay upon a flat, and that the heavens were its extremities.

"When earth's foundation first was laid by the ALMIGHTY ARTIST'S hand," it was then the laws of the universe were established, and order and symmetry displayed the ineffable wisdom of the OMNIPOTENT JEHOVAH; hence it is said, that these pillars *represent wisdom* and *strength*. "Wherefore are the *foundations* thereof fastened, or who laid the *corner stone* thereof." JOB.

"On liquid air, HE bade the *columns* rise,
That *prop* the starry concave of the skies;
Diffus'd the blue expanse from pole to pole,
And spread circumfluent ether round the whole." BLACKLOCK.

Or,

"Its *corner stone* and *arch* still perfect stand,
Nursed by HIS care, and fostered by HIS hand."
MITCHELL'S Eulogium.

7. *Burnt offering.* We read in the sacred writings of several kinds of offering. The Holocaust, or, properly, burnt offering, of the Hebrews, was a peculiar kind of offering. Those that offered oblations of bread or of meal, offered also, oil, incense, salt, and wine. "In all thy offerings, thou shalt offer salt." LEV. ii. 13. Salt being a symbol of friendship. There were also burnt offerings of *incense*, which were burnt in vessels of different shapes. In the book of Kings we read, that SOLOMON *burnt incense* in *high* places, and on the *altar*. Burnt offering, however, is applied where a *sacrifice* was made agreeably to the Hebrew custom.

"The Persians," says HERODOTUS, "reject the use of temples, altars, and statues. The tops of high mountains, are the places chosen for sacrifices."

In most of the christian churches, we find emblematical representations of the kind of which we have spoken; which, independent of serving as ornaments, tend to reverence (if I may be allowed the expression) the primitive worship noticed in the Old Testament.

8. It is true, that the man of reflection may observe the admirable harmony, which constitutes the unity of the universe, and draw from the book of nature, the conviction of a supreme intelligence; yet it is equally true, that if his mind is enlarged by science, if of a particular kind, he will learn the *mutual relation* founded on invariable laws that exist in nature, observe the action of matter upon matter, and be enabled the better to appreciate the wisdom shown in the formation, use and properties of bodies. He will also discover, that however important a knowledge of the material universe might be, if he extended his contemplations to the heavenly bodies, he would find the same supreme intelligence displayed in a greater degree.

"Who can this Field of Miracles survey,
And not with GALEN all in rapture say,
Behold a GOD! adore him, and obey."

BLACKMORE, on the Creation.

The wisest of men cannot pry into the *arcana* of heaven; nor can they divine to-day what to-morrow may bring forth. We can never modify the effective causes, but we may so far determine their action as to draw general conclusions. Hence NEWTON* observes, that "there are agents in nature able to make the particles of bodies stick together by very strong attractions; and it is the business of experimental philosophy to find them out." That bounds have been set to human knowledge, is evident from the language of JOB, (xxxviii. 7.) *Hitherto shalt thou come, but no further; and here shall thy proud waves be stayed.* There have been men, it is true, who have justly received the appellation of *interpreters* of nature; among whom Sir ISAAC NEWTON stands preeminent.†

"Immortal NEWTON thus with eye sublime,
Marked the bright periods of revolving time;
Explored in nature's scenes the effect and cause,
And, charm'd, unravelled all her latent laws."

Our FRANKLIN also, whose philosophic mind was a temple of wisdom in miniature, was another of the bright luminaries of genius.

"His soul a *royal sheet* of *texture* fine,
Impressed by virtue, with a *stamp* divine;
The heavenly author *read* it in the skies,
But *marked* no *errors*, in the fair *revise*." M'ELROY.

Permit me to add, that our city‡ boasts the origin of many illustrious characters, whose literary labours stand high on the pinnacle of fame. Heroes in SCIENCE and in BATTLE,

"The Gods the Saviours of their native land." BARLOW.

9. If we trace the human mind from the cradle to the grave, we are to trace it also through the labyrinths of truth and error, and view education either directly or indirectly in fitting the mind for various occupations. In whatever light man is considered, he is so much the creature of education, that his turn or inclination is directed by an impulse, which fits him either for intellectual or corporeal exercise. Hence the *primary* impulse is followed by the exercise of the mind, if of a *professional* kind, or of the body, if of a *corporeal* nature; and more frequently of the two,

* Principia. † See MACLAURIN'S account of Sir Isaac Newton's discoveries. ‡ See MEASE'S Picture of Philadelphia.

in which both the mind and body are employed Hence it is, that discoveries and improvements have been made in the fine and mechanic arts, in natural and experimental philosophy, in natural history, mechanics, chemistry, &c. Hence it is also, that we see man in the exercise of his daily avocation, or study, animated by desire, or pressed by necessity.

10. With respect to female education, much may indeed be said. It is absurd to suppose, that the fair sex is to be denied the temple of science, and as absurd to imagine, that their mental faculties are not as well calculated for every kind of learning as those of the male. We might as well distrust their charms, as to deny this position! See an interesting work, entitled "*Letters, for Literary ladies,*" and also, the "*Parents Friend.*"

11. A view of ethics or moral philosophy, drawn from nature, though established upon immutable laws, will receive new strength from an intimate union with revealed religion: we have had occasion to remark, that true philosophy is an engine of unlimited power in the hand of man; that this knowledge would illucidate some important subjects, intimately connected with our happiness; and that while it serves as a check to our ambition or pride, it would show, that the *Bible of God* and the book *of Nature* are mutually blended, and mutually prove each other.

Whether Ethics be considered the doctrine of pure morality, as derived from nature or from the Bible, certainly there is no source so pure and wholesome from which it can proceed as from the sacred writings.

12. Nature never designed, that man should penetrate into the first causes, or the first principles. What we call elementary principles may indeed be compound; for those bodies heretofore considered simple, as water, have been discovered to contain two or more elementary parts. But were man educatedin the school, the workshop, the laboratory of nature, his curiosity might be satisfied. "We see" *indeed, as the scripture says,* as "through a glass darkly."

"To torture nature, without a hope, were fruitless." Geologists, among whom Mr. Kirwan stands preeminent, have it is true penetrated the globe, and have established their doctrines for the greater part, on the Mosaic account of creation. *Vide Kirwan's Geology.*

13. In the doctrine of meteorology alone, many interesting facts come under notice. Water, for instance, is carried into the atmosphere either by spontaneous or slow evaporation, which, when it rises to a certain height, is acted upon by the combined attractions of aggregation and electricity; it then assumes the form of clouds; by a nearer approximation, water is formed, which, being of a greater specific gravity than the atmosphere, descends in the form of rain. Sometimes this conversion of aqueous vapour into water takes place near the surface of the earth; hence fogs, &c. are produced: If the water in falling, passes through a colder region (at or below 32 degrees of Fahrenheit) ice is formed, which descends in the state of snow or hail. So that natural philosophy, and indeed all the sciences, are of the highest utility: and are mutually illustrative of the various subjects which they embrace.

******* Water restrained gives birth
To grass and plants, and thickens into earth;
Diffused it rises in a higher sphere,
Dilates its drops, and softens into air:
Those finer parts of air again aspire,
Move into warmth, and brighten into fire:
That fire once more, by denser air oer'come,
And downward forced, in earths capacious womb,
Alters its particles, is fire no more,
But lies metallic dust, or pond'rous ore," PRIOR.

The waters, says *Job* speaking of the effect of frost, are hidden as with a stone; alluding to the formation of ice.

Speaking of the phenomina of nature, the production of rain, &c. BROWNE has given the following elegant lines:

"The whole and every part proclaims
His infinite good-will;
It shines in stars, and flows in streams,
And bursts from every hill.
We view it o'er the spreading plain,
And heavens, which spread more wide;
It drops in gentle showers of rain
And rolls in every tide."

Again, water is considered,

"That chief ingredient in HEAVEN's various works,
Whose flexile genius sparkles in the gem,
Grows firm in oak, and fugitive in wine," ARMSTRONG.

The reader will be amply recompensed by perusing a highly interesting work written by a lady, MRS. CHARLOTTE SMITH, entitled "Observations on the ocean," in which this subject is so ably treated, that it would do honor to sir ISAAC NEWTON himself. Children might be instructed, in the *operations* of nature in this manner:

Thus: What is water? *Ans.* A compound of two elements called oxygen and hydrogen. How is it carried into the atmosphere? *Ans.* By evaporation. How does water become vapour? *Ans.* By uniting with the matter of heat, or caloric. What brings the *particles* into contact, so as to form clouds, and then rain? *Ans.* By the combined attractions of aggregation and electricity. How does the attraction of aggregation operate? *Ans.* By overcoming the *repulsive* force produced by caloric or matter of heat, its constant operation is to *bring* the particles *nearer* each other. How does the electric fluid operate? *Ans.* It acts nearly in the same manner, and is necessary in the formation of clouds, as Dr. FRANKLIN clearly demonstrated. Why does the electric fluid pass through the cloud, frequently from one extremity to the other? *Ans.* In order to restore the equilibrium. Why does *lightning* strike the earth? *Ans.* Because the cloud being overcharged cannot retain the *extra* quantity of electricity, and is therefore necessiated to pass to the earth, and is frequently attracted by houses, barns, &c. Why are *lightning* rods used to preserve dwellings, ships, &c. *Ans.* Because metals are better conductors, and therefore attract the fluid with more energy. Why is a rumbling noise or thunder followed by a flash of lightning? Because in its passage to the earth, a *vacuum* is formed, which is immediately *filled*, with considerable rapidity, by the contiguous air. What is the atmosphere composed of? *Ans.* It is composed, as necessary to its constitution, of two distinct airs or gases. What are these airs. *Ans.* Oxygen gas, and azotic gas. What is oxygen gas? *Ans.* It is vital air, or air necessary for the maintenance of life as well as combustion, and other important processes of nature and *art*. What is azotic air? *Ans.* It is, of it self, injurious to animal life, and is that air which serves principally to dilute the vital air of the atmosphere, so that a just equilibrium may be preserved in many natural processes.

It is obvious, however, that in order to impress on the juvenile mind the knowledge of these subjects, it is essential that the pupil should be acquainted with the sciences. It is not necessary he should have a profound acqaintance with philosophy; but a general outline, as BURG and PRIESTLEY have remarked, will be sufficient to enable him to account for natural and other phenomina.

An interesting description of the *Public Instruction* in France is given in a

work, entitled *Sketches on France*,* originally written in German, 1807, together with an exposition of the system of M. FOURCROY, in which the whole plan of education is so arranged, that the pupils obtain a knowledge of the sciences before their education is completed.

14. The progressive improvement of the mind in the city and vicinity of Philadelphia, is considerably indebted to the LIBRARY, which was instituted many years since under the auspices of that illustrious sage, Dr. FRANKLIN, and has increased in the number of volumes. This added to the Loganian Library, forms a collection to the number it is said of better than twenty thousand volumes, which, I think, were originally divided into three classes, namely, of REASON, MEMORY, and IMAGINATION.

Several institutions of charity, for the education of indigent children, have been established in some parts of the United States, by the Society of Free Masons: and the Grand Lodge of Pennsylvania, have it in contemplation to establish an extensive charity school, on the principle of the one, founded by the Grand Lodge of England. May all such endeavours, built on the broad basis of charity, receive the plaudits of an enlightened people! Nothing can add more to the dignity of the human character, than unbounded charity and love, and the establishment of those institutions which are calculated to ameliorate the human heart.

15. The human mind delights in speculative reasoning. It can scarcely receive two connected facts without wishing to draw a general conclusion. It is this spirit of generalization that has given rise to some of the most sublime, as well as the wildest theories. In truth, that without it, the mind would be nothing better than a wild chaos of facts.

Instead of a well constructed temple, throughout the whole of which reigns the most perfect harmony, it would be a mere quarry, in which although the materials for constructing the temple are contained, yet they are in so rude and degenerated a state that they are neither useful nor elegent. Such, however, is the fact, that whatever system is not founded on truth must fall.

"Although the arguing from phenomina," says Sir ISAAC NEWTON, in his Principia, "be no demonstration of *general* conclusion, yet it is the best way of arguing which the nature of things admits of, and is looked upon as so much the stronger by how much the induction is more general."

To unfold the beauty and harmony of the universe, by a well digested philosophy; to develope a plan of vast extent and of uninterrupted order; to penetrate that MIND, which could only have conceived in perfect wisdom, and executed with unbounded power; are only a few of the effects, which are the immediate result of scientific truth.

16. Since the invention of PRINTING, which may be justly called the "Art that embalms all other arts," mankind have been enabled to transmit unimpaired their knowledge and improvements to posterity.

About the year 1430, a gentleman, by the name of LAURENTIUS, an inhabitant of Harlem, was walking in a wood near the city, and amused himself with cutting letters of the alphabet upon the rind of a beach tree, which, for fancy-sake, he impressed on paper with common writing ink, and printed one or two lines, as a specimen for his grand children to follow. This amusement was practised until he discovered a plan of cutting on pages of wood, the letters and words necessary to convey lessons of science and morality to his young pupils. This appears to be the origin of printing. To the art of printing, says the celebrated Dr. KNOX, the world owes the *reformation*. It has been justly remarked, that if the books of LUTHER had been multiplied only by the slow process of hand writing, they must have been few, and could have been easily suppressed by the combination of wealth and power. But poured forth in abundance from the press, they

* Now in the press of J. & A. Y. Humphreys.

spread over the land with the rapidity of an inundation, which acquired additional force, from the efforts used to obstruct its progress. He who undertook to prevent the dispersion of the books, once issued from the press, attempted a task no less arduous than the destruction of the Hydra. The reformation of LUTHER was truly distinguished as one of the most glorious events, which the discovery of printing produced.

"Could FAUSTUS* live, by gloomy grave resigned,
With power extensive as sublime his mind,
His glorious life a volume would compose,
As *Alps* immortal, spotless as its snows.
The *stars* should be its *types*, its *press* the *age*—
The *earth* its *binding*—and the *sky* its *page;*
In *language* set not *Babel* could o'erturn—
On *leaves* impressed, which Omar could not burn.
The sacred work in Heaven's high dome should stand,
Shine with its suns, and with its arch expand,
Till Nature's self, the Vandal torch should raise,
And the vast Alcove of Creation blaze."

"The invention of letters, as well as the invention of printing, has added considerably to the felicity of mankind. Before the former was known, the human family may be said to have been perpetually in their infancy; as the arts of one age or country died with their inventors." *Botanic Garden; note on Papyra.*

17. Speaking of man, it may not be improper to add, that near six thousand years have elapsed since the creation. At first there were only two human beings. When the flood came upon the earth, which was 1656 years from the beginning of time, these two had increased according to a moderate computation, to the number of 10,734,418,240 persons. From Noah and his family sprung the present race, and are supposed to be only about 950,000,000 persons. See the *Political Arithmetic.*

We ought to remember, that in the great scale of existence, the whole family of mankind are upon a *level* with each other, notwithstanding the necessary subordination in the political compact, which was wisely instituted by our forefathers to preserve order and harmony. Government was instituted to form men into good citizens and subjects, and for mutual protection; for each individual in fact, by the mutual tye, one to another constitutes the nation, the political union. Government in ancient, as well as in modern times, was either monarchical, aristocratical, or democratical. We read in the Bible of kings, elders, rulers, governing provinces, districts, &c. either directly or indirectly; consequently, different forms of government were in existence.

18. When we experience ourselves to produce any effect, it is by volition; *i. e.* by an exercise or act of our will to give it existence, that we do it. All power belongs to mind; or nothing is powerful but a mind, or a principle of intelligence capable of giving existence to certain effects, by its volition that they should be produced. We, ourselves, have power, or call ourselves active in no other sense; and we cannot pronounce any other being active, but in that sense alone. *Turnbull's Moral and Christian Philosophy.*

In Ecclesiasticus, (xvii. 5.) speaking of the *senses*, we are told, *That man received the use of the five operations of the Lord, and in the sixth place he imparted to him understanding, and in the seventh speech, an interpreter of the cogitations thereof.*

"*What the mind speaks,* says the Chaldaic Oracles,† *it speaks by understanding.*"

* To whom some attribute the invention of printing.
† STANLEY'S History of Philosophy.

19. The affairs of the school are managed by a committee consisting of DANIEL BRÆUTIGAM, JOHN GREINER, CHARLES SCHAFFER, and ADAM ECKFELDT. JOHN GOODMAN, ESQ. the president of the society, is the president of the committee.

Mr. BACHMAN, the teacher, deserves much honour for the order and system in the school, which, we are happy to find, has its full complement of scholars. To Mr. BACHMAN the society are indebted for its present flourishing state. The pupils have progressed considerably in their education. The exercise of the mind, in *composition* (which is drawn from certain questions put to them) is particularly attended to, and is productive of many advantages. Premiums are given. The elegant medallions of GENERAL GATES and the taking of BURGOYNE, which are struck on purpose are awarded. It is hoped, that when the plan shall be extended every branch of useful learning will be taught.

Some four or five years since, I wrote an EPITOME of CHEMISTRY, at the request of Mr. GREINER, (whose expanded and liberal mind saw at once the utility of this science) for the use of the school.

Dr. BARTON, professor of Materia Medica, and Natural History, in the University of Pennsylvania, was also engaged in the Botanical department.

Mr. GREINER himself planned a system of education, which embraced the necessary scope of learning, and founded on those immutable laws, so essential *in forming as well as managing the mind* of youth.

Much has been said respecting Mr. LANCASTER's system of education, "His improvements," says a late writer, "are in the cheapness of schools, their activity, their order, and their emulation. A scheme of economy hitherto unprecedented, as he has demonstrated that the annual sum of 300*l.* sterling is an adequate expense for instructing one thousand boys in reading, writing, and arithmetic, by one person."

The Edinburgh Reviewers say, that "a more beautiful, a more orderly, and a more affecting scene, than the school of Mr. LANCASTER, it is not possible to behold. The progress of the children is rapid beyond all belief; and evinces, in the most gratifying manner, the extraordinary effects which are produced upon the human mind by the arts of cultivation."

20. There are several other prominent passages in scripture bespeaking the *handy work* of GOD. In most all the books of the Old and New Testament, we find it written, that the study of creation, (acquired indeed in the school of infinite wisdom,) will afford extensive views of the natural and moral worlds. It is well known, that the ancients adored the sun; hence they termed it the *heart of heaven*. The sun, *to rule and govern by day*, as the Psalmist says, may well have excited their admiration in the contemplation of creative power.

It is thought to be the sun, that the Phœnicians worshipped under the name of *Baal*, the Moabites under the name of *Chemosh*, the Ammonites by that of *Moloch*, and the Israelites by the name of *Baal*, and by the *King of the host of heaven*. They also adored the Moon, whom they called *Astarta*, and the *Queen of heaven*. See *Cruden's Concordance*.

JOB (xxvii. 11.) says, *I will teach you by the hand of God*. Corinthians, xi, 14. *Doth not even nature itself teach you*, &c. Many more passages of the like nature might be adduced, in which this study is pointed out in the strongest terms.

"Certain it is, says Lord BACON, "that GOD worketh nothing in nature but by second causes; and if they would have it otherwise believed, it is mere imposture, as it were in favour towards GOD, and nothing else but to offer to the Author of Truth the unclean sacrifice of a lie."

"There are," continues the same writer, "two books or volumes of study laid before us, if we will be secured from error; first, the Scriptures revealing the will of GOD, and the creatures expressing his power, where-

of the latter is a key to the former; and both written by the finger of the one eternal GOD." See note 11.

21. The species of vegetables already known are more than 40,000, and additions are daily making to this number, by new discoveries. Is it possible, that so bountiful a provision can be made by nature ultimately for the use of man? Yes: "for him she has covered the earth with plants; and though their species be infinite in number, there is not one but may be converted to his use. She has selected some out of every class to minister to his pleasures, or his support, wherever he shall please to fix his habitation. Others serve for his bed, for his roof, for his clothing, for the cure of his disease, and for the fire of his hearth." ST. PIERRE.

"Soft roll your incense, herbs, and fruits, and flowers,
In mingled clouds to HIM, whose sun exalts,
Whose breath perfumes you, and whose pencil paints."

In every study, we are presented with new views: hence THOMSON has the following emphatic lines:

"The philosophic youth
To NATURE'S voice attends, from month to month,
And day to day, through the revolving year;
Admiring, sees her in her *every* shape,
Feels all her sweet emotions at his heart;
While TRUTH divinely breaking on his mind,
Elates his being, and unfolds his powers."

22. The study of mineralogy is indeed extensive; for nature has presented so great a diversity of minerals, arising from the union of the primitive earths, &c., that we behold in the cabinet of the naturalist the number of some thousand specimens. This science has been divided into classes, in the following order:

1. Oryctognosiæ, which comprehends Mineralogy, in particular.
2. Geognosia, which treats of the mode of formation, relative structure as well as the relative position of mineral masses.
3. Mineralogical geography, which describes the geographical position of mineral substances.
4. Mineralogical chemistry makes us acquainted with the kind, quantity, or proportion of mineral substances, as is effected by analysis.

To a cursory observer, the earths appear infinitely diversified; so much so, that he would probably think the different kinds are innumerable. However, notwithstanding the varied appearances of the earth under our feet, of that of the furrows of the field, and of the mountainous parts of the world, whose diversified strata present to our view substances of every texture and of every shade, the whole is only composed of nine primitive earths; and as three of these occur but seldom, the *variety* which is produced by the other *six* becomes the more remarkable. This may fairly be adduced from the infinite skill of the Deity, as it "bespeaks an artist master of his work, acquainted with his materials." To give a still greater variety to the works of nature, these earths are endowed with an affinity for acids and metallic oxides, whence arise the spars, gems, and precious stones of every colour and every species.

"The unfruitful rock, impregn'd by thee,
In dark retirement forms the lucid stone." PARKE.

The celebrated Cornwall mines of England, were known and wrought in the time of Diodorus Siculus, forty years before Christ. For a description of these mines, see professor SILLEMAN'S travels.

Many mineral substances, says PLINY, were known and used by the ancients. In various parts of the Bible we read of stones, gems, metals, &c. Iron was in use in the time of MOSES, Deut. iv. 20, viii. 9. HOMER describes the fire-brand driven into the eye of Polyphemus, as hissing like red hot iron immersed in water:

"And, as when arm'rers temper in the ford
The keen-edged pole-ax, or the shining sword,
The red-hot metal hisses in the lake,
So in his eye-ball hiss'd the plunging stake." *Odyssey*, book ix. 465.

LUCRETIUS alludes to the early use of copper in these words:

Prior æris erat, quam ferri cognitus usus. *Lib.* 5.

The metals are generally found *mineralized* by acids, sulphur, oxygen, &c. forming *ores*.

23. ZOOLOGY. This science, (a branch of natural history,) comprehends the beasts, birds, fishes, insects and reptiles. The most interesting works, adapted to the capacities of youth, which treats on this subject, is, "The Beauties of the Creation," by RILEY. To which may be added, "ANDERSON'S History of Quadrupeds," the "Studies of Nature," by St. PIERRE, GOLDSMITH'S "Animated Nature," BONNET'S "Contemplation of Nature." To the more advanced pupil, TURTON'S LINNÆUS and SHAW'S Zoology will be of inestimable value.

JOYCE'S Scientific Dialogues may also be consulted.

Content of spirit must from science flow;
For 'tis a godlike attribute to know. PRIOR.

24. The great Creator has made an invaluable present of the senses, to be the inlets of innumerable pleasures, and the means of the most valuable advantages.

The *eye* commands the most enlarged prospects. Consisting only of fluids inclosed with coats, it shows us all the graces and glories of nature. How wonderful, that an image of the highest mountains, and the widest landscapes should enter the small pupil! that the rays of light should paint on the optic nerve, paint in an instant of time, paint in their truest colours and exact lineaments, every species of external objects! The *ear* consists of an outward porch and inner rooms. The *hammer* and the *anvil*, the winding labyrinth, and the sounding galleries, these and other pieces of mechanism, all instrumental to hearing, are inexpressibly curious.

Taste is another capacity, which, together with that of *feeling*, have their peculiar properties.

The crowning gift that augments the benefits arising from all the senses, is *speech*, which, it is unnecessary to state, produces innumerable advantages. See an interesting work, entitled *Rapports du Physique et du Moral de l'Homme. Par P. I. G. Cabanis.* See also *Reid on the Intellectual powers of Man.*

ADDENDA.

1. SINCE the preceding pages have been put to press, professor BARTON informs me, that his Principles of Botany, a work calculated for young beginners, (whether male or female) will appear in a month or two. A work of this kind is much wanted. As it is adapted more particularly to the neighbourhood of Philadelphia, where plants of a certain description are common, it will be of more advantage to the amateur of our city. His treatise on Zoology, will also appear in a short time.

2. Having had occasion to introduce the name of Dr. LUTHER, it may not be improper to add, for the information of my readers, that proposals have been issued for publishing by subscription, a striking likeness of the Doctor.

"This work," says the prospectus, "is undertaken by several persons in this city, not from pecuniary motives respecting themselves, they consider it as a tribute due the memory of this illustrious hero of the christian church, and to stimulate men of taste to make themselves acquainted with his history. The services rendered the world by the great reformer, are daily more and more appreciated. In the county of Mansfeld, in Germany, a literary society is at present engaged in collecting the means for raising a suitable monument to his memory. From a small work some time since published at Halle, entitled "*Dr. Martin Luther's Monument, &c.*" the following part of a paragraph is extracted. 'We therefore hereby make known to all venerators of the great Luther, in all parts of the earth, that in the year 1817, we shall erect, on the jubilee day of the reformation in the county of Mansfeld, on an elevated place, a monument, worthy of his greatness and of human gratitude.' And in the same work the following observation is made, respecting the French nation 'The important prize question proposed by the National Institute at Paris, on 'the spirit and influence of the reformation by Luther,' is a loud acknowledgment of his greatness, by the most learned and eminent characters of that nation. And who was it that solved that question? Villers, a catholick, an exiled citizen of that people.' Numerous passages might be quoted from the writings of men in different parts of Europe, who view and acknowledge his merits with an impartial and unprejudiced mind. We may therefore reasonably hope and expect, that in America, where the free investigation of religious truths is the constitutional right and privilege of every individual, encouragement will be given to the advancement of a small tribute of respect, to the memory of the man, who, at the risk and hazard of his life, so much contributed to the establishment of that sacred right.

"The print sixteen by twenty inches, will be delivered about the beginning of May next, at five dollars a copy for the first impression and three dollars fifty cents the second."

The execution and delivery of the work is guaranteed by Messrs. John Goodman, John Greiner, Daniel Brætigam, Isaac Wampole, and Adam Eckfeldt, by whom subscriptions are received.