

generally a smooth and unctuous feel, a greenish cast, a fibrous obstructed texture, and a silky lustre. Among them we may mention talc, stontite, serpentine, chlorite, asbestos, &c. Pure magnesia does not form with water an adhesive ductile mass. It is in the form of a very white spongy powder and perfectly tasteless.

SCIENTIFIC.

HISTORICAL SKETCH OF ASTRONOMY.

Astronomy is a science, which, in all ages and countries flourishing in arts and politeness, has engaged the attention of the speculative and contemplative mind. It has not only employed the tongues of the most eloquent orators, and embellished the writings of men of the most elevated genius; but has also been cultivated by the greatest princes, the ablest statesmen, and the wisest philosophers, whose names have been recorded in history, and whose studies have enriched mankind.

The Astronomer has for the subject of his speculations, the whole universe of material being. He considers the nature of matter in general; and inquires by what laws its several parts act upon one another. But his thoughts are more particularly employed about those vast bodies, which compose the visible phenomena of the heavens, and which, in common speech, are comprehended under the appellation of the *Sun, Moon, and Stars*. He finds the magnitude of these to be vastly greater than is commonly supposed. He is able to demonstrate, that very few of them are so small in bulk as the earth on which we live; and that the greater number far exceed it in dimensions. He is assured, that, in point of real magnitude, the Sun is equal to a million of our globe: and that his apparently diminutive bulk arises solely from that amazing distance which separates him from our planetary habitation. He discovers that there are several other planets, some of them much larger than ours, which receive light and heat from the Sun; which are carried round him with prodigious velocities; and which may probably be inhabited by various creatures, both rational and irrational. He knows that the Stars, which seem to be so near to each other in the firmament, are at inconceivable distances from one another, as well as from us; and that, how small soever they appear, they are in reality enormous bodies, many of them not inferior to the Sun in magnitude. His glasses show him a prodigious number of stars, which, by reason of their vast distances from us, are invisible to the unassisted eye; and the better his glasses are, the greater is the number of stars thus discovered. Hence he reasonably concludes, that there are innumerable multitudes scattered through the immensity of space, beyond the reach of any magnifying powers that have hitherto been invented.

It is an observation of a philosopher, that mathematical sciences have a tendency to purify the soul. The active principle within us must have some employment. If it be delighted with abstruse speculations, it will be less attached to sensual pleasures; but if we go no farther, we fall very short of acting up to the dignity of a rational nature. In order to attain this, we must carry our contemplations of the frame and constitution of the universe to their proper mark; that, from beholding the wonders of the creation, we may be brought to adore the wisdom, power, and goodness, of the Creator. There is, indeed, no part of the creation which does not display these attributes to an attentive mind; but the heavens, in a more eminent manner, declare the glory of God, and the firmament sheweth his handy-work.

HISTORY OF ASTRONOMY.

Astronomy is a science of such great antiquity, that some of its first principles must have been known from the beginning of the world. The rising and setting of the Sun; the variations in his altitude, in the same country, in different seasons of the year, and the distinct degrees of heat he communicates,—the changes in the face of the Moon, and their periodical returns,—the vast expanse of heaven diversified with a prodigious number of stars of different magnitudes,—and the apparent diurnal motion of the heavenly bodies,—are all such striking objects, as must have drawn the attention, and excited the admiration, of all reasonable beings, long before observation gave birth to science.

Some single stars, such as Sirius, Capella, Alderamin, and others of the first magnitude, some constellations or groups of stars, such as the Great Bear, Orion, Arcturus, and the Pleiades; are so remarkable, as to be easily distinguished from the rest. Besides the fixed stars, the planets, by their different degrees of brightness and colour, but especially by changing their places, must soon have been the objects of general attention. When the lives of men were protracted to eight or nine hundred years, as in the antediluvian ages of the world, (Gen. chap. v.) one man might observe Saturn, the slowest of the planets, go through more than twenty of his periodical revolutions round the Sun. It is therefore but reasonable to suppose, that some of the antediluvians might have been tolerably good astronomers. But it is to be lamented, that if they had any written accounts of astronomical observations, or any other acquaintance with useful arts or sciences, the far greatest part of them must have perished in the general deluge, since few fragments only of their acquirements have been transmitted to posterity.

Josephus says, that God indulged the antediluvians with a long life, that they might bring astronomy and geometry to perfection; that the first of these could not be learned in less than 600 years; "for that period" says he, "is the grand year." By this it is supposed, that he meant the period in which the Sun and Moon come again into the same situation in which they were at the creation, with regard to the nodes and apogee of the Moon. "This period," says Cassini, "whereof we find no intimation in any monument of any other nation, is the finest period that ever was invented; for it brings out the solar year more exactly than that of Hipparchus and Ptolemy; and fixes the lunar month within about one second of what it is determined by modern astronomers." If the antediluvians had in reality such a period of 600 years, it is certain that they must have known the motions of the Sun and Moon more exactly than they were known during some ages after the flood.

Pliny says of Hipparchus, that "he published an account of the motions of the Sun and Moon for 600 years to come." This makes it probable, that this industrious astronomer had the knowledge of the period in question, and gave an account of eclipses for 600 future years; which could not be done without tables, unless they had something equivalent, such as the Indian numbers, brought from Siam by Loubere and explained by Don. Cassini, in the *Règles d'Astronomie Indienne, pour calculer les Mouvements du Soleil, et de la Lune, expliquées*.

[TO BE CONTINUED.]

MISCELLANY.

THE FOLLY OF MISPENDING TIME.

An ancient poet, unreasonably discontented at the present state of things, which his system of opinions obliged him to represent in its worst form, has observed of the earth, "That its greater part is covered by the uninhabitable ocean; that of the rest, some is encumbered with naked mountains, and some lost under barren sands; some scorched with unintermitted heat, and petrified with perpetual frost; so that only a few regions remain for the production of fruits, the pasture of cattle, and the accommodation of man."

The same observation may be transferred to the time allotted us in our present state. When we have deducted all that is absorbed in sleep, all that is inevitably appropriated to the demands of nature, or irresistibly engrossed by the tyranny of custom; all that passes in regulating the superficial decorations of life, or is given up in the reciprocations of civility to the disposal of others; all that is torn from us by the violence of disease, or stolen imperceptibly away by lassitude and languor; we shall find that part of our duration very small of which we can truly call ourselves masters, or which we can spend wholly at our own choice. Many of our hours are lost in a rotation of petty cares, in a constant recurrence of the same employments; many of our provisions for ease, or happiness are always exhausted by the present day; and a great part of our existence serves no other purpose than that of enabling us to enjoy the rest.

Of the few moments which are left in our disposal, it may reasonably be expected, that we should be so frugal, as to let none of them slip from us without some equivalent, and perhaps it might be found, that as the earth, however straitened by rocks and waters, is capable of producing more than all its inhabitants are able to consume, our lives, though much contracted by incidental distraction, would yet afford us a large space vacant to the exercise of talents and virtue; that we want not time, but diligence, for great performances; and that we squander much of our allowance, even while we think it sparing and insufficient.

This natural and necessary comminution of our lives, perhaps, often makes us sensible of the negligence with which we suffer them to slide away. We never consider ourselves as possessed at once of time sufficient for any great design, and therefore indulge ourselves in fortuitous amusements. We think it unnecessary to take an account of a few supernumerary moments, which, however employed, could have produced little advantage, and which were exposed to a thousand chances of disturbance and interruption.

It is observable, that, either by nature or by habit, our faculties are fitted to images of a certain extent, to which we adjust great things by division, and little things by accumulation. Of extensive surfaces we can only take a survey, as the parts succeed one another; and atoms we cannot perceive, till they are united into masses. Thus we break the vast periods of time into centuries and years; and thus, if we would know the amount of moments, we must agglomerate them into days and weeks.

The proverbial frailties of our parsimonious ancestors have informed us, that the fatal waste of fortune is by small expenses, by the profusion of sum too little singly to alarm our caution, and which we never suffer ourselves to consider together. Of the same kind is the prodigality of life; he that hopes to look back hereafter with satisfaction upon past years, must learn to know the present value of single minutes, and endeavour to let no particle of time fall useless to the ground.

It is usual for those who are advised to the attainment of any new qualifications, to look upon themselves as required to change the general course of their conduct, to dismiss their business, and exclude pleasure, and to devote their days or nights to a particular attention. But all common degrees of excellence are attainable at a lesser price; he that should steadily and resolutely assign to any science or language those interstitial vacancies, which intervene in the most crowded variety of diversion or employment, would find every day new irradiations of knowledge, and discover how much more, is to be hoped from frequency and perseverance than from violent efforts and sudden desirings, which are soon remitted when they encounter difficulty, and desires which, if they are indulged too often, will shake off the authority of reason, and range capriciously from one object to another.

The disposition to defer every important design to a time of leisure, and a state of settled uniformity, proceeds generally from a false estimate of the human powers. If we except those gigantic and stupendous intelligences who are said to grasp a system by intuition, and bound forward from one series of conclusions to another, without regular steps through intermediate propositions, the most successful students make their advances in knowledge by short sprints, between each of which the mind may lie at rest. For every single act of progression a short time is sufficient; and it is only necessary, that whenever that time is afforded it will be well employed.

Few minds will be long confined to severe and laborious meditation; and when a successful attack on knowledge has been made, the student recreates himself with the contemplation of his conquest, and forbears another incursion till the new-acquired truth has become familiar, and his curiosity calls upon him for fresh gratifications. Whether the time of intermission is spent in company or in solitude, in necessary business or in voluntary levities, the understanding is equally abstracted from the object of inquiry; but, perhaps, if it be detained by occupations less pleasing, it returns again to study with greater alacrity than when it is glutted with equal pleasures, and surfeited with intemperance of application. He that will not suffer himself to be discouraged by fancied impossibilities, may, sometimes