

designate is one which comprehends a great variety of subjects, and a vast range of study and investigation. It is closely connected with many other branches of knowledge, as astronomy, geology, meteorology and history, which properly speaking, are only subdivisions of this grand division of human study. This science brings under our consideration everything connected with the planet which has been destined as our abode. Although the word geography, in its more common application, is regarded merely as descriptive of that knowledge which renders us conversant with the lines by which it has been found necessary to distinguish the artificial representations of the globe, the various features of land and water, mountains and rivers, and the respective situations of countries and cities; it no less strictly embraces the shape, motions, and extent of the globe; the phenomena of the atmosphere and ocean; the nature of soils; the animals and vegetables which they maintain; and the manner, character, condition, and history of the inhabitants of the earth.

Our present object is rather to give a general outline of the leading parts of the subject than minutely to investigate any of its particular divisions; to present such a view of the whole as may render an ordinary mind familiar with the sublime facts which have been unfolded by the researches of science, and to note the indications of wisdom and benevolence which abound in the wonderful works of God. It seems proper, therefore, to begin with the atmosphere, that gaseous ocean which envelops our globe, and performs so many important purposes in the economy of nature. It was supposed by the ancients to constitute two of the four elements, of which, according to them, all things were composed. This opinion was rendered doubtful by the experiments of Boyle and other chemists. The discovery of oxygen gas, by Priestley, in 1774, confirmed the doubts which had formerly arisen, and paved the way for its entire overthrow. It has now been proved by a series of experiments, conducted with scientific care, that common air is composed of oxygen and nitrogen, in the proportion, by measure, of twenty parts of oxygen and eighty of nitrogen. It is also ascertained that its composition is the same at all times and in all places, on the summit of the highest mountain, and in the lowest valley; in the most salubrious clime and in the most pestilential alley. It is, therefore a curious question, whether the atmosphere reaches to an unlimited extent, and pervades all space, or is confined within definite limits to the planet which we inhabit. It has been inferred from astronomical observations, that there is no such atmosphere round the sun or Jupiter, and hence it is concluded that it is peculiar to the earth, and confined within a certain range. There is no means of determining its exact height. The only way of reaching an approximate result is by observations connected with twilight. This is caused by the refraction and reflection of the rays of light which proceed from the sun, and generally continue about half an hour. If the atmosphere extended indefinitely, we would not experience the alternations of night and day, as night would be distinguished from day only by a fainter light.

The sun's rays would in all situations fall upon some part of the atmosphere, and be reflected in all directions, consequently some light would always reach the earth. Since this is not the case, it is inferred that the atmosphere is of limited extent; and by careful investigation, founded on the laws of refraction and reflection, scientific men have concluded that it extends only about forty-six miles.

One of the most important properties of atmospheric air is its elasticity, from which it derives several other qualities. It is now ascertained that the air is extremely compressible, and that, like all other gaseous bodies, its volume is inversely as the pressure. If, for instance, a quantity of air occupy 100 measures under a pressure of 1 lb., according to this law it would occupy 50 under 2 lb., and 200 under 1/2 lb. By the experiments of Oersted, performed in 1825, it was demonstrated that this law applies even in the case of very great pressure, as he exposed common air to a pressure of 110 atmospheres. It therefore appears that atmospheric air is extremely elastic. From this peculiarity in its constitution results the difference in its density. It is evident, from its compressibility, that the air near the surface of the earth must be denser than in the higher regions, as it is compressed by the superincumbent mass, and that its density must be diminished in proportion to its distance from the earth. The pressure of the atmosphere was first noticed early in the seventeenth century by Galileo, and afterwards demonstrated by his pupil Torricelli. Before his time, it had been observed that when air was sucked out of a small glass tube, the water immediately ascended and filled the tube. Of this no philosophical account could be given, and it was therefore concluded that nature abhorred a vacuum. On this presumption pumps were constructed for raising water by means of a vacuum. An attempt was made at Florence, in 1661, to raise water in a pump to a height of more than thirty-four feet, and as it proved ineffectual, the prevalent notion then was that nature had no abhorrence of a vacuum above that height. This, however, did not satisfy Torricelli, and by a variety of experiments, he made it manifest that the air has a pressure, and discarded the notion of nature's abhorring a vacuum. The pressure at the level of the sea is 15 lb. on every square inch of surface, and is capable of supporting a column of water 34 feet, and of mercury 30 inches in height. As the pressure on every inch of the earth's surface is 15 lb., by multiplying the number of square inches on

the surface of the earth by 15, the whole weight of the atmosphere is found to be 15,000,000,000,000 tons.

It has been found by those who have ascended to a great elevation, owing to that tenacity of the air, great exhaustion is experienced on the slightest muscular exertion. Wood, when on the 'Roof of the World,' in Pamir, found that half a dozen strokes with a hatchet so exhausted the workmen that they fell to the ground, that a run of 50 yards makes the runner gasp for breath, that the voice was sensibly affected, and that conversation in a loud tone exhausted the speaker. Saussan experienced the same effect when on Mont Blanc, and his party were effected with dizziness, headaches, loss of appetite and burning thirst. When Humboldt attempted to ascend Chimborazo, and had nearly reached its summit, he desisted on finding that drops of blood issued from under his nails and eyelids.

The density of the air in some degree affects the temperature. The atmosphere, like all gaseous bodies, permits radiant matter, as heat, to pass through it, without being absorbed, and, consequently, is not heated by it. Hence it follows, that the air is not heated by the transmission of the sun's rays. The heat which passes through it is absorbed by the earth, and heats the air chiefly by contact. From this it is evident, that though the air at all altitudes were of equal density, the higher strata being farther removed from the surface of the earth, must be colder than those nearer its surface. In addition to this, the degree of heat is almost diminished by the tenacity of the air, as the more air is rarefied, the greater is its specific heat. The meaning of this is, that a quantity of rarefied air would not be raised by any degree of heat to the same temperature as the same quantity of denser air by the same degree of heat. By the combined influence of these two causes, it follows, that the higher we ascend in any particular place, the colder it becomes; and it has been determined, that the temperature diminishes at the rate of one degree for every 352 feet. Accordingly, in all latitudes, there is a certain height when water no longer retains its liquid state but turns into ice, and snow into vapour. This is called the snow-line, or line of perpetual congelation. It is not, however, of a uniform height, but varies according to the inclination of the sun's rays, being highest within the tropics, and gradually diminishing towards the poles. At the equator the snow-line is found at an elevation of about 19,000 feet; at forty-five degrees of latitude it descends to 9000 feet, and at eighty degrees it reaches the surface of the earth.

It thus appears that within eighty degrees on each side of the equator, is the space designed as the abode of animal and vegetable life; as beyond that, animals do not live or plants grow—all is a dreary waste. Mountains of snow and rocks of ice, piled in terrific grandeur, awe the mind, and impress it with a sense of utter desolation. These snow-capped monuments of Omnipotence, whose foundations are in the earth, and whose summits seem lost in the expanse of the firmament, though apparently useless, perform important purposes in the operations of nature. They are the exhaustless reservoirs which supply the rolling rivers that irrigate the scorched plains of the tropics. Without these, the refreshing and fertilizing waters of the Amazon and Ganges would cease to flow, and to diffuse luxuriance by the sweep of their ample bosoms. A constant current of cold air rushes from these bleak regions, bearing health and energy to the faint and sickly inhabitants of sultry climes, and producing these winds which waft our ships from shore to shore. Thus, what at first seems a region of cheerless horror, another lumber-house of nature, appears to be rendered subservient to the benevolent purposes of the architect of the universe, in facilitating the commerce of nations, and transporting from clime to clime.

#### From Tait's Edinburgh Magazine. THE TYRANT'S TOMB.

It was a well-known doctrine of the ancient Egyptians, that the soul after death passed through the forms of various animals for a period of three thousand years, at the end of which time it resumed its original habitation. As, however, their ideas of a resurrection went no further than the re-animation of the body, if existing, it became a point of supreme importance that it should be preserved during this interval, as well from the decay of nature, as from the many accidents to which its helpless condition exposed it. As a protection against the former, that wonderful people had recourse to their ingenious and skilful method of embalming their dead; and as a defence against the latter, those gigantic structures were erected, many of which still remain after the lapse of far more than three thousand years. It was under a deep impression of this belief, that the tyrant Cheops bitterly detested by his oppressed subjects, built the stupendous pile known as the great Pyramid, within whose innermost recesses, entrenched, as the surveys of science inform us, no less with marvellous cunning than surpassing strength, he hoped to frustrate the vengeance of his enraged subjects. After its completion, however, either distrustful of its security, or having all along intended it merely as a cloak to his real intentions, he gave private instructions to have his body laid in a secret place, around which the waters of the Nile were introduced; and where, for aught we know, he may be reposing to this day. The pyramid, which he originally intended for his sepulchre, is thought to have been forced soon after the death of its founder, and, at all events, was opened at an early period

by one of the Caliphs, in search of the treasures it was supposed to contain.

Not less a fortress than a tomb—and built  
More firmly far than towers, a nation's guard;  
Look on the tyrant's grave—and see how hard

It is for man to shield him from his guilt!  
Vain builder! when the blood that thou hast spilt,  
Cries from the earth to God—with crafty skill—

With giant strength—protect thee as thou wilt,  
The hand of vengeance shall pursue thee still!  
And yet is somewhat almost of sublime,

In this thy bitter struggle to inherit,  
With deadly odds against thee—ruthless time,  
And man's revenge—the life thou did'st not merit;

Alone wilt thou thy gloomy hold—no room  
For one tried friend—'tis the true tyrant's tomb!

Tyrant! thou hast but made it over sure:  
The day will come when vainly thou shalt call,  
And curse the skill that built it too secure,

On this overhanging human rock to fall!  
And thou hast forged a weapon wherewithal  
The hand of man may smite thee. Avarice

Of later times, that deems no richer prize  
Within the shelter of this mighty wall  
Can be secured, than its own idol, gold,

Hath burst upon thy slumbers. Science, too,  
The stone from this thy sepulchre hath roll'd,  
And strives, with all her potent arts can do,

To take thee captive in thy last strong hold,  
And thus to this great riddle find the clue.—  
Yet stay! for he who rear'd this fortress tomb,

To shield him in his years of helplessness,  
Hath found beneath its giant shade, no room,  
Nor sleeps within its stern and strong recess.

Is this vast pile then neither more nor less  
Than a grand juggle? a stupendous cheat?  
A tyrant's master-piece of craftiness?

To make the tide of vengeance vainly beat  
On this unyielding rock, and, baffled, foam  
With idle rage, while he sleeps all the while

Within a humbler but a safer home,  
Protected by the waves of friendly Nile,  
Like him who to the raging beast of prey

His garment throws, and steals unseen away?  
Well! be it thou hast cheated man—what then?  
Awake! for thy three thousand years are past,

Thy long-forgotten shape resume at last—  
And rise triumphant from this dreary den!  
Rise! to be great among the sons of men.

See! how they look with wondering awe  
Upon  
Thy very tomb! Rise! visit once again

Thy glorious nation—nay—for that—sleep  
on!  
True though it be that death's decisive day

Ends every struggle—finishes all strife—  
Dispels all home—yet is there still a way  
To vanish this last enemy—and life

A life of bliss eternal to provide—  
But, ah! 'tis not the way which thou hast tried!

#### New Works.

*Trade and Travel in the Far East; or, Recollections of Twenty-one Years passed in Java, Singapore, Australia, and China.*  
By G. F. Davidson.

The following blood-curdling event occurred at Samarang to an English officer, who kept a tame leopard:—

This animal had its liberty, and used to run all over the house, after its master. One morning, after breakfast, the officer was sitting smoking his hookah, with a book in his right hand, and the hookah-snake in his left, when he felt a slight pain in the left hand, and, on attempting to raise it, was checked by a low angry growl from his pet leopard: on looking down, he saw the animal had been licking the back of his hand, and had by degrees drawn a little blood. The leopard would not suffer the removal of the hand, but continued licking it with great apparent relish, which did not much please his master; who, with great presence of mind, without attempting again to disturb the pet in his proceeding, called to his servant to bring him a pistol, with which he shot the animal dead on the spot.

Tea is now successfully cultivated Java. Mr Davidson thus cuts up the Upas tree by the roots:—

“Such a tree certainly exists on the island; but the tales that are told of its poisoning the air for hundreds of yards round, so that birds dare not approach it, that vegetation is destroyed beneath its branches, and that men cannot come near it with impunity, are perfectly ridiculous. To prove their absurdity, a friend of mine climbed up an upas-tree, and passed two hours in its branches, where he took his lunch and smoked a cigar. The tree, however, does

contain poison, and the natives extract the sap, with which they rub their spear and *kriss* blades: wounds inflicted with blades thus anointed, are mortal. Such I believe to be the origin of the many fabulous stories that have passed from hand to hand, and from generation to generation, about the upas-tree of Java.”

Singapore, from what it is, is not from what it is likely to become, is an interesting place; but it has undergone considerable change since Mr Davidson visited it in 1826, and again in 1842; and he is acquainted with its change, and with the commercial prospects of this beautiful settlement, and its motley population, which consists of individuals of every European and Eastern nation, besides Jews, who are of no nation, and Americans, who now claim a whole quarter of the globe for themselves. The Eastern tribes occupy each a quarter of its own; but Europeans, Americans, and Armenians, mix together; and business hours, and money transactions, confound, for a part of every day, all national distinctions. Each class has its distinctive place of worship,—the most splendid being the Chinese pagoda. National characteristics are maintained even here. It is said:—

“A portion of the Chinese are the descendants of those who settled at Malacca two hundred years ago: they have never been to China and speak Malay much more fluently than they do their own language. Numbers of them keep their families at Malacca, having superstitious objections to a final removal, far from the graves of their ancestors. The real Chinese emigrant looks on Singapore only as a temporary home, and invariably remits something every year, according to his means, to his aged parents, wife, or sisters. He usually consoles himself for the absence from his wife, by taking to himself another of the country he resides in: the offspring of this second marriage is always properly cared for on the father's return to China, where he probably takes the eldest boy to be educated.

“The Chinese junks bring annually to this part of the world, from six to eight thousand emigrants, ninety-nine hundredths of whom land without a sixpence in the world beyond the clothes they stand in. The consequence of this is, that those who cannot succeed in obtaining immediate employment, take to thieving, from necessity.

“Ship loads of these men have been sent to the Mauritius, where they have given general satisfaction; and no better class of emigrants could be found for the West Indies. A tight curb on a Chinaman will make him do a great deal of work; at the same time, he has spirit enough to resist ill treatment. All the mechanics and house builders, and many boatmen and fishermen of Singapore, are Chinese.

“Of the other inhabitants the most numerous are the Malabares, who are principally employed as shopkeepers, and are as knowing in the art of bargain driving as any tradesman of London or Paris. They generally go here under the denomination of ‘Klings,’ an appellation synonymous, in the Singapore vocabulary, with ‘scamp,’ to which I have no inclination to dispute their title. The boats employed to carry cargoes to and from the shipping in the harbour, are almost all manned by these Klings; and excellent boatmen they are. When pulling off a heavily laden boat, they cheer their labours by a song, led, in general, by the steersman, the crew joining in chorus. They are a willing, hard working race, though rather given to shut their eyes to the difference between *meum* and *tuum*.”

Of the rising and important settlement of Hong Kong, he says—

Since the ratification of Sir Henry Pottinger's treaty, and the confirmation of the cession of the island as part and parcel of the dominions of Queen Victoria, many wealthy Chinese merchants have been making arrangements for the establishment of branch-houses here; and more than one of them had, previously to my departure last March, chartered British ships, and despatched them to the northern ports, loaded with British goods. As a depot for goods intended for the Chinese market, I consider the situation of Hong Kong to be unrivalled, and, in this point of view, of great importance. On the arrival of a ship from London, Liverpool, or Glasgow, with a general cargo of British goods, the consignees unload them, and send the ship home again with tea or such other produce as they have ready for her, storing and holding the goods in readiness for any opening that may present itself; such portion of them as may be suited for markets in the immediate vicinity, are either sold on the spot, or sent to Canton, while the rest is shipped off in fast-sailing vessels, kept for the purpose of making sure of their voyage against the monsoon, to Amoy, Chusan, and other ports to the northward.

“A decisive proof of the eligibility of Hong Kong as a place of trade, and of its importance in the eyes of the Chinese themselves, is afforded by the immense sums paid by some of them for ground on which to build *Hongs*, where they can deposit their goods in safety, beyond the reach of their grasping mandarins. This advantage to a Chinaman is something so new, and so far beyond anything he ever dreamed of enjoying, that I conceive the benefits likely to accrue from it to Hong Kong to be incalculable.

“Goods stored in Canton or Macao, the property of a Chinaman, were never safe in the event of their owner getting into trouble with the Chinese authorities; and, if the property of foreigners, they could not be insured against fire; the risk arising from the universal carelessness of the Chinese, and the consequent very frequent occurrence of conflagrations, being considered too great by the underwriters.