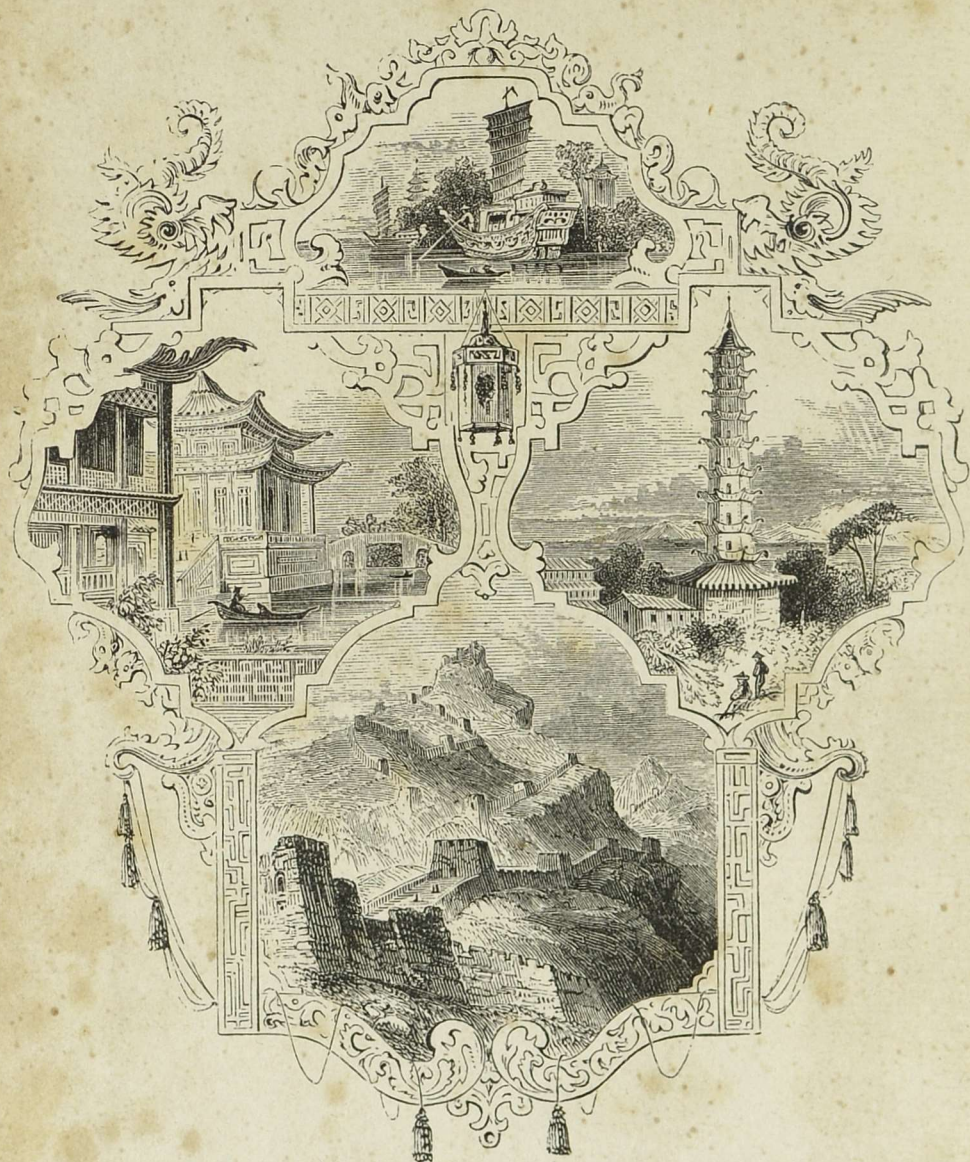


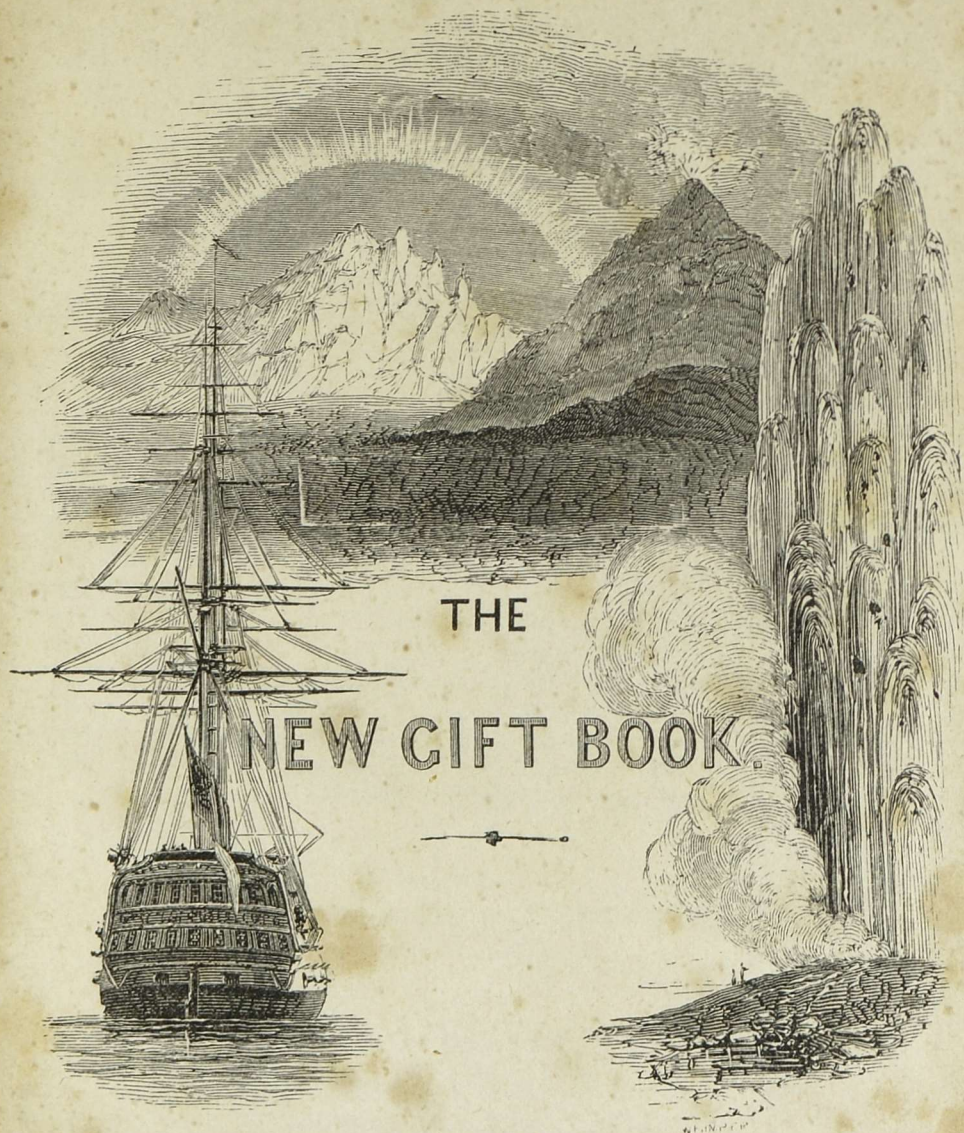


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FRONTISPIECE—GLANCE AT CHINA.



THE
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BEING
INTERESTING SKETCHES & PICTURES

CONCERNING

THE ARCTIC REGIONS.
ICEBERGS.

THE OAK STRUCK BY LIGHTNING.

THE ROOTS OF THE BANIAN TREE.

THE NEST OF THE WILD BEE.

THE HEAVENS.

THE MOON.

THE SEASONS.

PEEPS THROUGH THE MICROSCOPE.

HUMAN BLOOD AND HAIR.

DIAMOND WASHING.

THE RISE OF THE THAMES.

EARTHQUAKE AT LISBON.

BEARS AND BEAR HUNTING.

LION AND TIGER FIGHT.

TIGER HUNTING.

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TWENTY-SIX ILLUSTRATIONS.

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THE subjects of which the present work, and its companion volumes, treat, are boundless and inexhaustible ; and multitudes more might be presented, fraught with the greatest interest and instruction to the youthful mind. Care has been taken to ensure truthful accuracy, and nothing has been stated without competent authority. The Publishers trust that the engravings, which form a prominent feature in these publications, combined with a very low price, will so much enhance their value as to give them a decided superiority over the bulk

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of those books which are emphatically called "cheap books." In the tendency of the work, the Editors have aimed to associate the love of *Him* from whom all wisdom comes, with the earthly knowledge they have endeavoured to impart. Should the present attempt to give to the youthful public cheap illustrated works prove successful, the Publishers have it in contemplation to submit, from time to time, other volumes of similar character, and at the same low price.

CURIOSITIES IN THE ARCTIC REGIONS.

Most of our young readers are, without doubt, aware, that as we recede from the tropical lines, and journey either northward or southward, the temperature of the atmosphere gradually becomes colder, until at length, either in the Antarctic Ocean to the south, or in the Arctic to the north, we enter the region of perpetual ice. During the long and severe winters which are common to these districts, the ocean becomes frozen over in one continuous mass; and the vessels that may have penetrated there during the summer, are fast locked up till the summer comes round again. Continual storms of snow and sleet, biting frost, and long dark nights, are the lot of the traveller who ventures into this bleakly

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desolate region. As a vessel nears it, the description of the poet is found to be quite correct:—

“Beyond this flood a frozen continent
Lies dark and wild, beat with perpetual storms
Of whirlwind and dire hail, which on firm land
Thaws not, but gathers heap, and ruin seems
Of ancient pile, all else deep snow and ice.”

Of the frozen ocean of the south, we know but little, few voyages having been made, and those not successfully, for the purpose of exploring it.

To the north, several expeditions have sailed with more success under Captains Ross, Parry, Franklin, and Beechy; as well as the voyages that have been made there for the purpose of whale fishing. The expeditions under the above-mentioned captains had, as a main object, the discovery of a north-west passage from the Atlantic to the Pacific, and to ascertain the northern boundary of the American continent. Setting sail from England in the spring, they contrive to reach the ice as it is breaking up under the summer thaw. Then their difficulties

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begin, navigation amongst icebergs, floes, and icefields, being beset with many dangers. The former of these, icebergs, are huge mountainous masses of ice, found drifting about in the sea. Some of them have been met with more than four thousand yards long, and three thousand broad, and calculated to weigh more than a thousand million tons. Sometimes as many as sixty are seen at once, having a wonderful variety in form and appearance, resembling palaces, castles, churches, arches, obelisks, ships, trees, and towers. The sun's rays reflected from them now and then give a glistening appearance to their surface, so that they appear to be made of silver. In the night they are readily distinguished, even at a distance, by their natural brightness; and in foggy weather by a peculiar blackness of the atmosphere. Thus the danger which they threaten is much decreased.

Greater hazard is run in sailing among icefields, whose extent cannot be perceived. "They have frequently a rotatory motion, and their outer borders acquire a velocity

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of several miles per hour. When a field thus in motion comes in contact either with one that is motionless, or moving in an opposite direction, the crash is tremendous. It is easy to understand that a body of more than ten thousand millions of tons in weight, meeting resistance when in motion, produces fearful effects. With a stunning and awful noise, the weaker is crushed; while pieces of huge dimensions and great weight are piled on the top. For a ship between two meeting fields of ice there is no chance of escape. Many have perished in this way: some have been thrown upon the ice; some have had their hulls completely torn open, or divided into two; and others have been overrun by the ice and buried beneath its heaped fragments." Shunning with great care all these dangers, voyagers reach about the sixty-seventh degree of north latitude, by which time the winter is coming on again, the sea begins to be coated with new ice, and all further sailing is impeded. The vessel is got into the nearest creek or bay, where

ARCTIC REGIONS.

it can be sheltered during the winter, and it lies firmly frozen in the ice until the summer comes to free it by its thaw. As soon as a ship is perceived, the Esquimaux flock around it, to barter their oil and skins for knives, hooks, and other articles which the captain may be willing to give them in exchange. Captain Parry thus describes a party who paid him a visit on his second voyage. "These people possessed in an eminent degree the disposition to steal all they could lay their hands on, which has almost universally been imputed to every tribe of Esquimaux hitherto visited by Europeans. They tried more than once the art of picking our pockets, and were as bold and unembarrassed as ever, immediately after detection. It is impossible to describe the horribly disgusting manner in which they sat down, as soon as they felt hungry, to eat their raw blubber, and to suck the oil remaining on the skins we had just emptied, the very smell of which, as well as the appearance, was to us almost insufferable. The disgust which our seamen

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could not help expressing at this sight seemed to create in the Esquimaux the most malicious amusement; and when our people turned away, literally unable to bear the sight without being sick, they would, as a good joke among themselves, run after them, holding out a piece of blubber or raw seal's flesh, dripping with oil and filth, as if inviting them to partake of it.

Sir John Ross was one day surprised by a party of them coming to make restoration of all the articles they had stolen. The cause of their repentance was found to be the *guns*, which had been fired for the purpose of making experiments on sound. One of them having attended the commander to the observatory, and having asked what "the guns said?" was informed they were naming the thieves who had taken property of any kind from the ship; on which there was a general convocation held at the village, and it was agreed to return everything. These poor creatures often suffer severely, during their long winter, from the failure of the seal

ARCTIC REGIONS.

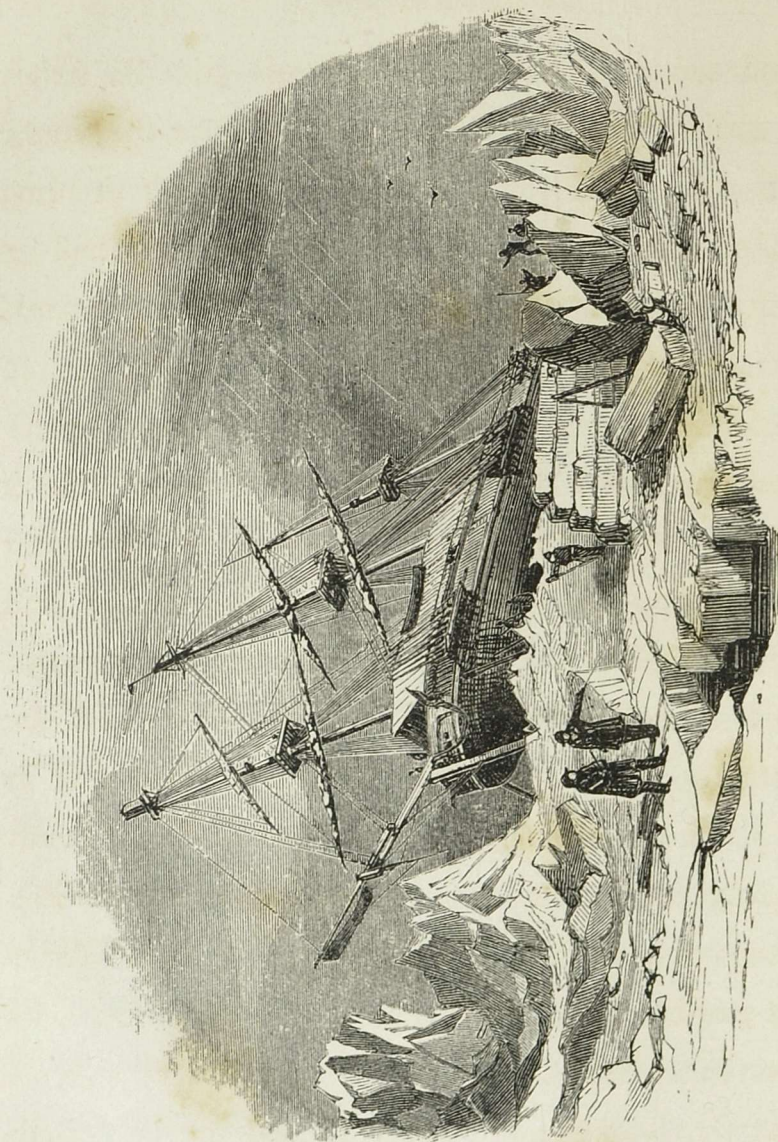
fishery. Travellers have found them in their snow huts, without light, without food, actually gnawing a piece of hard skin with the hair on it, and glad to eat a wolf's carcase, raw and frozen.

At such times of difficulty they lack the means of melting snow for water, and can only ineffectually quench their thirst by eating snow. In consequence of this, when they visit a vessel, the sailors are often surprised to see the quantity of water they will drink : a single individual has been known to drink a gallon during the short time he was on board.

Bears, wolves, rein-deer, seals, and the musk-ox, are the chief animals which are found here ; and the hunting of them forms the amusement and support of the people. Their houses are mere huts of snow, erected with as much rapidity as we could put up a tent ; a block of ice serves them for a window ; skins are spread over the snow for couches, and the crevices are stuffed up with snow. While the house is building, the boys busy themselves in erecting

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similar kennels for the dogs. When a ship visiting these regions is safely secured for the winter, it is necessary that the seamen should be kept in active exertion for the sake of their health. Sometimes they are engaged in exploring expeditions, to learn the character of the strange country and people around them ; at others they all turn out to play a game of cricket upon the ice ; or else sally forth to hunt some of the few animals that dwell in that inhospitable clime. Sir J. Ross gives an animated sketch of one of these latter excursions, in which he was engaged. Attended by one of the natives armed with a bow and arrows, and a couple of dogs, he started to hunt the musk-ox. They soon came upon the footsteps of the game, and the dogs being let slip, speedily left them behind. After two hours' laborious travelling, over a very rugged country and through deep snow, they found, on turning the angle of a hill, that the dogs had brought a fine ox to bay ; and they started off at full speed to the rescue. The Esquimaux took the lead, and was in the act of discharging



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ARCTIC REGIONS.

his second arrow, when Sir J. Ross came up. It struck on a rib without even diverting the attention of the animal from the dogs, which continued barking and dodging round it, seizing it by the heels whenever they had an opportunity, or when it turned to escape, and then retreating as it faced them. In the meantime it was trembling with rage, and labouring in vain to reach its active assailants. The weapons of the native seemed of little value in this warfare: he continued to shoot without apparent effect, finding opportunities for an aim with difficulty, and losing much time afterwards in recovering his arrows; Captain Ross therefore fired at the animal with two balls, at the distance of fifteen yards. They took effect, and it fell; but rising again, made a sudden dart at them, standing close together as they were. They avoided the attack by dodging behind a large stone that was fortunately near them. It rushed upon it with all its force, and struck its head so violently, that it fell to the ground with such a crash, that the hard ground fairly echoed to the sound. In a moment the guide was upon it, attempting to stab it

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with his knife ; but failing in his design, was obliged to take refuge behind the dogs, which now came forward again to the attack. At this time it was bleeding profusely, and the long hair on its sides was matted with blood ; yet its rage and strength seemed undiminished. Meanwhile, the gun was reloaded, and Sir J. Ross advanced for another shot, when the brute rushed at him, to the great alarm of his guide, who called out for him to return to his shelter. But time was afforded for a cool aim, both barrels were discharged, and at five yards' distance it fell, and was dead before the native came up. He was, as may be supposed, lost in astonishment at the effect of fire-arms ; and with every expression of wonder examined the bullet-holes.

They had been eighteen hours without refreshment ; accordingly, the native proceeded to mix some warm blood with snow, to quench his thirst ; and at once began to skin the animal, which, in consequence of the severe cold, it would soon have become impossible to do.

In this manner the long Arctic winter is whiled away ;

ARCTIC REGIONS.

and with the return of summer all are active and bustling, either to penetrate northward, or to return home : whichever course they take, floes, icefields, and icebergs are found floating around them, and make their course one of great peril. Some idea of the danger to be met with in navigating these seas may be formed from the fact, that the Dutch in one year have lost as many as seventy-three sail of ships among the ice. In the year 1684, fourteen of their ships were wrecked, and eleven more frozen fast during the winter. In 1835, several British vessels were lost, and eleven were beset there during the following winter. Sometimes vessels are moored to an iceberg, for the sake of obtaining supplies of water from the pools that are found on its surface in the summer season ; and sometimes to gain shelter under an adverse wind. But at all times it is a perilous situation : a little thing overturns the whole mass, and the ship is in danger of being buried by its fearful summerset.

Two vessels are sometimes moored to what is termed a

CURIOSITIES IN THE ARCTIC REGIONS.

floe, (that is, an extent of ice whose size can be perceived,) and with it drift out to sea. All the expeditions that have been undertaken to discover the north-west passage have been failures; and though high degrees of north latitude have been reached, yet they hold out no hopes of finding a nearer course to India and China by sea, than the old route by the Cape of Good Hope. The following description of a Thracian winter pictures many hardships; but the reality in the Arctic regions is far worse:—

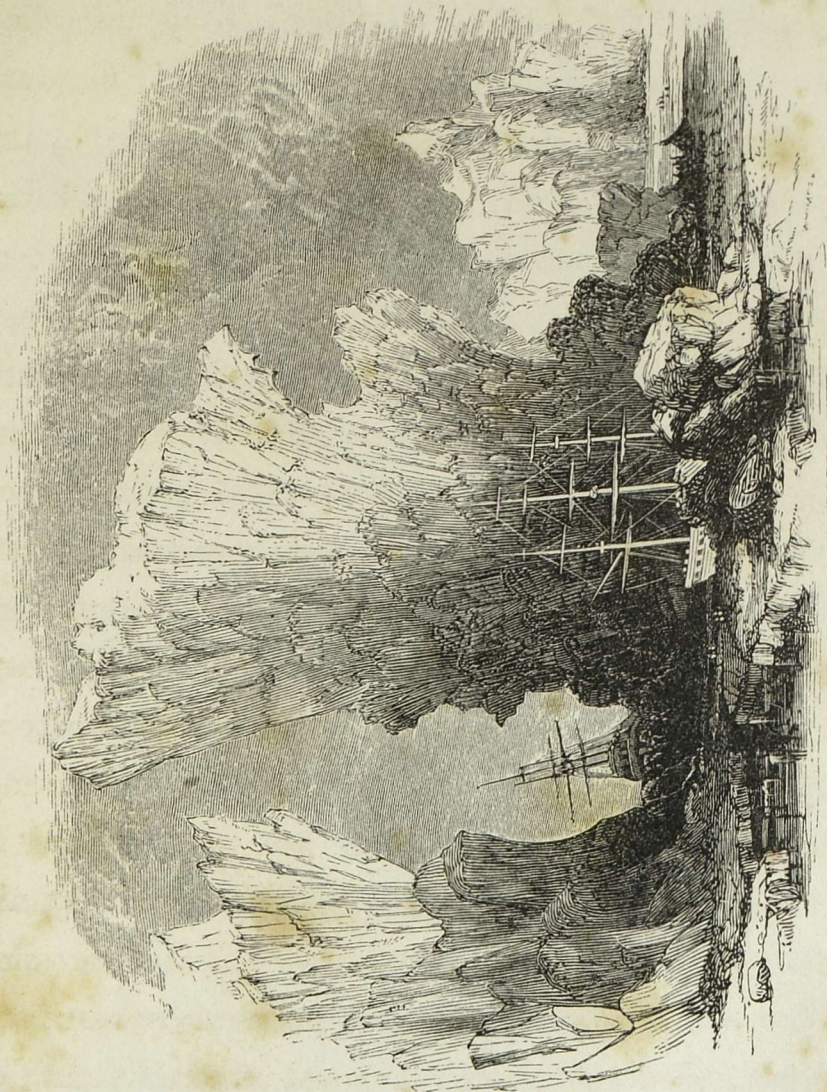
“ The brazen caldrons with the frost are flawed;
The garment, stiff with ice, at hearths is thawed;
With axes first they cleave the wine, and thence
By weight the solid portions they dispense.
From locks uncombed, and from the frozen beard,
Long icicles depend, and crackling sounds are heard;
Meantime perpetual sleet and driving snow
Obscure the skies, and hang on herds below;
The starving cattle perish in their stalls;
Huge oxen stand enclosed in wintry walls
Of snow congealed; whole herds are buried there,
Of mighty stags, and scarce their horns appear.”

ICEBERGS.

IN one of the Psalms, where several of the wonderful works of God are mentioned, it is said, "Who can stand before His *cold*?" And indeed the power of the cold in the countries that lie near the Poles, is so dreadful that no living thing can endure it, so that they are a dreary solitude, without inhabitants, without beasts or birds, without plants or trees or pleasant fields. But ice is found there in all manner of forms, some of them most strange and surprising. You see before you a representation of the seas as near to those regions as man can reach, though this is still a long way from the Pole. These enormous mountains, with rugged overhanging sides, are formed entirely of ice, and are sometimes several miles long, and

ICEBERGS.

twice as high as the ball of St. Paul's. They are called Icebergs, the word *berg* signifying a mountain. They are formed in the valleys that reach down to the sea, by the snow which falls every winter gradually becoming frozen into a solid mass. Vast pieces are split off from time to time, by different causes, and fall into the sea, where they float about and form very grand and majestic objects. They are very dangerous to approach: and the ships that are sent into these parts to procure whales, are often destroyed by them. Sometimes an iceberg suddenly bursts into several pieces, any one of which would be sufficient to wreck a ship if it fell on her. At other times, they turn over in the water, and make such mighty waves as are very dangerous. But still more perilous is it when many of these great masses of ice are together, and in motion; for they come on and frequently surround an unfortunate ship, before she can escape; and then, pressing together with a force that nothing can resist, squeeze and crush her oaken timbers as you would crack a walnut; or



SHIPS BESET IN ICEBERGS.

ICEBERGS.

sometimes, by pressing under her keel, lift her dry out of the water. Now just imagine the situation of a crew of poor sailors, many hundred miles away from home, with their vessel broken to pieces, or else enclosed by impenetrable ice, the winter coming on, in such a terrible region as this, where they could not expect the slightest chance of relief from human means, and the only prospect that of being starved or frozen to death ! The good providence of God may, however, interpose ; a few hours may open the ice in a most unexpected manner, so as to free the ship again if she has only been enclosed ; and even if wrecked, may allow other ships to approach and relieve the unfortunate men from their desolate situation.

Such accidents occasionally happen to the ships which are sent out on the whale-fishery ; for the Greenland whale is found only in these cold and dreary seas, and to obtain the oil and whalebone of this animal, many ships go every year from England and other countries into the regions of ice and snow. They leave home in the spring,

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and endeavour to return before winter, whether they have killed any whales or not. But with all their caution, the seamen are occasionally "beset," as it is called, in the ice, and instances have been known in which they have been compelled to remain there. Several years ago, eight sailors belonging to a Russian ship were ashore on an island in these icy seas, when their vessel was driven away by a sudden storm, and was unable again to reach them. They were therefore compelled to remain there through the terrible winter; and not only one; another, and another, and another, even four long dismal winters, they passed in that horrible place, before they were accidentally discovered and relieved by the crew of another ship. When first aware that they were deserted by their own vessel, they were stupified with grief, and resigned themselves to despair; but at length they took courage, and made themselves as comfortable as they could; making a hut for themselves, with many precautions to keep out the cold. They killed bears, foxes, and seals; and while they ate the

ICEBERGS.

flesh of these animals, either fresh, or else preserved by frost and buried in snow, they clothed themselves with the skins, and burned the fat instead of oil in lamps. They needed lamps both for the heat they gave, and for light during the long night; for in those climates the winter is all night, and the sun never rises for several months at a time. In summer, on the other hand, it does not set for months, but travels round and round the sky, plainly seen through every part of the twenty-four hours.

OAK STRUCK BY LIGHTNING.

of heaven, and look as if they would scorn to bend even to the wildest hurricane. It has ever been a favourite with the people, not only from its durability, but also from its forming the village rendezvous for successive generations. Spencer finely describes an old oak; though we fear some of our young readers will think his poetry none of the smoothest:

“ There grew an aged tree on the green,
A goodly oak sometime had it been,
With arms full strong and largely displayed,
But of their leaves they were disarray'd;
The body big and mightily pight,
Thoroughly rooted, and of wondrous height;
Whilom had been the king of the field,
And mochel mast to the husband did yield,
And with his nuts larded many swine,
But now the gray moss marred his rine,
His bared boughs were beaten with storms,
His top was bald, and wasted with worms,
His honour decay'd, his branches sere.”

There are several kinds of oak growing in this country,—as, the British oak, chestnut oak, holly oak, and willow oak, &c. ; but we confine our observations to one species,

OAK STRUCK BY LIGHTNING.

viz., the British oak. It not only grows in England, and the colder parts of Europe, but is also found in Spain and Hungary; though more common in the north than the south. Its timber, on account of its durability and hardness, is highly esteemed both for domestic purposes and for the use of the navy. The word "oak" has become connected with a vast number of towns and hamlets in this country; as Oakham, Oakfield, and Old, or Wold (in Northamptonshire). It is more durable for all purposes, in every position in which it can be placed, than any other tree which abounds in large quantities in Europe. Of late years the consumption of it in the English navy has been enormous, especially in time of war. The following description of the cutting down of an oak "that had stood for a hundred springs," for the purpose of the dockyard, is full of life and beauty:—

"Hark! a blow, and a dull sound follows:

A second, and he bows his head;

A third, and the woods dark hollows

Now know that their king is dead.

OAK STRUCK BY LIGHTNING.

“ His arms from their trunk are riven ;
His body all barked and squared ;
And he’s now, like a felon, driven
In chains to the strong dockyard ;
He’s sawn through the middle, and turned
For the ribs of a frigate free ;
And he’s caulked, and pitched, and burned ;
And now—he is fit for sea ! ”

Many of these trees are remarkable for age and size. The Winfarthing oak is said to have been an old tree at the time of the Conquest. It is now in a very dilapidated state, and only one branch exhibits any signs of life. Last year this was covered with verdure, and plenteously loaded with mast. Cowper’s oak, in Northamptonshire, is supposed to have been planted in the time of William the Conqueror ; but the Salcy Forest oak, in the same county, boasts a much greater age, and is supposed to have stood for one thousand five hundred years ; its trunk is forty-six feet in circumference. But, enormous as is the size above-mentioned, it is far exceeded by the bulk of some specimens of oaks that have been extracted from peat-bogs.

OAK STRUCK BY LIGHTNING.

At Linden, the seat of Charles W. Bigge, Esq., the trunk of a magnificent oak was extracted from a peat-moss that fills a small basin or hollow. This oak was covered by a layer of the peat to the depth of about three feet, and was discovered by probing the moss. The trunk, with a small portion of one of the larger limbs, was with difficulty dragged from its miry bed. The contents of the portion recovered contained 545 cubic feet. In the "Philosophical Transactions" for 1701, there is record of the discovery of an enormous oak trunk at Hatfield Chase, that measured 120 feet in length, and was eighteen feet in girth where the trunk was broken off.

There is one room in the house of Sir John Dryden, of Ashby Canons, measuring thirty feet long by twenty feet wide, which is said to be entirely floored and wainscoted from a single oak. Dr. Plot gives an account of a table in the hall of Dudley Castle, cut out of a tree which grew in the park, and was all of one plank, above seventy-five feet long and three feet wide throughout its whole extent;

OAK STRUCK BY LIGHTNING.

and which, being too long for the Castle hall, was obliged to have twenty-two feet cut from it. There is a beam of oak sixty-two feet in length and two feet square, without a knot throughout its whole extent, in the hall of Goodrich Castle, Herefordshire. It is said that the main-mast of the Royal Sovereign, built in the time of Charles I., was ninety-nine feet long and three feet in diameter, and formed out of a single piece of oak.

Some of the piles which supported the buttresses of old London-bridge, and which so greatly confined the water-way, were of oak; and the still older piles on which the bridge rested, and which were also of oak, when the bridge was taken down after the erection of the present London-bridge, were found to be in a very strong and sound condition.

Professor Burnett says, that the stakes which it is said the ancient Britons drove into the bed of the Thames, to impede the progress of Julius Cæsar, near Oatlands, in Surrey, some of which have been removed for examination,

OAK STRUCK BY LIGHTNING.

were found to be sound after the lapse of near two thousand years. One of the chairs now exhibited at Westminster Abbey, and used in the coronations of our sovereigns, is made of oak, and has been employed for its present service during more than five hundred years.

Speaking of this tree, Mr. Loudon observes that oaks are trees common to most temperate climes, generally of large size, and in point of usefulness to man, only to be equalled by the pine and fir tribe. The latter may be considered the domestic, and the former the defensive trees of civilized society in the temperate regions throughout the world. The oak, both in Europe and America, is the most majestic of forest trees. It has been represented by Marquis as holding the same rank among the plants of the temperate hemispheres that the lion does among quadrupeds, and the eagle among birds; that is to say, it is the emblem of grandeur, strength, and duration. In short, its bulk, its longevity, and the extraordinary strength and durability of its timber, attest its superiority over all

OAK STRUCK BY LIGHTNING.

other trees for buildings that are intended to be of great duration, and for the construction of ships. In one word, it is the king of forest trees.

In reference to the timber consumed for the navy, Mr. M'Culloch observes, it has been supposed that not more than forty oak trees can stand on an acre of ground, so as to grow to a full size fit for ships of the line, or to contain one load and a half of timber; fifty acres, therefore, would be required to produce a sufficient quantity of timber to build a seventy-four-gun ship, and one thousand acres for twenty such ships; and as the oak requires at least one hundred years to arrive at maturity, 100,000 acres would be required to keep up a successive supply for maintaining a navy of 800,000 tons.

The acorn, or fruit of the oak, is used for the purpose of fattening swine, though formerly to a very much greater extent than at present. Under the earlier Norman monarchs, one constant source of dispute between their haughty barons and the unbending Saxon people

OAK STRUCK BY LIGHTNING.

was the right claimed by the latter of driving their herds of swine to feed on the mast of the forest. In English parks, acorns form an important part of the winter food of the deer. Up to a late period, large herds of swine were driven to be fed on the acorns which grow in the New Forest, and were called together by the sound of the swineherd's horn.

These magnificent trees often attract thunder-clouds, and are torn and shivered by the lightning of heaven. The old and doddered oak that for ages has withstood the summer's sun and winter's storm, through whose crooked branches the wild winds have whistled, when smitten by the lightning, is rent to shreds, and hurled to the earth with as much ease as the arm of a stalwart man throws down the toy-built structures of a child. The following verse from the "Lays of Ancient Rome" graphically sketches such an event:—

"And the great lord of Luna
Fell a that deadly stroke,

OAK STRUCK BY LIGHTNING.

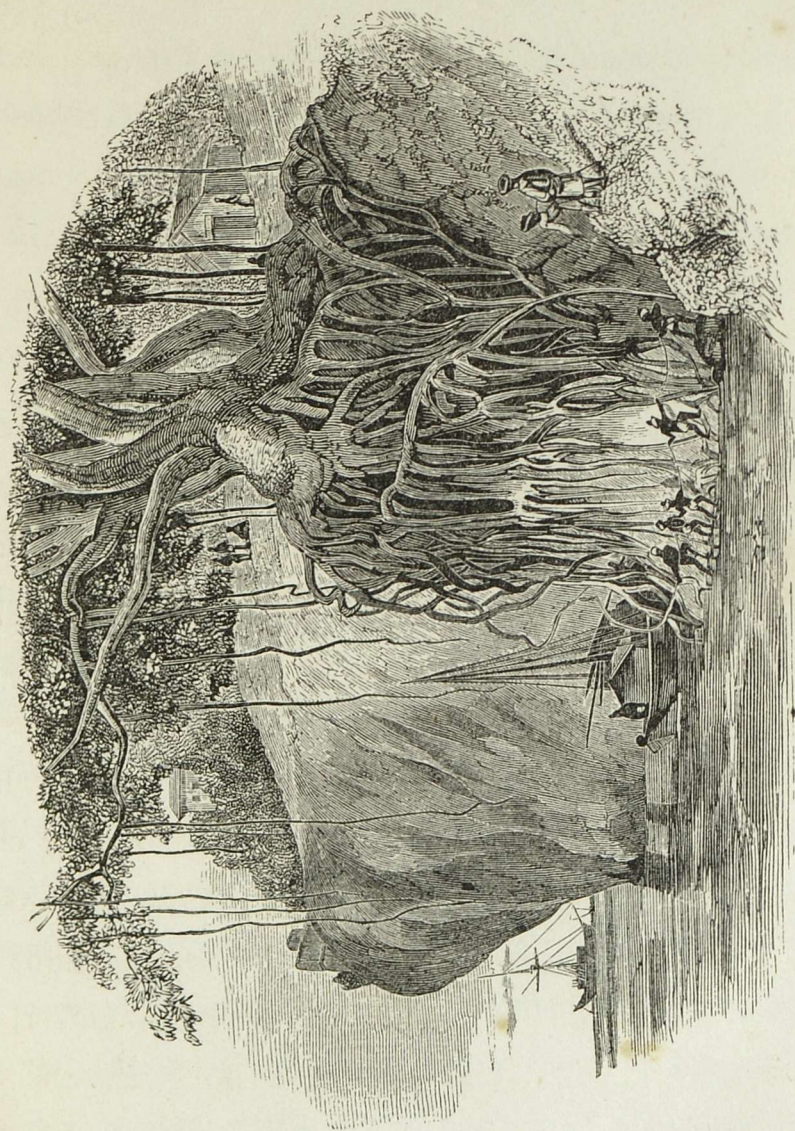
As falls on Mount Alvernus
A thunder-smitten oak ;
Far o'er the crashing forest
The giant arms lie spread ;
And the pale augurs, muttering low,
Gaze on the blasted head."

Our engraving is a good illustration of this.

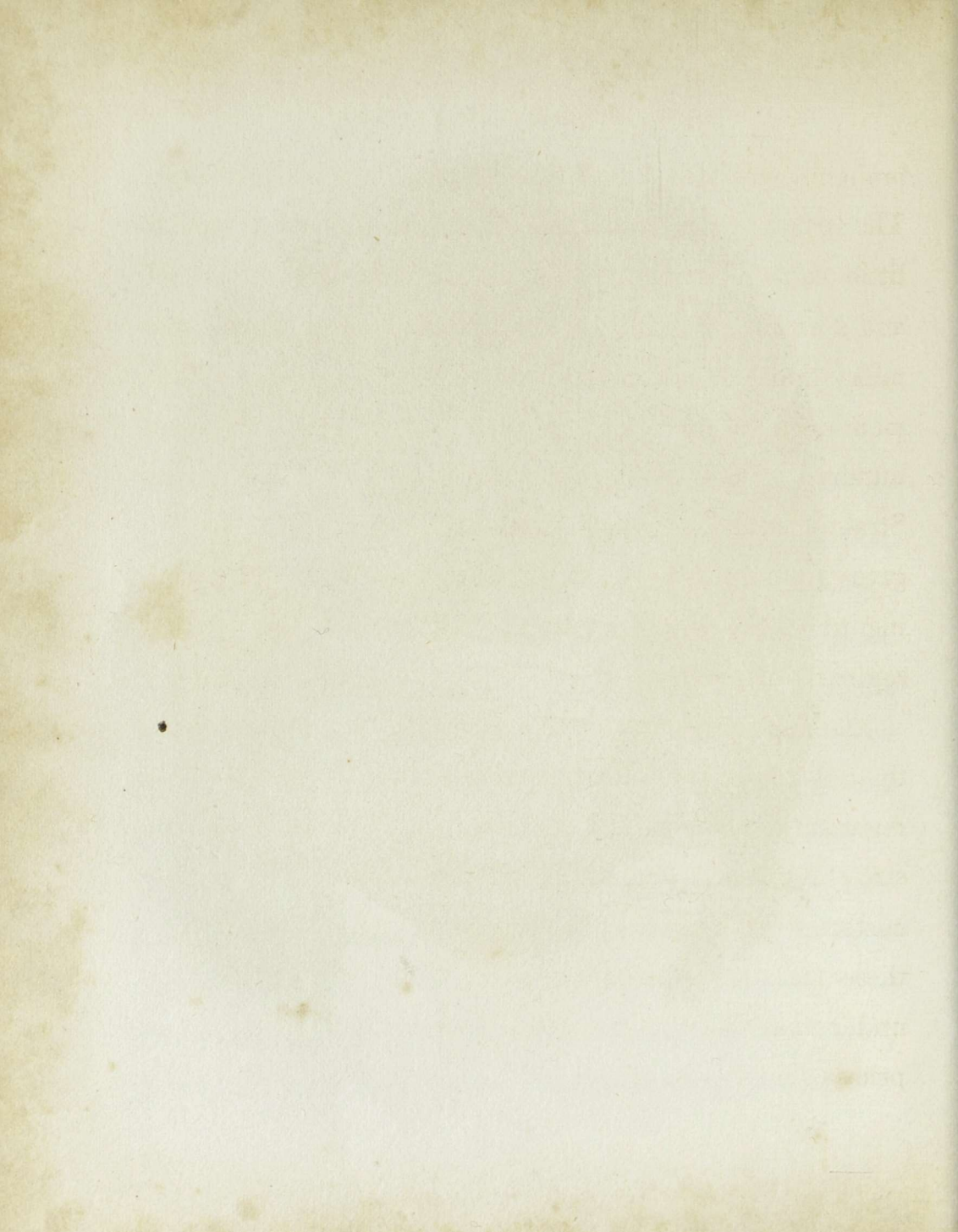
The bark of this tree is used for the purpose of tanning hides ; and in order that it may be peeled off the more easily, the tree is cut down in the spring, when the sap has begun to flow. Of late years, many Levant oaks have been planted in this country: the wood is of quicker growth, but not so durable as the kind we have been describing.

ROOTS OF THE BANIAN-TREE.

OUR engraving represents the clustering roots of an Indian fig-tree, known to botanists as the *figus Indica*, and to people generally as the banian-tree. It is a native of most parts of India, both on the islands and the main land, and is said to reach the greatest perfection on the skirts of the Circar mountains. The figs when ripe grow in pairs, at the junction of the leaf with the branch, and are about the size and colour of a middle-size red cherry. Every branch from the main body throws out its own roots, at first in small tender fibres, several yards from the ground; but these continually grow thicker, until they reach the ground, and then, striking into the earth, become in their turn parent trunks, sending out similar



BANYAN TREE.



ROOTS OF THE BANIAN-TREE.

branches, yet still keeping their original stock preserved. The wood is light and porous, white in colour, and of little value ; but the leaves are used as plates to eat off, and a kind of bird-lime is manufactured from their thick, milky juice. They cover large spaces of ground : one is mentioned as covering an area of one thousand seven hundred square yards. In the writings of Pliny and Strabo mention is made of the banian ; the former, indeed, gives a minute detail of its appearance and growth, affording under its wide-spreading branches shelter to a whole regiment of cavalry.

The appearance of this tree in the forests of Ceylon or the uplands of India must be very striking. The Hindoos regard it as sacred ; and, from its long duration, its outstretching arms, and overshadowing beneficence, are accustomed to regard it as an emblem of Deity. Near these trees their most esteemed temples are built ; and under the shade of its broad leaves their Brahmins or priests find a cool abode. The natives of all castes and

ROOTS OF THE BANIAN-TREE.

tribes are fond of enjoying the grateful retreat and pleasant walks which it affords: not even an Eastern sun penetrates its leafy canopy. Milton has finely described it in the ninth book of his *Paradise Lost*:—

“ In the ground
The bending twigs take root, and daughters grow
About the mother tree, a pillar'd shade
High overarch'd, and echoing walks between.”

When the seeds of the banian-tree drop in the *axils** of the palmyra-tree, the roots grow downwards, embracing the trunk in their descent; and gradually they envelop every part except the top. In very ancient trees the leaves and top of the palmyra are seen standing out of the banian trunks as if they grew from them. The Hindoos look upon such instances with great reverence, and speak of them as holy marriages appointed by Providence. The rarity of these instances adds to the veneration with which they are regarded.

* *Axil*—The angle formed by the insertion of a leaf or branch into a branch or trunk.

ROOTS OF THE BANIAN-TREE.

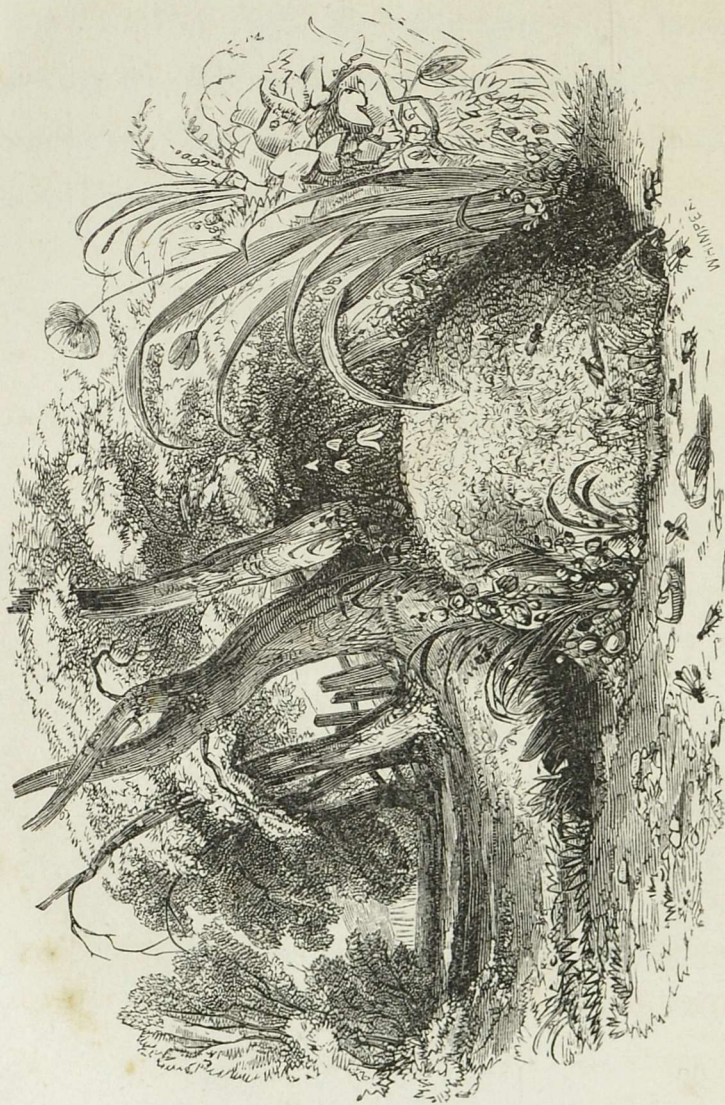
In Ceylon, one of this kind of trees is described as being more than four hundred feet in diameter ; and under its foliage the whole village was accustomed to assemble, and great public meetings were sometimes held. In its native forests the banian becomes the abode of numberless monkeys, who, as they spring from branch to branch, plucking its fruit, grin and chatter with unceasing delight. Hanging, too, from some stretching branch, and easily mistaken for the tendril of a root finding its way to the soil, may sometimes be seen the cunning snake, lying in wait for its unwary prey. Its roots when laid bare by the slip of some bank on which it has grown, are found to grow clusteringly together, in a way that much exhausts the soil. Thus, though the widest spreading of all the trees of the forest, it never lives to be the oldest. Were it not from this exhaustion of the soil, there would seem to be neither check to its progress, nor end to its duration. An Indian traveller says, that he has seen them five hundred yards round the circumference of the branches, and a

ROOTS OF THE BANIAN-TREE.

hundred feet high, the principal trunk being more than twenty-five feet to the branches, and eight or nine feet in diameter. The following lines from the *Curse of Kehama* must close our account of this wonderful tree :—

“ It was a goodly sight to see
That venerable tree.

For o'er the lawn, irregularly spread,
Fifty straight columns propt its lofty head,
And many a long depending shoot,
Seeking to strike its root,
Straight like a plummet, grew towards the ground,
Some on the lower boughs, which cross their way
Fixing their bearded fibres round and round,
With many a ring and wild contortion wound;
Some to the passing wind, at times, with sway
Of gentle motion swung;
Others, of younger growth, unmov'd were hung
Like stone-drops from the cavern's fretted height.
Beneath was smooth and fair to sight,
Nor weeds nor briars deform'd the natural floor;
And through the leafy cope which bowered it o'er
Came gleams of chequer'd light.
So like a temple did it seem, that there
A pious heart's first impulse would be prayer.”



WILD BEES' NEST.

THE NEST OF THE WILD BEE.

WE may safely say that no animal of its size has had so much attention paid to its habits, or so much study devoted to the understanding of its plans and proceedings, as the bee. It has become the general type of industry and economy, and accompanied by the motto, "*Nil sine labore*," "Nothing without exertion," forms a favourite device with the people. A prodigious number of books have been written, periodical publications have appeared, and even learned societies have been founded, to promote our knowledge of the bee, and increase its usefulness to man. Poets of every age have derived from it some of their most beautiful illustrations. No nation upon earth has had so many historians as the bee. To enter into an elaborate

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description of an insect with which every child is acquainted would be needless ; we shall therefore content ourselves with taking a glimpse or two of some of its principal habits. To every hive or nest of bees there is one female bee, termed the queen bee, whose chief duty is to deposit the eggs by which the race is kept from being extinct. “ If the queen be removed from a hive, and a strange queen be immediately introduced, she is surrounded and kept prisoner until she dies of hunger, for the workers never sting a queen bee. If, however, eighteen hours have elapsed since the loss of the former queen, the stranger is better received, for, although she is at first surrounded, she is ultimately set at liberty, and treated with all the usual attention ; but if four-and-twenty hours have elapsed before the strange queen be introduced, she is at once admitted to the sovereignty of the hive. While the queen remains in a hive, the introduction of a strange queen will occasion a disturbance somewhat similar to that which takes place when two or three young queens

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escape from their cells at the same time ; both the stranger and the reigning queen are surrounded by the workers, and the escape of either being thus prevented, they are soon brought into contact. A battle ensues, which ends in the death of one of them, and the other then becomes the ruler of the hive.

We have spoken once or twice of "the hive;" it may be as well to say that this is a basket or box in which the bees build their cells and store their honey, and serves the same purpose as the nest of the wild bee, which our picture represents. Bees are found in almost every country in the world ; and in Africa and the East are frequently found wild. We all remember the New Testament account of John the Baptist ; " His meat was locusts and wild honey." Sometimes the nests of these wild bees are of very singular construction, and very curiously situated. It is related in the book of Judges that Samson, aided by supernatural strength, rent a young lion that warred against him, as he would have rent a kid ;

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and that, after a time, as he returned to take his wife, he turned aside to see the carcase of the lion, when there was a swarm of bees and honey in the carcase of the lion. Most probably a sufficient time had elapsed for all the flesh of the animal to have been removed by birds and beasts of prey, and ants. Herodotus relates that a swarm of bees took up their abode in the skull of one Silius, an ancient invader of Cyprus, which they had filled with honeycombs, after the inhabitants had suspended it over the gate of their city. Aldrovandus gives an account of some bees that inhabited and built their combs in a human skeleton in a tomb in a church at Verona. Hollow trees, fissures in rocks, or holes in banks, are the more usual places to which they resort. Sometimes they take up their abode in the thatch of a roof; and occasionally too they will build between the interstices of slated roofs. We were present at a gentleman's house a winter or two ago, when the carpenter was sent for to search the roof, in order that a bees' nest supposed to be there, might be

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destroyed. It was winter time, and as the bees were judged to be dormant, if any should be found, the whole party, ladies and gentlemen, ascended to the attic to see what discovery would be made.

The carpenter commenced his search just where the roof shoots over the side wall of the house, at a particular spot, where the sound of the bees had been heard. After taking out a stone or two, large pieces of honeycomb, curiously shaped to fit the aperture, were pulled out: and, as he extended his search, fresh honeycomb was discovered. But though one or two false alarms of "Bees!" for the purpose of frightening the ladies, were given by the more youthful part of the company, no bees and no honey were found. Considerable quantities of comb were taken out, and the opening stopped up.

In Brazil the wild bees build clay nests, sometimes of great dimension. They are of an oblong shape, much like a skin-bottle in form, and made of such compact material that no rain can penetrate them, and no enemy

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but the bear break in upon them. Some of the uncivilized tribes of mankind show great ingenuity in discovering the nests of the wild bee. Sir J. Alexander, giving an account of his expedition into the interior of Africa, says, "Whilst I was engaged in the chase one day on foot with a Namaqua attendant, he picked up a small stone, looked at it earnestly, then over the plain, and threw it down again. I asked what it was. He said there was the mark of a bee on it. Taking it up, I also saw on it a small pointed drop of wax, which had fallen from a bee in its flight. The Namaqua noticed the direction the point of the drop indicated, and walking on, he picked up another stone, also with a drop of wax on it, and so on at considerable intervals, till, getting behind a crag, he looked up, and bees were seen flying across the sky, and in and out of a cleft in the face of the rock. Here of course was the honey he was in pursuit of. A dry bush is selected, fire is made, the cliff is ascended, and the nest is robbed in the smoke."

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In Australia the natives exhibit quite as much ingenuity in discovering where the wild bee has his nest. Watching an opportunity, they contrive to catch one of the bees, and fix to it by means of some resin or gum the light down of the swan or owl. Thus laden, the bee makes off to its store-house, generally the branch of some lofty tree, and unwittingly betrays its home of sweets to its keen-eyed pursuers.

Independently of man they have many enemies: the bee-eater feeds upon the insect; and the bear delights to feast upon its honey, but for which he sometimes pays dearly.

In Russia there are individuals who, beside their bee-gardens, possess hundreds and thousands of wild-bee hives in the woods. When the people wish to establish hives in the forest, they select the straightest and strongest trees which they can find, always preferring the hardest kind of timber. On these, at the height of twenty-four or thirty feet above the ground, they make the bee-house, by hol-

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lowing out a large smooth cavity in the trunk of the tree with a tool like a chisel. When the work is done, the opening is closed with a board with several holes in it, large enough for the bees to get in and out easily. It is then left for them to discover, which they speedily do, and gladly avail themselves of the convenience it affords to deposit their honey there. These hives are constantly robbed by the bears which abound in the neighbourhood, and the ingenuity of the peasant is called into exercise to protect his stock from depredations. One of their contrivances is thus described:—“It is not unlike a large scale, such as we sometimes see in wholesale shops, consisting of a board, with ropes at each corner, united at the top. It is then fastened to a branch above the hive in such a manner, that if left suspended perpendicularly, the board would be at some distance from the trunk. But when the rope is properly fastened to the branch, the board is drawn from the perpendicular, and attached slightly to the trunk on a level with the door of the hive.

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When the bear ascends and finds a seat which seems so admirably adapted to his convenience, he gets upon it, and soon commences lugging to remove the only obstacle between him and his desired prey ; but as this obstacle is the fastening of the board to the trunk of the tree, the animal no sooner succeeds in his object than his seat swings off with him to its perpendicular. He thus remains suspended in the air, in a sufficiently mortifying situation, until some one arrives to shoot him. But sometimes he throws himself off, and is then stuck through by the pointed stakes which are planted round the tree.”

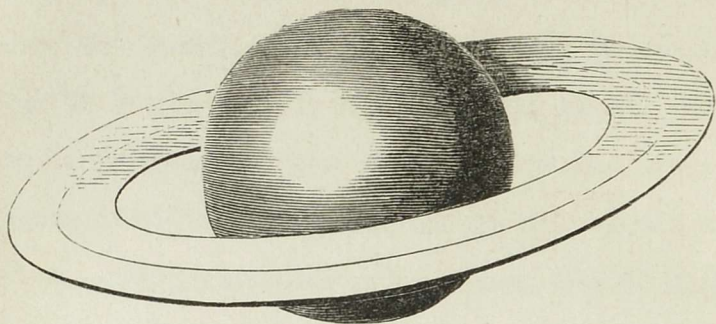
Pliny relates that bees were so troublesome in some parts of Crete, that the inhabitants were compelled to forsake their homes ; and it is recorded by another historian, that some places in Scythia were formerly inaccessible on account of the swarms of bees with which they were infested.

Mr. Park relates that at Dooproo some of the people being in search of honey, unfortunately disturbed a swarm

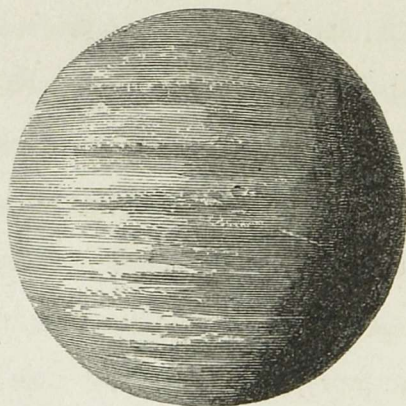
THE NEST OF THE WILD BEE.

of bees, which came out in great numbers, attacked both men and beasts, obliged them to fly in all directions, so that he feared an end had been put to his journey ; they stung his beasts so that one ass died the same night, and another next morning. Even in this country, the stings of two exasperated hives have been known to kill a horse in a few minutes.

At the present day, the people there use a device to prevent them from swarming and flying away ; managing to divide the stocks. In the month of August the bee-keepers take out their honey, which they also do in the day-time, when most of the bees are abroad. The industry of this little insect, and his provident provision for the winter, might instruct many a larger animal, and give men one hint more of the truth, “ While laziness clothes a man with rags, by industry is the substance increased.”



6



5



SATURN AND RING.—JUPITER AND SATELLITES.

THE HEAVENS.

WHEN you look up at the blue sky, it appears as if you saw a vast arched ceiling, but this is only a deception of the sight : you do not in fact look upon any object, but into empty space, which would appear deeply black if it were not for the light reflected from the particles of the air, and is blue only because the air is slightly tinged with that colour. Now, here and there in this immense empty space, there are scattered large round worlds, far larger probably than you have any notion of, and this earth on which we are living is one of these worlds. You are aware that if you see even a large object, a house or a tree, at a great distance, it appears very small, and smaller still if you go further off. Hence these worlds appear

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very small because they are at an immense distance, and some of them so excessively distant that they are seen only as little shining specks, which we call *stars*. Some of these are so placed as to move in circles round a larger one which stands still in the middle, and these are called *planets*. This earth is a planet, and is continually moving, with about twenty-eight others, round the sun. The principal of these are here represented, that you may see their sizes as compared with one another; by which you will perceive, that this earth, great as it appears, with all its oceans and countries, its houses, and fields, and trees, and ships, is but one of the very smallest. 1, Mercury; 2, Venus; 3, Earth; 4, Mars; 5, Jupiter; 6, Saturn: there is another large one, called Uranus, nearly half as large as Saturn, which there was not room to represent. There is a curious double ring round Saturn, one within the other. The sun, round which these great worlds roll, is believed to be a solid dark body, like one of them, but surrounded, at some distance, by a luminous atmosphere. Let us try

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to explain this. If you could make a thin hollow ball of soft cotton wadding, and then place in the centre of it a marble, so as just not to touch the cotton, the marble would represent the sun's body, and the cotton its *atmosphere*. Now, if you imagine the outside of the cotton to be shining, (we do not mean glossy, but really light in itself, like the flame of a candle,) you will know what we mean by a *luminous* atmosphere. The sun is a great deal larger than all the planets put together; and it is supposed that almost all the stars you see by night are suns, each surrounded by its own set of planets, which are not large enough to be seen at this distance.

But a good many of the twenty-nine planets that roll round our sun, roll round other planets as well, and are called moons. There are six moons constantly whirling round Uranus, seven round Saturn, and the double ring is continually whirling round also; four round Jupiter, and one round the Earth. When you look up at the lovely moon, cheering the lonely night and casting her

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silvery lustre over the silent earth, think that you are looking upon another world, fashioned like the one you are living on. Many wise men have thought that all the planets and moons, and even the sun, are inhabited by men like ourselves; or, at least, by creatures capable of knowing and worshipping God. Some of the reasons why the planets are thought to be inhabited we will mention. You have been told that they all move round the sun; they all move round in another manner also, which you will understand by comparing it to the spinning of an apple hanging from a thread tied to its stem. If you hold the thread in your hand, and while the apple is twirling round move it in a circle round a candle, you will see the two motions which the planets have. The twirling is called *rotation on an axis*. Now some of the planets do not move round the sun in a perfectly even plane, but a sloping one, as if you should hold the apple so as to be a little higher in one part of the circle, and lower in the opposite. This causes the difference of the seasons, with-

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out which there would be neither summer nor winter, but the year would be all alike. Again, the rotation on the axis is the cause of day and night; without which every part of the planet would see the sun for half the time of its revolution, and would be without it the other half; and one of the planets makes its revolution only once in eighty years, so that if it were not for the rotation, there would be a forty years' day, and a forty years' night. The providing of some of the planets with moons, particularly those which are most distant from the sun, can only be, as far as we can understand, for the purpose of supplying light by night; but if there be no inhabitants in these worlds, it would appear to our poor feeble judgments useless to have change of seasons, and alternate day and night, and provision for cheering the dark hours with borrowed light. The moon, also, which is near enough to us for us to discover, with a telescope, something of its surface, and which on that account we know most about, is uneven, with valleys and mountains, like the world we

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live on ; and as in many other respects both the planets and moons are like this earth, it is natural to think that they are not desert wastes, but covered with beings capable of glorifying God, who has made all things for his glory. Still we cannot be certain of this, as God may have many other uses for these brilliant globes, than our weak reason can discover. Whether inhabited or not, we may be sure that they are worthy of Him who made them.

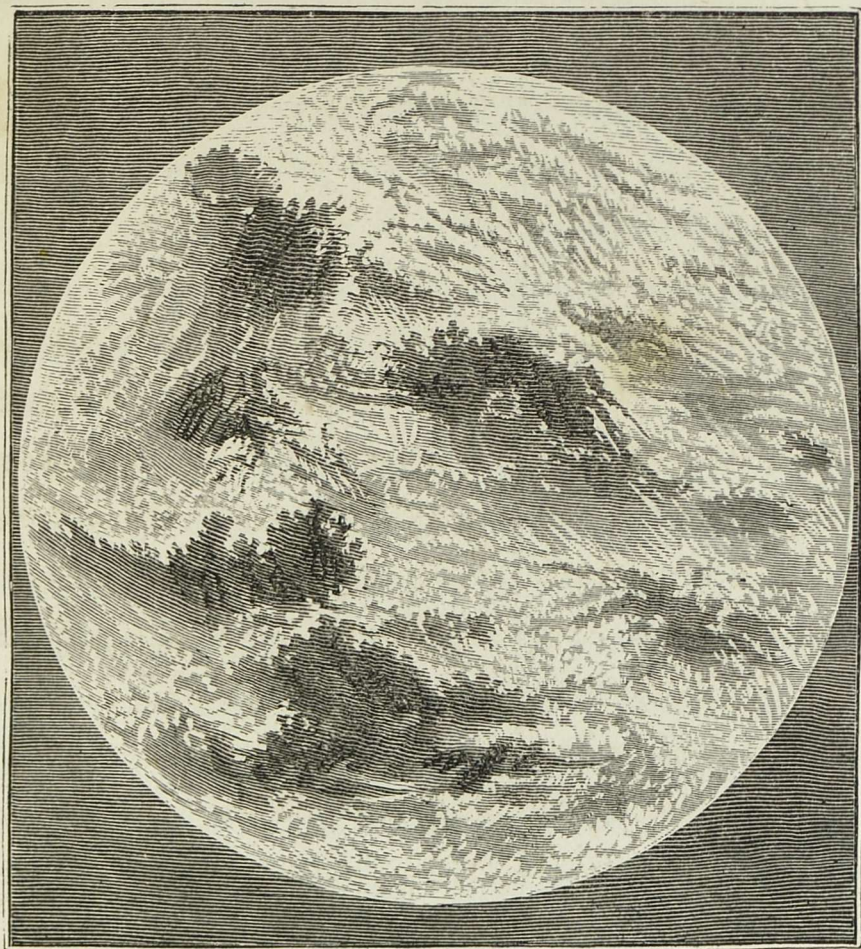
Besides these planets and moons, there are several other bodies called comets, which move round the sun also, but not in a circle as the planets do, but in an exceedingly long oval. These are very singular bodies, and astronomers do not as yet know very much about them. Their usual appearance is that of a dim star, sometimes, however, very large and bright, surrounded with a haziness or faint cloud of light, and frequently attended by a long stream of dim light, which stretches out behind, and is called the tail. When a comet

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approaches the sun, it moves faster and faster, until it at length whirls round that luminary with astonishing rapidity, and then gradually loses its speed as it flies off again, through the courses of the planets, into those distant regions of empty space, where the human eye cannot follow it, even though assisted by the finest telescopes. Yet, at the appointed time, God brings them round again, and wheels them, immense as they are, towards the sun. The perfect regularity with which the motions of the heavenly bodies are performed, are calculated to give us higher thoughts of the greatness of Him that made them.

THE MOON.

THE moon, being by far the nearest to us of all these worlds, would therefore appear much larger, only that it is in reality the smallest of them all. When seen through a telescope, the moon appears covered all over with risings and hollows, in a very irregular manner, which, to the naked eye, seem large patches of bright and dark, and make what is foolishly called the *face* in the moon. The best time to look at these through a telescope is at about half-moon ; when, with a powerful instrument, you can see that every dusky patch is a valley, and every bright spot a hill. Like all the planets, the moon has no light of its own, but appears bright merely because it is shone upon by the sun ; at half-moon the sun's rays fall



THE MOON AS SEEN THROUGH A TELESCOPE.

THE MOON.

slantingly upon the moon, and the ridges of hills and mountains throw strong and dark shadows on the side farthest from the sun. Some of the mountains are very lofty, and these are the brightest spots of all. They are often of curious forms: a very common scene in the moon is a range of high hills set in a large circle, enclosing a plain, in the very middle of which there is a smaller hill alone.

The engraving represents the appearance of the moon through a telescope, as seen at the full. The distance of the moon is two hundred and forty thousand miles; that is, a distance which if you were to walk twenty miles every day, would take you more than thirty years to travel; and yet this distance is trifling compared with that of some of the stars. If we could travel to the moon, we should see this earth in the sky, exactly as the moon appears to us now, but about thirteen times larger; and it is likely that the divisions of land and water, the oceans and seas, the continents and islands, would be seen

THE MOON.

as they are upon a map ; and as the earth turns upon its axis once every twenty-four hours, every side of it would be visible to the moon during that time. It is probable, however, that the clouds, which so often fill our atmosphere, and prevent our seeing the heavenly bodies, would, in a great measure, prevent the surface of the earth from being plainly discerned there. There is this difference between the appearance of the earth and the moon, that whereas the latter rises and sets to us, the earth would always be in the same place to the inhabitants of the moon, never changing its position, but apparently fixed in the sky.

The sun and the moon serve other purposes to this earth, besides the merely affording light to it : without them we should have no mode of measuring time, but the order and exact regularity of the revolutions of these bodies afford us a correct measure of time. And this appears to have been the meaning of God, when he said, “ Let there be lights in the firmament of heaven to divide

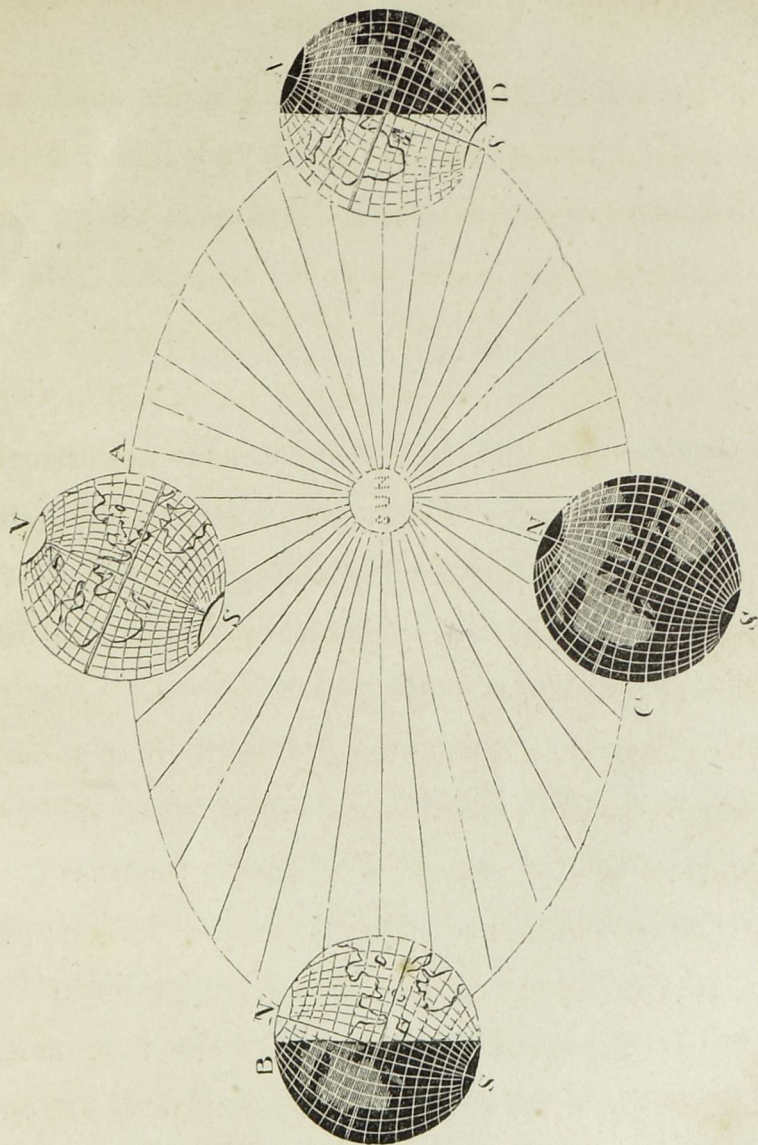
THE MOON.

the day from the night ; and let them be for signs, and for seasons, and for days, and for years." The tides depend on the motions of the sun and moon ; and without them navigation could not be safely carried on, as the position of a vessel out of sight of land could not be ascertained, as it now can very exactly.

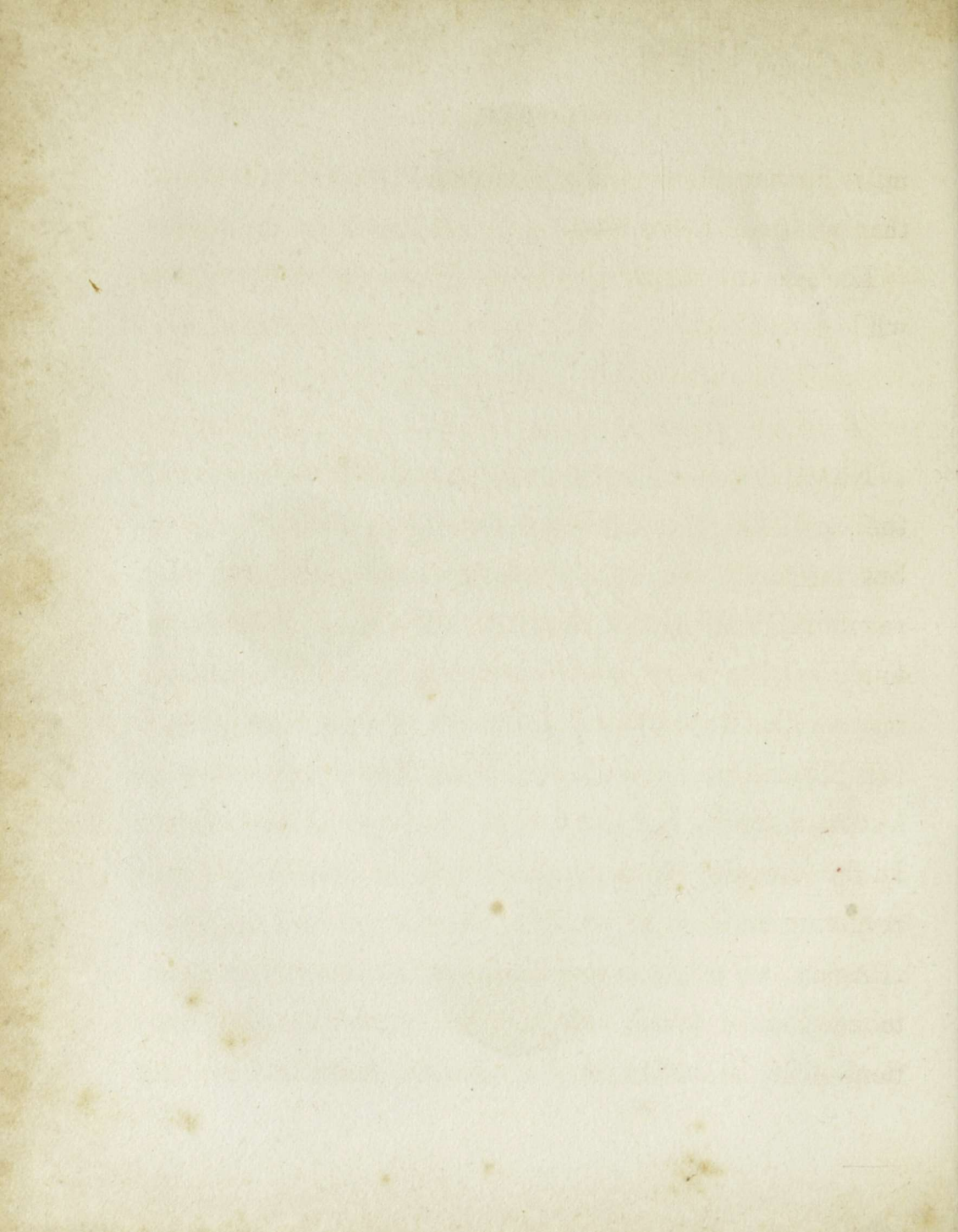
THE SEASONS.

THE variation of the seasons is not easily understood, yet we may overcome the difficulty by attention, and the assistance of the accompanying diagram, intended to show the earth's position with respect to the sun at different portions of the year.

Why, then, should the sun give more heat to any particular portion of the earth—say to our island of Britain—at one time of the year than it does at another? What makes it so cold here in December and January, and so warm in July and August? It might, perhaps, be supposed that the earth is nearer to the sun in summer, and further off in winter; but, on the contrary, astronomers have proved that we are actually nearly three millions of



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miles further off the sun at our hottest portion of the year than we are at our coldest.

Look at the diagram! There is the sun in the centre, while round him,

“On her smooth axle spinning, sleeps the earth.”

Now this axle, of course, is not a real pole stuck through the earth like a knitting-pin through a ball of worsted, but is merely the term used to describe the part of a revolving body round which it turns itself. Now, we might spin an ivory ball on a smooth, level table in such a manner that it would not leave the spot on which it was first placed, but would keep turning there for a longer or a shorter time, in proportion to the impulse first given. In this case the ball would have only *one* motion—that of revolving on its axis.

Again, we might roll the ball from one part of the table to another, in which case the ball would have *two* motions—one, as before, on its axis, and another from one

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part of the table to another. It is in this latter way that the planets roll round the sun ; but the position of the axis with respect to the orbit, or course round the sun, varies in different planets.

Our earth, which has its axis slightly slanted from the perpendicular, turns round once in every twenty-four hours, during which each part of its surface is by turns brought towards the sun's light, and then gradually rolled away from it into the shadow of night. Besides thus turning round on its axis, it rolls round the sun in a little more than three hundred and sixty-five days—that is, while it is going once round the sun, it turns three hundred and sixty-five times round itself, or, as it was before explained, round its axis.

Well, then, we see the axis of the earth, (represented by a straight line running from N. to S.) in four positions with respect to the sun. In each of the four positions, N. (or the North Pole) slants towards the right hand, or the East ; and S. (or the South Pole) towards the left hand, or

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the West. Now, when the earth is at D, we may see that the North Pole is slanted *away* from the sun; when at B, it is slanted *towards* him, and the South Pole the contrary in each case. At A and C each pole receives an equal portion of the sun's light during the day, and is equally in darkness for the night; the night and the day being at these two periods of equal length, namely, twelve hours each, all over the world. Now, we all know that in England, during the latter part of June, the days are at the longest: the sun rises soon after three o'clock; at mid-day he is high over head; and he does not disappear till nearly ten o'clock, and it is hardly dark all night. And if, at this time of the year, we went still further north—for instance, to Sweden, we should find the days still longer, and the nights still shorter than in England. Further north still, as in Lapland or Iceland, we should have no night at all, but the sun would continue above the horizon for many days together; that is, for many revolutions of the earth on its axis. On the other hand, at the very same time of

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the year, namely, the latter end of June, the South Pole is slanted *away* from the sun, as much as the North Pole is slanted *towards* it, and instead of there being no darkness there, there is no daylight. Figure B shows the position of the earth with respect to the sun on the 21st of June, which is the longest day in the northern, and the shortest day in the southern hemisphere. On the other hand, the 21st of December is the shortest day in our northern hemisphere, and the longest in the southern; and, on that day, the earth is placed with respect to the sun as at figure D, with the South Pole slanting towards the sun, and the North Pole away from it. Figures A and C show the position of the earth at about the 21st of March and the 23rd of September, when the day and night are equal all over the world, whether north or south of the equator, each being of course twelve hours long. These periods are named the Vernal, (or Spring,) and the Autumnal, Equinox; only, when it is Autumn with us, (in September,) and the days are becoming shorter, it is Spring,

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and the days are becoming longer in South America, at the Cape of Good Hope, in Australia, and New Zealand, and other parts of the southern hemisphere.

Now, perhaps you may have remarked that, in general, the shortest day is not the coldest, nor is the longest day the hottest in the year ; according to the old proverb,

“ As the day lengthens,
The cold strengthens.”

A little reflection will suggest the reason of this. On our shortest day, the sun, besides shining on us for only five hours out of the twenty-four, does not rise so high above us at noon as he does by six o'clock in the morning at Midsummer—his rays, instead of pouring down direct upon our part of the earth, and penetrating its surface, slant off, just as an arrow or cannon-ball, which strikes any object obliquely, will either glance off, or, if it penetrate at all, will do so to a much less depth than if thrown with the same force so as to strike directly, or in a direction perpendicular to the surface struck. That

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part of the earth which is under these circumstances, loses every night *more heat* than it has acquired during the day, and continues to do so for some time after the days have begun to lengthen and the nights to decrease : and the greatest degree of cold in England is generally experienced during the second or third week of January, or nearly a month after the shortest day. After that period, as the sun daily shines upon us longer and rises higher, the snow and the ice gradually melt under his influence ; the earth, during the night, gradually retains more and more of the heat that it has acquired during the day, until the buds and flowers of spring burst upon us in all their beauty. The heating process still continues to go on ; the earth, for some weeks after the longest day, retains, during night, some of the heat it has acquired during the day, and the summer is in its full glow during the last days of July and the early part of August.

In our country, which has a proverbially changeable climate, arising chiefly from its insular situation, there is a

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considerable irregularity in the seasons—chilly days sometimes occurring in the midst of summer, and mild days during the depth of winter ; but, in some portions of the earth, much greater regularity in this respect takes place. In the tropics, the setting in of the rainy season can be foretold almost to a day.

The wonderful and beautiful means which the All-wise and All-merciful Creator has employed in bringing about the changes of the seasons, can be but slightly glanced at here ; but all can feel their influence, and appreciate their effects. Who does not see, with all the joy of hope, how gradually spring brightens into summer ? Who is there that has not indulged the pensive pleasures of memory as autumn slowly fades into winter ? But not the less of wisdom and beauty is there in the rougher moods of nature. Consider how, first the formation, and then the melting, of snow and ice, soften the ground, break up the hard clods of the valley, and prepare it for the coming spring—how the blustering winds of March dispel the

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damps and mists that hang about the earth, and, as they swing to and fro, the yet leafless trees of the forest shake off the dead and cankerous boughs, that would impede the growth and vigour of the bursting buds—how the thunderstorms of autumn, and the keen blasts of winter, purify the air, destroy noxious insects, and, by checking a too luxuriant growth, give vigour to all life, animal and vegetable !

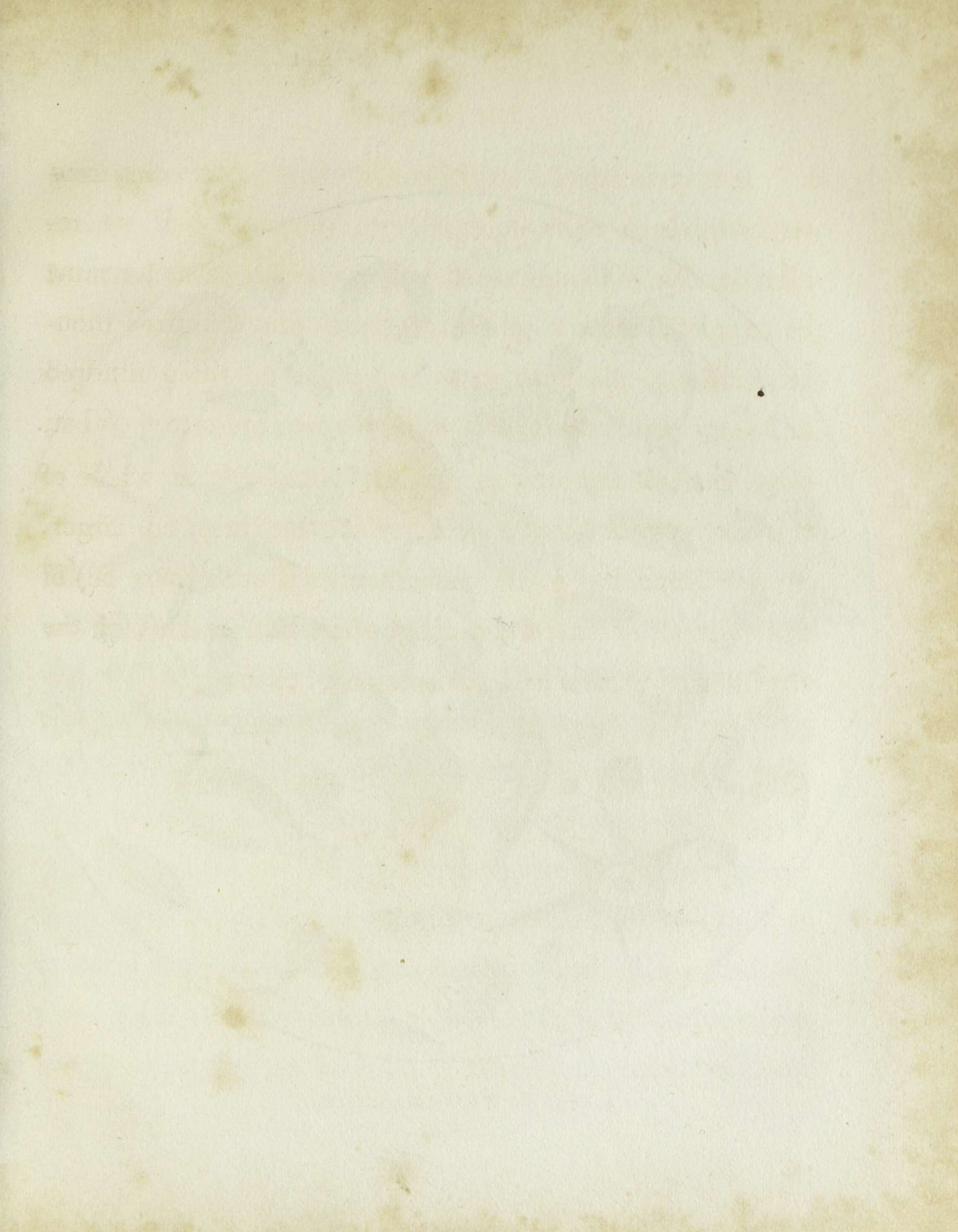
In looking at astronomical diagrams, we should remember that, after all, the best and most accurate can give but a very inadequate idea of the magnitude of the heavenly bodies, and of the enormous distances at which, when compared even to that magnitude, they are placed from each other. Sir John Herschel has given a familiar but striking illustration of the comparative sizes and distances of the bodies in our solar system, which we can hardly do better than insert here:—"Choose any well-levelled field or bowling-green. On it place a globe, two feet in diameter: this will represent the Sun. Mercury will be represented by a grain of mustard-seed on the

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circumference of a circle, one hundred and sixty-four feet in diameter, for its orbit; Venus, a pea, on a circle two hundred and eighty-four feet in diameter; the Earth, also a pea, on a circle of four hundred and thirty feet; Mars, a rather large pin's-head, on a circle of six hundred and fifty-four feet; Juno, Ceres, Pallas, and Vesta, grains of sand, in orbits of from one thousand to one thousand two hundred feet; Jupiter, a moderately-sized orange, on a circle nearly half-a-mile across; Saturn, a small orange, on a circle of four-fifths of a mile; and Uranus, a full-sized cherry or small plum, on the circumference of a circle more than a mile and a half in diameter. To imitate the motions of the planets in their orbits, Mercury must pass through a space equal to its diameter in forty-one seconds; Venus, in four minutes, fourteen seconds; the Earth, in seven minutes; Mars, in four minutes, forty-eight seconds; Jupiter, in two hours, fifty-six minutes; Saturn, in three hours, thirteen minutes; and Uranus, in five hours, sixteen minutes."

THE SEASONS.

“ It may assist us,” says Dr. Carpenter, “ in comparing this miniature representation with the reality, if we remember that the pigmy globe of two feet in diameter must be expanded into a sphere of nearly nine hundred thousand miles in diameter, or to two thousand three hundred and forty-eight and a half *million* times its size. What, then, must be the orbit of Uranus? And yet the whole of this vast system is but a point in the universe, no larger, in the estimation of the inhabitants (if such there be) of the nearest of the fixed stars, than the smallest of the satellites of Saturn or Uranus appears to us.”





A DROP OF WATER MAGNIFIED.

PEEPS THROUGH THE MICROSCOPE.

WHEN we contemplate the magnitude and distances of the heavenly bodies, we are overwhelmed with astonishment and awe; and as we turn from the glories revealed to us by the telescope to the wonders exhibited by the microscope, we are ready to sink into dust at the comparison of our own utter insignificance. "Surely," we say, "such pigmy insects as *we* are can never occupy a moment's care from that awful Being who has framed the boundless wonders of the heavens—who has scattered, like gold-dust, throughout the immeasurable depths of space, worlds upon worlds, compared to the least of which our earth, with all

PEEPS THROUGH THE MICROSCOPE.

its inhabitants, its “everlasting hills,” its rivers and its seas, is but a speck in creation. Surely, we are tempted to say, the very existence of such a mere atom as man must be forgotten by Him whom the very heaven of heavens cannot contain. We think only of the greatness of His power : we forget the greatness of His goodness—we forget, perhaps, that weak and insignificant as we are, there are myriads of living creatures swarming around us, each one framed with the nicest skill—each endowed with capacities of enjoyment—each having some service to perform in creation—whose very existence was unknown to us, until the microscope gave to the human eye some ten thousand times the power of vision it possessed before. By its means we find fresh proofs of that which the Book of Inspiration has already taught—proofs that the same Divine power, wisdom, and benevolence which bade to roll in glory and brightness, through myriads of ages, suns mightier far than that which illumines *our* sky, disdains not to contrive and to provide for the pleasures of the

PEEPS THROUGH THE MICROSCOPE.

smallest insect, that sports for an hour in the summer's light, and then dies.

“Will He not care for you, ye faithless? Say,
Is He unwise, or are we less than they?”

Yes,—every tiny leaf, every drop of water, is a world in which multitudes of God's creatures are born, with frames of workmanship as curious and as wondrous as ours; and there they live and sport with evident enjoyment throughout their little day, fulfil the end of their tiny being, and then give way to new generations. Look at this cut!—it represents a single drop of water, such a drop as may be hung trembling upon a pin's point—aye, one that, as it glitters in the light, seems to the naked eye pure and free from any mixture of substance in its clear fluid; and yet it swarms with life in many forms. Looking through a powerful microscope at that tiny drop, we may see creatures of shapes like those depicted there, and many more besides; but all endowed with power of

PEEPS THROUGH THE MICROSCOPE.

motion evidently voluntary, either in frolic gambol or in search of food. As we watch their movements, fresh forms appear and disappear to make way for new generations, which quickly perish in their turn. Even for the pleasures and the needs of beings such as these, whose universe is a drop of water, God provides ; and shall He not care for us ?

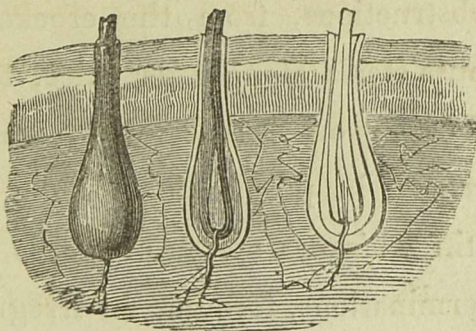
The microscope strikingly exhibits the superiority of the works of nature over those of art. Examined through its magic lens, the finest, the most delicate engraving looks coarse and harsh—lines meant to be smooth and accurate, appear rugged and distorted—its most carefully measured spaces are found to be grossly incorrect and unequal—the finest needle that man can make appears as rough and pointless as the kitchen poker—the most delicate tissue of silk or lace presents the appearance of an irregular and confused assemblage of rough hempen cables.

On the other hand, examine the leaf of a tree ;—every line is true and perfect ; the net-work that forms its

PEEPS THROUGH THE MICROSCOPE.

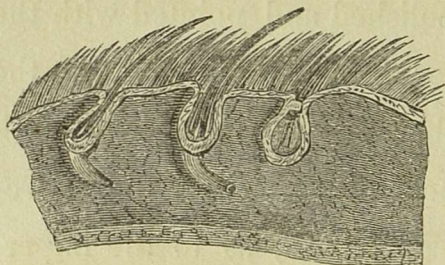
frame shows that the intention of the Artificer is fully carried out, in reality as well as in appearance ; the sting of a wasp appears through the microscope, as to the naked eye, a smooth shaft, polished and pointed with the nicest accuracy ; the gossamer thread that floats on the breeze proves to be an assemblage of the finest lines, each individual of which is as fine and smooth in the microscope that magnifies a thousand times, as to the imperfections of our natural vision appears the cluster formed by their union.

The hair of our heads is found to be a tube growing from a bulbous root sunk into the skin, and deriving its nourishment from the body, just



as vegetable bulbs do theirs from the earth. In fact, the hair appears to have a principle of life independent, in some degree, of the rest of the frame, as if it were a

vegetable rather than an animal substance ; for there are well-authenticated instances of the hair of the head and beard growing to a considerable length after death.



Whiskers of a Lion.

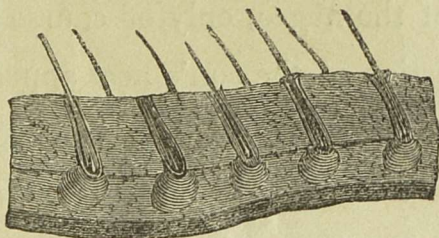
The whiskers of a lion, as well as those of the cat tribe in general, have an office distinct from that of ordinary hair in general.

Those animals creep stealthily on their prey in the dark, frequently amid many obstructions, from the crockery-crowded shelves where puss steals along after mice, to the tangled jungle of an African or Asiatic forest, where the lion or the tiger crouch in preparation for the deadly spring. The long, stiff whiskers spring outwards from the muzzle, and their terminations, forming an irregular circle at least equal to the space occupied by the body of the animal, come in contact with any object in the neighbourhood, and give warning to the creature to avoid alarming the prey of

PEEPS THROUGH THE MICROSCOPE.

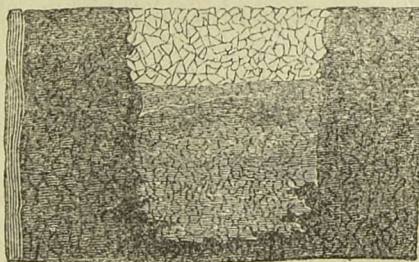
which it is in pursuit, by any noise. They are, in fact, feelers with a high degree of sensibility, being inserted into the skin not by a broad bulb, but by a stiffer and sharper root, so as to press more decidedly upon the nerves, and give the animal speedy and accurate intelligence of its approach to any object, and its shape and direction.

The bristles of a hog have their origin in a sheath rising from a small papilla. This papilla is full of an oily secretion, and it is this which, by keeping the skin when prepared after the animal's death, soft and lissome and impervious to moisture, makes a pig's skin so well adapted for saddles.



Bristles of a Hog.

The skin of a negro seems admirably fitted for the burning climate he inhabits. It is very smooth, and feels always much cooler than that of a white man under



Skin of a Negro.

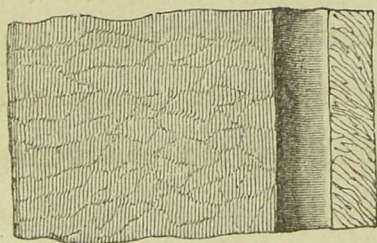
the same circumstances. This appears due to the minute vessels which pervade it, and which, by the dark fluid they contain, give to the negro his distinguishing colour. The freckles caused in persons of very fair complexion by exposure to the sun, and the tan or sun-burn in those of a darker hue, arise from the same cause as the dark colour of the negro, only of course in a much less degree. The action of the sun's heat appears to stimulate the net-work of small vessels that pervade the skin, thus causing them to discharge an increased secretion of carbon.

Dr. Carpenter says, "In most parts of the human skin which are liable to rub against each other, we find a considerable number of *sebaceous* follicles, which secrete a fatty substance, that keeps the skin soft and smooth. These are abundant on the most exposed parts of the face, and their secretion prevents the skin from drying up and cracking, which it would be liable to do under the influence of sun and air. They are more numerous in the skins of negroes, producing in them the oily sleekness for which they are generally remarkable, and which prevents

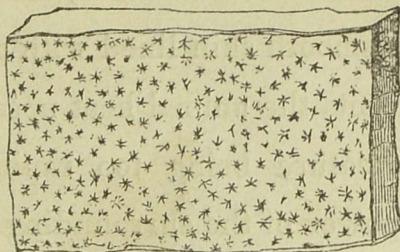
PEEPS THROUGH THE MICROSCOPE.

their skins from suffering by exposure to a tropical sun. It has been lately discovered, that even in persons of cleanly habits, each of these follicles is the residence of a minute insect, closely resembling the cheese-mite."

The skin of the camel and that of the porpoise are widely different in character, but each adapted for the circumstances and situation of the animal which it covers.



Skin of the Porpoise.



Skin of the Camel.

The porpoise, like the whale, being a warm-blooded animal, and frequenting the seas of different and changing climates, requires complete protection from the great and rapid changes of temperature to which it is exposed. It

PEEPS THROUGH THE MICROSCOPE.

is evident that a covering of fur or hair, the usual means of protection from cold bestowed upon land animals, would greatly impede the progress of creatures intended, like the whale, the dolphin, and the porpoise, to move rapidly through such a resisting medium as water. The two objects, protection from alternations of heat and cold on the one hand, and on the other, a smooth unctuous surface, from which the water may glide without being absorbed or attracted, are both attained by the adoption of a smooth skin lined with a thick coating of fat, which prevents the animal heat necessary to the constitution of the creature being too rapidly lowered by the conducting power of the surrounding water.

Contrasted with this, the camel is destined to inhabit the dry hot countries of Eastern and Central Asia, and to traverse deserts whose light sands are frequently whirled and driven in a stifling cloud which penetrates every object it meets. As a protection from this, the camel's skin is hard and tough, covered with a few thin scattered

PEEPS THROUGH THE MICROSCOPE.

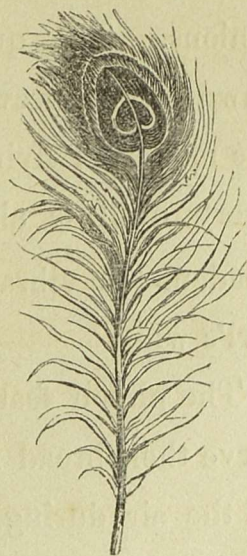
hairs, except in particular places, where it grows in tufts ; and in those parts of the body and limbs which support the animal when it kneels or lies down, the skin is thickened into callosities that resist the weight that presses upon them.

Feathers of the

These feathers are represented, not as microscopic objects, but as they appear to the naked eye. They are admirable examples of their class, and well exhibit the difference between a wing and a tail-feather. The owl is well known to be



Owl.



Peacock.

a bird of prey which seeks its food,—small birds, mice,

PEEPS THROUGH THE MICROSCOPE.

rats, and reptiles,—by night. It skims along the hedge-rows and by the farm buildings so noiselessly, that the timid little creatures it seeks are not aware of its presence till it pounces upon them. This smooth, noiseless flight, so different from the loud flapping of wings caused by birds of other habits and pursuits, (rooks and pigeons for instance,) is obtained by the peculiar formation of its pinions. The quills are covered beneath with a fine down, which prevents their rattling one upon another in the motion of flying, and the plumage lining each side of every quill is also edged with a smooth down, which deadens the vibration of the air under the stroke of the owl's wing.

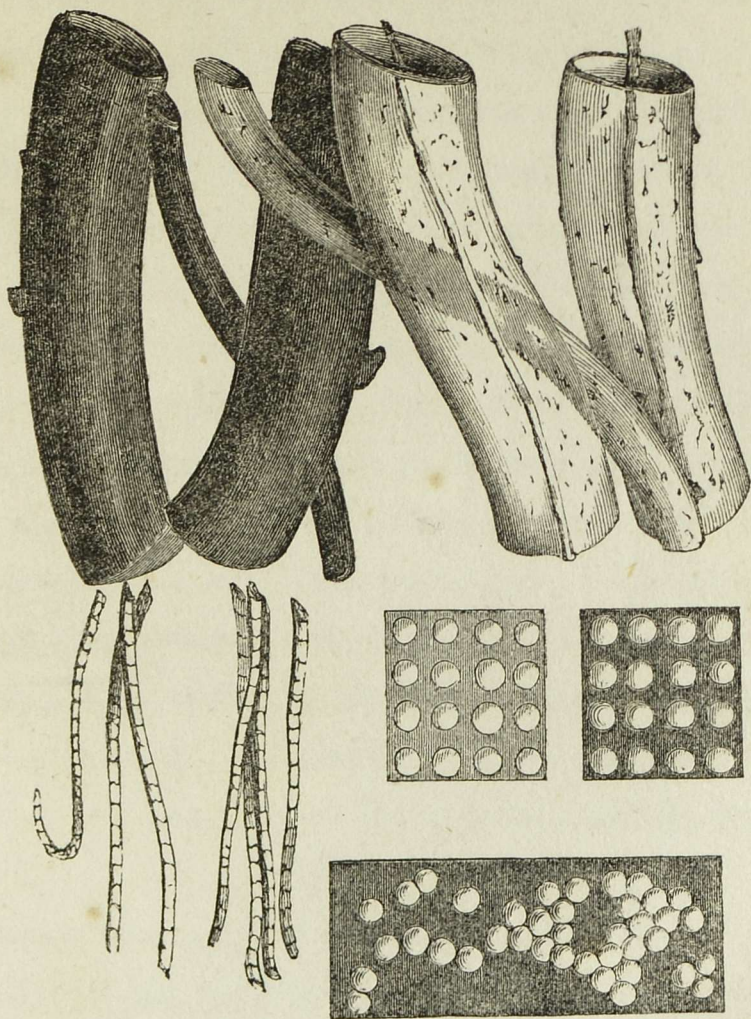
The pinion feathers of most birds are enabled to preserve their broad fan-like form, in spite of the resistance of the air during the rapid and powerful action of the bird in flying, by means of an edging, both serrated (or saw-like) and hooked, by which each separate filament which forms the van of the feather is locked into the one

PEEPS THROUGH THE MICROSCOPE.

on each side of it. Any one may see an example of it by examining the feather of a common goose-quill. The tail feathers of the peacock, which are not used by the bird in flying, do not require this serrated edging, but hang loosely and gracefully from each other, until meeting at the "eye," they there form the smooth, glossy assemblage of brilliant colours for which the peacock is so conspicuous and so well known.

THE BLOOD AND HAIR.

THE good King David says, "I am fearfully and wonderfully made;" and he praises God for it. You have perhaps thought, that the blood of your body was all one sort of substance; and may be surprised when you are told, that it consists of several very distinct substances, much unlike each other. Soon after a portion of blood has been taken out of the body, it separates into two parts, a thin transparent fluid, and a dark solid substance, almost like flesh. After a short time longer, this solid again divides into a soft white elastic matter, and an immense number of exceedingly small red globules or balls. These cannot be distinguished without a microscope; but with



HUMAN HAIR AND GLOBULES OF BLOOD MAGNIFIED.

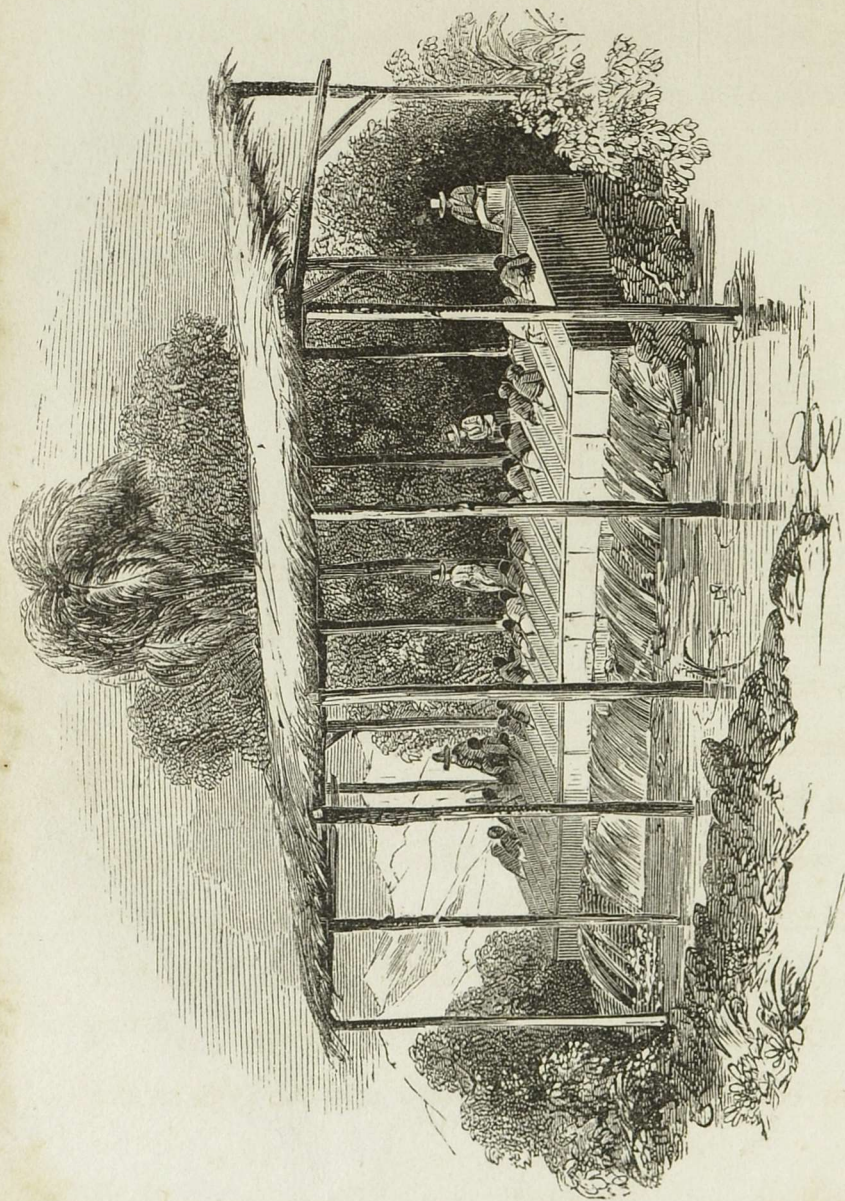
THE BLOOD AND HAIR.

that instrument, they are seen to be transparent in themselves, and covered with a red skin. Now, all the parts of the body, the spittle, the tears, milk, and even the hardest parts, the hair, the nails, the bones, and the teeth, are made from the blood; and as all these parts are composed of a great number of *fibres* or threads, twined together, it is believed that these threads are made by a number of globules joining together in a line. You may see these fibres in flesh, by taking a very small piece of lean meat that has been much boiled, and pulling it apart, when it will all separate into threads. The upper part of the engraving shows these things: at the right hand are some fibres much magnified; at the top are some globules becoming joined together to form the fibres, and below are two sets of globules, one set with the red skin, and the other without it.

The larger figures below represent the structure of the hair, which is not less curious. Every hair is a slender tube, which has a swollen part at the bottom, like the

THE BLOOD AND HAIR.

bulb of a flower, by which it is held in the skin. In young people, this tube is filled with soft dark-coloured matter, which gives the tint of the hair; this is shown in the right-hand figures: but when persons grow very aged, the colouring matter shrivels up into the form of a dry pith running through the middle, and then the tube is seen to have no colour of itself, but appears of a silvery white. This is represented in the three figures at the left hand. Thus we see that our Heavenly Father has displayed his wondrous wisdom, in making these poor bodies of ours; and this should teach us to love and to confide in Him; for, as the Lord Jesus says, "Even the very hairs of your head are all numbered."



DIAMOND WASHING.

THE DIAMOND.

It is somewhat difficult to give a perfectly satisfactory reason why mankind should attach so high a value to the diamond. We may mention its brilliancy when polished, its hardness, and its rarity ; but the possession of these properties to any conceivable extent seems hardly sufficient to account for the enormous sums which have been given for a stone, of which the largest known specimen in existence weighs only eleven ounces. For instance, the Pitt diamond was purchased by the Regent Duke of Orleans for £135,000 ; the Pigott diamond was valued at £40,000 ; that of the Queen of Portugal, weighing eleven ounces, has been valued at £425,000 ; and the gem in the

THE DIAMOND.

sceptre of the Russian empire, about the size of a pigeon's egg, was bought for nearly £150,000.

It is true that the value of gold and silver (and indeed of everything else) is equally dependent on their comparative rarity; but those metals being in constant use as universal and most convenient media of exchange, and standards of comparative value for all other articles, the estimation in which they are held seems less capricious and artificial.

And after all, what is a diamond?—Nothing but a piece of crystallized carbon. And if—as seems not at all impossible—some fortunate chemist should succeed in thus imitating the process of nature, by subjecting charcoal or carbon to some process which shall cause crystallization, we may have diamonds worth but little more than bits of very fine glass. Till then, however, this gem will probably retain its place in the estimation of the royal, the noble, and the wealthy—will still flash around the diademed brows of sovereigns, and descend, from generation to generation, with the other ancestral honours of the peerage

THE DIAMOND.

—the deer-stocked park, the princely mansion with its surrounding woods, and the rent-roll of a province.

Diamonds have been principally found in India and the Brazils. The mine of Golconda in India, so proverbially celebrated, is now nearly exhausted, and it is by the Brazils that the principal supply of this precious stone is at present furnished. The most celebrated diamond mines in this last-named country are those of Serrado Frio, which district is also known as the Arrayal Diamantino, or Diamond District. It is surrounded by rocks almost inaccessible, and was formerly so strictly guarded, that even the governor of the province was not allowed to enter without the special permission of the director of the mines.

The diamonds are found imbedded along with flints, in a ferruginous earth, called cascalhao, which is dug, and taken to be searched for the precious stones, by filtering through a running stream. The earth is dug during the dry season, when the beds of rivers and torrents are dry, and

THE DIAMOND.

the diamond sand can more easily be obtained. When the rainy season commences, the negroes are employed in washing the cascalhao. This is generally performed (as shown in the cut) under sheds, for the protection of the workmen from the weather. Along the sheds are placed raised seats for the overseers, each of whom watches eight negroes, as they search for diamonds among the sand and flint of the cascalhao, as it is washed by the stream that runs through the shed. Each negro works in a separate box, and is entirely naked, except during extreme cold, when he is allowed a waistcoat, without either lining or pocket, lest he should secrete a diamond when found. He is furnished with a kind of hand-spike, to separate the sand and flint, and when he discovers a diamond, he stands upright, and claps his hand as a signal to the overseer, and then looks anxiously on while it is weighed and examined. For if the poor fellow has been fortunate enough to find a diamond weighing seventeen carats, he is freed from slavery, amid much ceremony and rejoicing. He is

THE DIAMOND.

crowned with a wreath of flowers, and carried in procession to the administrator, who pays his owner for him, and sets him at liberty. The discovery of a stone of less weight is also rewarded by gifts and premiums, according to the value of the gem, down even to a pinch of tobacco.

The diamond, when thus discovered, is deposited by the overseer in a large wooden bowl of water, hung in the middle of the shed ; and, at the end of the day, the whole are collected, weighed, and registered, before delivering them to the proprietor.

Notwithstanding every imaginary precaution to prevent thefts, the negroes find means to purloin and secrete diamonds, and afterwards sell them at a low price to the smugglers : and these, in their turn, are often deceived by the negroes, who, by some simple process, can give crystals, of but little value, the appearance of rough diamonds, so as completely to imitate them.

It is supposed that about 20,000 negroes are now

THE DIAMOND.

employed in the diamond-mines of Brazil. But, after all, the diamond is a product of far less value to this country than might be supposed. It has been estimated, from a careful calculation, that the total value of the diamonds discovered during *eighty years*, from 1740 to 1820, was about £3,475,537. This amount, in only *eighteen months*, is exported from the Brazils in sugar and coffee only. One-fifth of the total value of the diamonds found belongs to the crown. From the mines the diamonds are conveyed to the capital on mules, and escorted by a strong guard of soldiers.

The hardness of the diamond is proverbial, and to this quality it owes its chief, if not its sole utility. By no other substance than a diamond can one of these gems be scratched or ground. To do this is the business of the lapidary, and great patience, skill, and taste are required in grinding down the natural rough and irregular surface of the stone, into such a regular, geometrical shape, as shall least diminish the weight and size of the gem, and

THE DIAMOND.

at the same time shall best display its lustre when polished, and reflect the varied light from its brilliant faces.

Great expense is sometimes incurred in thus preparing these gems for the goldsmith, whose business it is to fix them, or “set” them, as it is termed, in appropriate mountings—such as rings for the finger; the locket for the wrist; the crown and sceptre of royalty; or the sword-hilt of the fortunate soldier.



RISE OF THE RIVER THAMES.

HERE we have a view of the bubbling fountain-head which gives birth to the river, whose gentle stream, narrow and insignificant as it may be, compared with others, bears on its smooth surface a richer freightage, and a far more numerous fleet, than any other of the wide world's waters.

The source of the Thames lies among the Cotswold Hills, which run in a direction north-east and south-west through Gloucestershire. These hills rise abruptly from the rich valley of the Severn, in bold ridges, which, in the southern portion of their range, are clothed, from their base to their summit, with overhanging woods of beech, save here and there, where some opening in the woods



SOURCE OF THE THAMES.

RISE OF THE RIVER THAMES.

leaves exposed the limestone cliff, contrasting, by its light hue, with the dark surrounding mass of foliage and boughs.

Immediately beyond this ridge and the winding valleys, (each with its clear running stream,) which everywhere deeply indent the range of hills, the country suddenly loses its rich and romantic aspect ;—we leave the woods and the deep glens, in the recesses of whose twilight sparkles the merry running water, where the trout leaps and the dragon-fly glances, and emerge upon a high, open table-land, bleak and bare of trees, and divided by rough stone-walls. And in this high table-land, thus rising over the Vale of Severn, is born her sister river, whose winding stream is as gentle and as clear, and as equal in its depth and in its flow, as the other, rushing onwards from the lofty mountains of North Wales, is swift and turgid, and abounding with shoals.

At Lechlade the Thames first becomes navigable for barges, and from this point to London Bridge the distance,

RISE OF THE RIVER THAMES.

following the windings of the river, is nearly one hundred and fifty miles.

As it flows on towards Oxford, it is augmented by several tributary streams, the principal of which are the Windrush, flowing by Burford and Witney, and the Evenlode, rising near Stow in the Wold. From Oxford, the Thames runs southward by Abingdon and Wallingford, till it approaches Reading, where it is joined by the Kennett, and a little further down, by the Loddon. Then, sweeping northward, and then again eastward and southward, in many a bold, winding reach, it passes Henley, Great Marlow, and Maidenhead, between beautifully wooded cliffs, or among rich pastures, until it reflects the royal and bannered towers of Windsor, and the classic hall of Eton. Between Staines and Kingston it is joined by the Coln, the Mole, and the Wey, and soon afterwards, at Teddington, (probably a corruption of Tide-end-town,) feels the alternate ebb and flow of the ocean tide. From Richmond and Kew, it flows on in a direction nearly due

RISE OF THE RIVER THAMES.

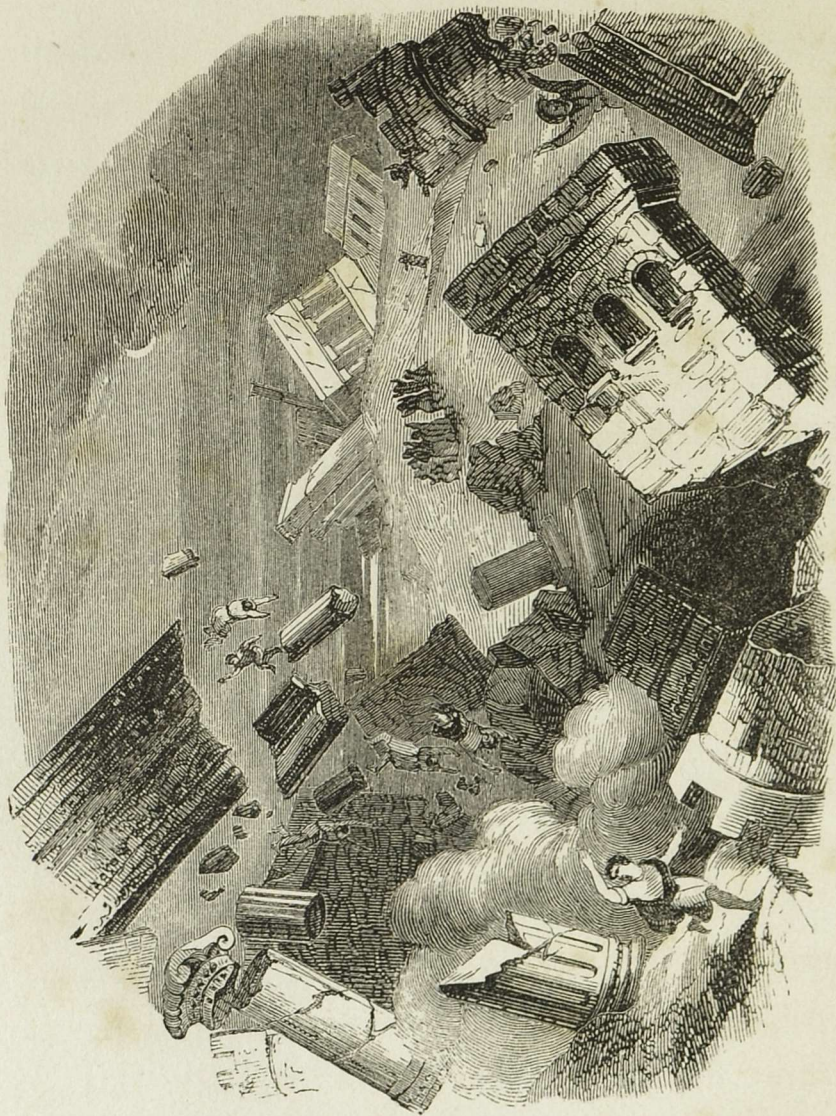
east, until it reflects the many shadows of the great metropolis:—temple, and tower, and bridge—warehouse, and wharf, and pier—the busy, restless crowd of vessels, ever shifting and gliding—and, over all, the never-ceasing cloud of smoke, which dims the pale blue of our English skies, even on the brightest summer's day. But London and its wonders it soon passes, and leaving them behind, the river glides onwards, past dock-yard and arsenal, the naval hospital, and the far-famed observatory of Greenwich, with the marshes of Essex on its left bank, and on its right, the wooded knolls and pleasant orchards of Kent. There, Tilbury Fort sends us back to the days of Elizabeth and the Spanish Armada, and the great names of Burleigh and Walsingham, Drake and Raleigh; here, Gravesend, with its crowds of citizens, rejoicing in their temporary exchange of the smoke of rival steamers for that of the Great City, and the bustle and noise of holiday-making for that of business, recalls our thoughts to the present hour. A few miles onward, and the river

RISE OF THE RIVER THAMES.

widens into an estuary, which receives the waters of the Medway; and the united streams, gradually receiving, as their shores recede, the swell of ocean, mingle their waters with his, and take his name.

Thus, Time, as he rolls onwards, is lost in the depths of eternity, to which we, like barks upon the river, are ever hastening. Happy they who have committed the guidance of their souls to Him who rules the winds and waves, and who, amidst all the storms and trials of life, can smile and say,

“ My Father’s at the helm ! ”



EARTHQUAKE AT LISBON

THE EARTHQUAKE AT LISBON.

AMONG all the phenomena of nature few appear to be attended with such horrible consequences as earthquakes. Thousands, who but a few minutes before were full of busy life, have been swallowed up as if they had never existed, or crushed to death by fragments of falling buildings.

On the 1st of November, 1755, Lisbon was visited by the most tremendous earthquake that has been known in modern times. It happened to be a festival day. The churches were lighted up, and particularly crowded; when, suddenly, a sound was heard like thunder, in the very heart of the earth, and before the terrified inhabitants could conjecture what was going to happen, a violent shock threw down the greater part of their city, burying

THE EARTHQUAKE AT LISBON.

more than 60,000 of them in the ruins : and for all this the space of six minutes was sufficient ! It is impossible, in so small a picture as this, to give a just idea of the horrors of such a scene.

By this time the sea was violently agitated, and, after sweeping back so as to leave the bar almost dry, it came swelling and rushing with tremendous force towards the devoted city, and rising more than fifty feet above its usual level. Close to the water was a large marble quay, upon which great numbers of the survivors had crowded for safety, when (as if there was to be no refuge for those against whom this awful doom had gone forth) the quay went down ; and all that agony of hopes and fears, and of horror unspeakable, vanished in a moment, and not a trace of the quay, or of those who had flown to it for shelter, were ever seen afterwards.

Those who had hurried into boats on the Tagus met with no happier fate : they sunk in the whirlpool occasioned by the earthquake.

THE EARTHQUAKE AT LISBON.

Lisbon has never recovered from the effects of this disaster ; the few handsome streets which have been rebuilt only seem to show, in more melancholy contrast, the heaps of rubbish and ruins which were left ninety years ago ; and the imposing appearance of palaces, churches, and convents, which rise above the quays on approaching the city from the river, creates a delusion which quickly fades away when the badly-paved and dirty streets offend the eye of the English traveller. To complete his disgust, he is almost sickened with pestilential effluvia, and annoyed by swarms of dogs of every breed, with which the streets of Lisbon are as much infested as those of Corinth or Constantinople.

Notwithstanding the efforts which some influential people have made to restore their city, so as to justify its ancient name of "Felicitas Julia," the greater part of it must still retain its reputation for want of decency and cleanliness:—the imperfect lighting of the streets, the want of sewerage, and the extreme indolence of the

THE EARTHQUAKE AT LISBON.

Portuguese, all combine to give it this most undesirable celebrity.

Their government is bad, and there is a total want of education among the lower orders. Mr. Semple describes them as “a meagre race, generally clothed in rags, and filthy beyond endurance.”

Lord Byron's description appears admirably just:—

“ Whoso entereth this town
That, sheening far, celestial seems to be,
Disconsolate will wander up and down
'Mid many things unsightly to strange 'ee;
For hut and palace show like filthily.
The dingy denizens are rear'd in dirt;
Ne personage of high or mean degree
Doth care for cleanness of surtout or shirt,
Tho' shent with Egypt's plague, unkempt, unwash'd; unhurt.”



TIGER HUNT.

TIGER HUNTING.

SOME of the wild animals, in most countries, are much stronger than man, yet by the power of reason which God has given to him, he has been able, not only to conquer and destroy such as were dangerous, but even to tame and train those whose strength or swiftness were useful to him. The elephant is the largest and strongest of all land animals, yet he is caught in various ways ; and though very savage and furious when he first finds himself a prisoner, he soon becomes reconciled by kind and gentle treatment, and proves a very faithful and obedient servant. One of the purposes for which the elephant is used in the East Indies, is the hunting of the fierce wild beasts that

TIGER HUNTING.

inhabit that country, and particularly the tiger, the most beautiful, but the fiercest of them all. Whenever a tiger is known to be in the neighbourhood, several gentlemen will make up a party, armed with guns. On the appointed morning, they mount their elephants; sometimes riding as on horseback, but more usually, two or three persons in a sort of a car, called a *howdah*, strapped upon the elephant's back. A native always sits on the neck to guide the animal, and thus they proceed to the jungle, that is, high grass and thick bushes, where the tiger is supposed to be lurking. At first it is difficult to get sight of him, for he sneaks about with his belly close to the ground, hoping to lie concealed, for he does not like the look of so many elephants. The dogs, however, beat about among the bushes, and presently a waving of the grass is seen, and one of the party catches a glimpse of the black stripes upon his glossy yellow back. Now is the time to fire. Ah! the ball has struck him and entered his side! Now rage takes the place of fear; with a furious cry, some-

TIGER HUNTING.

thing between a scream and a roar, he bounds towards the nearest elephant, endeavouring to seize him by the trunk. The elephant, however, is prepared for him; he holds his trunk high up in the air, as that is a very tender part, and tries to catch the tiger on one of his tusks. If he succeeds, the affair is soon settled; the tusk pierces him through and through; and he is then shaken off and trampled into the very earth, by the broad feet and knees of the elephants. Sometimes, if the elephant is young, it gets frightened and turns away at the moment that the tiger bounds; in this case it is very likely that the savage beast alights on the elephant's side. The riders are now in a very awkward position; for if they cannot immediately shoot him, one of them may be seized by his terrible jaws and dragged off. But the motion of the frightened elephant prevents the tiger from feeling quite at home, and he is usually soon dislodged, and several guns being pointed at him, his beautiful skin is pierced with many fatal wounds. The slaughter of a tiger causes much joy

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in the neighbouring villages, as he is a very destructive animal, often taking away human life, as well as that of the cattle; and therefore the hunting of such a creature is a laudable and proper employment, which is more than can be said of any kind of hunting practised in this country.

There are other methods of killing this fierce wild beast, practised by the natives of India, some of which are quite amusing. "The track of a tiger being ascertained, the peasants collect a quantity of the leaves of the *prou*, which are like those of the sycamore, and are common in most underwoods. These leaves are smeared with a sort of birdlime, and are then strewed with the gluten uppermost, near to that opaque spot to which it is understood the tiger usually resorts during the noontide heat. If by chance the animal should tread on one of the smeared leaves, his fate may be considered as decided. He commences by shaking his paw, with the view to remove the adhesive incumbrance; but finding no relief from that expedient, he rubs the nuisance against his jaw, with the

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same intention, by which means his eyes, ears, &c., become agglutinated, (that is, uncomfortably closed up with the sticky substance,) occasioning such uneasiness, as causes him to roll, perhaps, among many more of the smeared leaves, till at length he becomes completely enveloped, and deprived of sight; in which situation he may be compared to a man who has been tarred and feathered. The anxiety produced by this strange and novel predicament soon discovers itself in dreadful howlings, which serve to call the watchful peasants, who in this state find no difficulty in shooting the object of their detestation.”

In some of the very large Indian islands, the inhabitants practise other modes of destroying this animal. Sometimes a pit is dug, and a strong sharp stake fixed upright in the bottom: a board is then laid over one edge, so as to tip over with the slightest increase of weight. A piece of flesh is laid on the end of the board, and weeds and light sticks are stretched across, so as to hide the pit

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from view. The tiger, attracted by the meat, walks along the board to reach it ; but the instant he gets beyond the edge of the earth, the board tips up with him, and he is instantly precipitated into the hole, and falling upon the sharp spike, is speared through the body, and is usually found dead.

At other times, a cage of strong wicker-work is constructed, large enough to contain a man. One of the natives then goes in the evening to the place where a tiger is known to resort, armed with a long knife, or dagger. He stations himself within the cage, and patiently waits till night. By and by the tiger, prowling about in the dark, scents the man, and proceeds to the place. He immediately rears up on his hind legs against the cage, with a terrific roar, when the man, nothing daunted, takes the opportunity to thrust his dagger into the creature's breast.

The muscular strength of the tiger is most prodigious, but his courage is not thought equal to that of the lion—as he rarely attacks openly any creature that is capable of

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resistance. Many dreadful tales are told by travellers in India of the ravages of these beasts—one occurs to us which may interest our young readers. “ We went, (says the narrator, an eye-witness,) on shore on Sanger Island to shoot deer ; of which we saw innumerable tracks, as well as of tigers. We continued our sport till nearly eight o’clock, when, sitting down by the side of a jungle to refresh ourselves, a roar like thunder was heard, and an immense tiger seized on one of our party, Mr. Monro, the son of Sir Hector Monro, and rushed again into the jungle, dragging him through the thickest bushes and trees, everything giving way to its monstrous strength : a tigress accompanied his progress. The united agonies of horror, regret, and fear, rushed at once upon us. I fired at the tiger ; he seemed agitated ; my companion fired also ; and in a few moments after this, our unfortunate friend came up to us, bathed in blood. Every medical assistance was vain ; and he expired in the space of twenty-four hours, having received such deep wounds from the teeth and

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claws of the animal, as rendered his recovery hopeless. A large fire, consisting of ten or twelve whole trees, was blazing near us at the time this accident took place, and ten or more of the natives were with us. The human mind can scarcely form any idea of the scene of horror; and we had but just pushed our boat from the shore, when the tigress made her appearance, almost raging mad, and remained on the sand almost all the time we continued in sight."

Success in hunting such animals as these, however dangerous, must always have the spice of utility, generally wanting in our field sports. Every tiger killed is not only the destruction of a ravenous beast, but possibly the conservation of many human lives.



LION AND TIGER FIGHT.

LION AND TIGER FIGHT.

UNTIL very recently it was the habit of naturalists to style the lion courageous, generous, noble, &c.; while the tiger was uniformly spoken of as bloodthirsty, treacherous, and relentless. This opinion became the generally received notion on the dispositions of these two beasts. Thus we find Thomson giving expression to the same sentiment:—

“The generous lion stands in softened gaze.”

The fact is, that they are beasts of the same tribe and much the same habits, and both lurk in secret to spring upon their prey, unless impelled by hunger to take bolder steps. Like the tiger, the lion usually slumbers during

LION AND TIGER FIGHT.

the day, and, as night sets in, he rises from his lair to prowl for food. He waits in ambush till anything passes by, or creeps stealthily towards his prey, and with a bound and a roar he strikes it to the ground; and when it is captured he soon appeases the craving of his hungry maw.

Tales are told, it is true, of persons making their escape from lions, and there are not as many told of their escaping from tigers, but still they are both ferocious and cruel, both possessed of amazing power, and they are the scourge of the country where they are found. India and its northern confines are the only countries where they are both to be met with, the tiger belonging exclusively to Asia.

Combats between these two fearful brutes are seldom known to occur; and, like two powerful kings, they dwell in friendly league to attack their weaker neighbours.

In olden time, when Rome was the first city on the earth, and the voice of her emperors was law to the known world, immense numbers of lions and tigers, with other

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wild animals, were captured and brought to the city alive, that they might fight for the amusement of the people. These were part of the games by which the good-will of the people was secured ; and to make them extravagant and splendid, no cost or labour was spared. The number of animals killed during some of these contests is almost past belief.

After Trajan's triumph over the Dacians, spectacles were exhibited, during which eleven thousand wild beasts were killed ; of lions alone, Pompey exhibited five hundred at once, which were all despatched in five days. The large amphitheatres were crowded with spectators to witness these horrid sights. Sometimes different animals would be matched with each other. Sometimes men, compelled or hired to fight, entered the arena to maintain the struggle. A lion from Africa would be matched with a tiger from Asia ; both creatures kept for some time without food, to make them more savage ; and, previously to the door of their dens being drawn up, goaded and singed

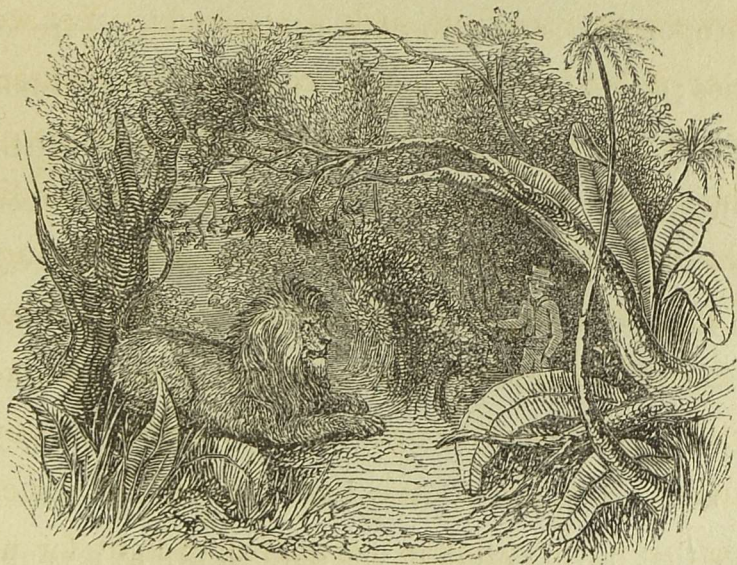
LION AND TIGER FIGHT.

by the keepers to excite their rage. At the given signal the dens were opened, and with an awful roar the infuriated beasts rushed into the arena. In a moment they were grappling fiercely with each other, their flesh torn by the sharp claws with which they are armed, and their jaws smeared with blood; while, louder than the shouts of approbation from the savage people, might be heard the more savage roar of these enraged brutes.

But we must turn from such a spectacle. Yet we cannot pass it by without calling to mind the thousands of Christians who, soon after the first preaching of the gospel, met their death in this way. "To the lions! to the lions!" was the cry raised whenever a Christian was brought to trial; and, sewn in sheep-skins, often they were thrown to these horrid beasts to be devoured; or, with a sword and a buckler, compelled to fight till they were overpowered and slain. Nay, the apostle Paul himself did not escape, but was, in all probability, compelled to fight for his life with wild beasts in the games at Ephesus.

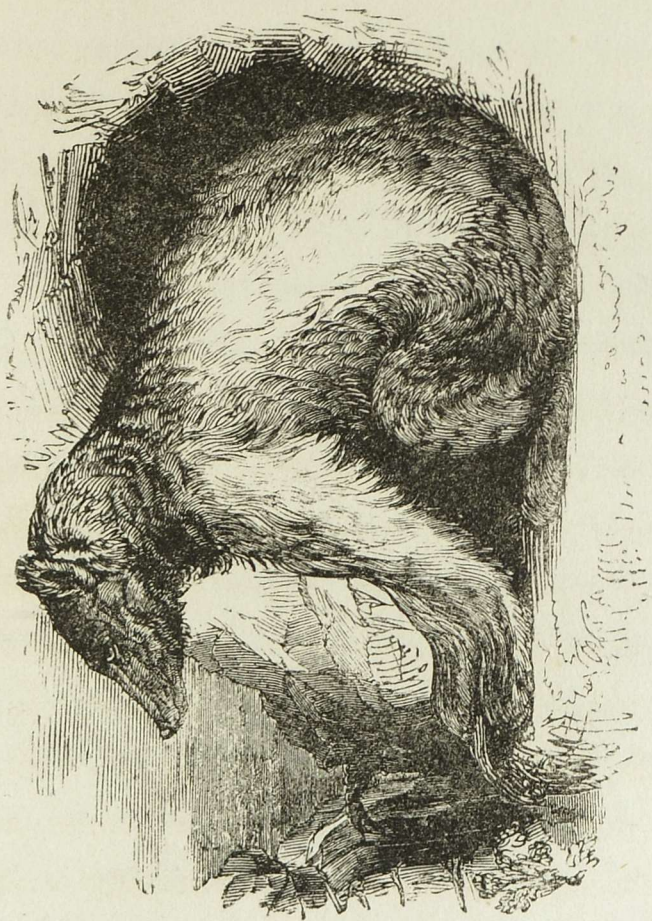
LION AND TIGER FIGHT.

As we look once more on the picture, where in bloody strife these beasts are contending, and connect them with the events to which we have alluded, it fills our minds with thankfulness, not only that we are delivered from such monsters in our own land, but also that the days of persecution have passed away, and bloodshed for the profession of Christianity is known no more.

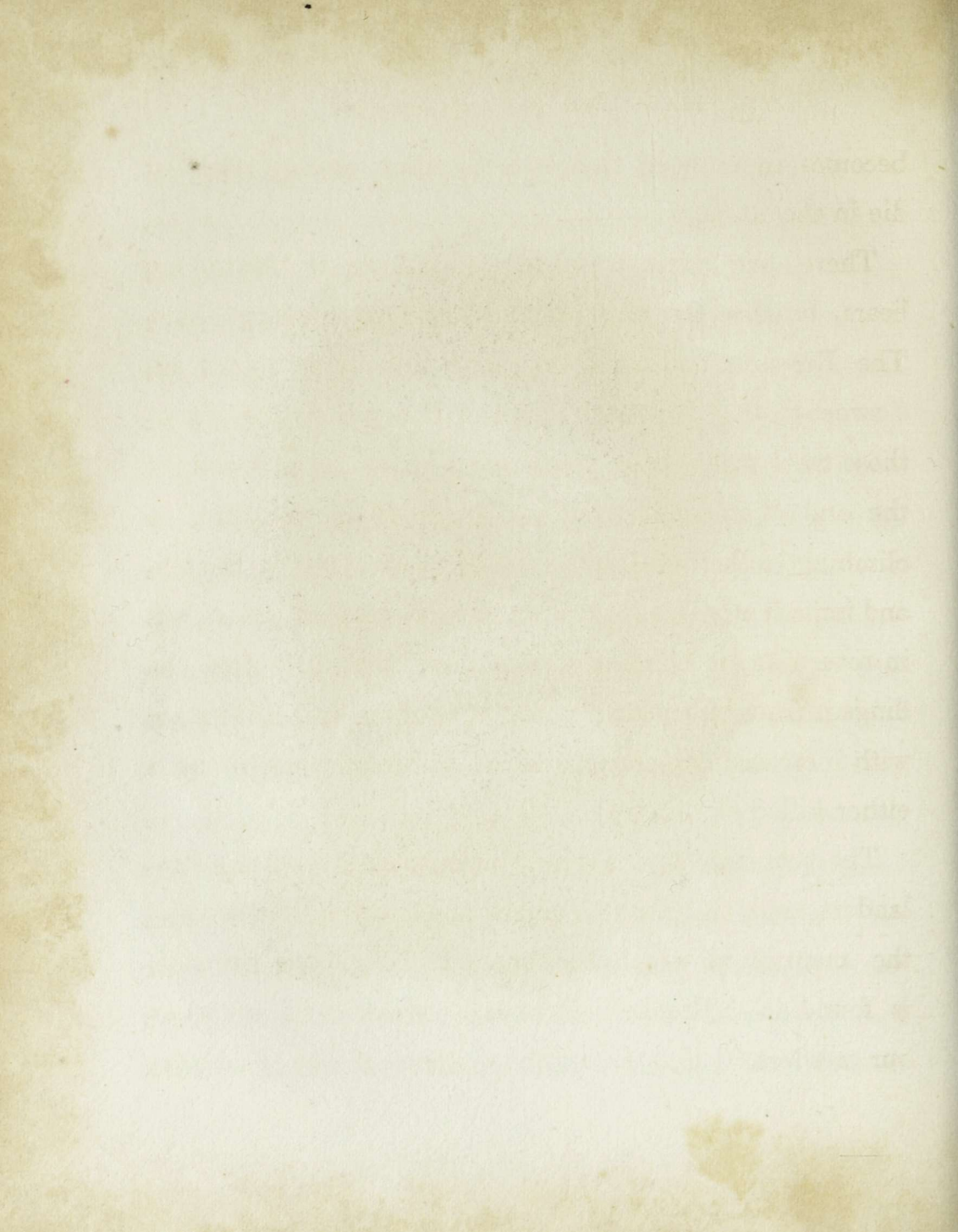


BEARS AND BEAR-HUNTING.

THE bear is a native of most of the northern countries of Europe, Asia, and also of America. There are several varieties; and though the habits of each may differ somewhat according to the circumstances of their existence and residence, yet there are certain characteristics common to the entire family of Bears. Their residences are either in the recesses of thick forests, or in caverns in mountains or cliffs; their disposition is savage, and owing to their great strength, they are formidable antagonists. The black bear is said to be so remarkably attached to its young, that the hunters never dare to fire at a young one while its parent is on the spot, for if the cub be killed, it



THE BEAR.



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becomes so enraged that it will either avenge itself or die in the attempt.

There are various modes of taking or destroying bears, besides the most common one of hunting them. The Russians endeavour to snare him by means of his "sweet-tooth." He is so fond of honey that they fix to those trees where bees are hived a heavy log of wood, at the end of a long string. The unwieldy creature, in climbing to the hive, finds himself interrupted by the log, and impatiently pushes it aside and attempts to pass it, but in returning, it hits him such a blow, that, in a rage, he flings it from him with greater force, which makes it return with increased violence ; and he continues this till he is either killed or disabled.

The bear-hunt is a favourite occupation among the Finlanders, and the native Indians of America. A sketch of the manner in which the chase is conducted by them is found in "Brooke's Travels," which will entertain our readers. The favourite weapon of the Finlander

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in hunting the bear is an iron lance, fixed at the end of a pole. At about the distance of a foot from the point of the lance is fixed a cross-bar, which prevents the instrument from penetrating too far into the body of the bear. When the hunter has discovered where the animal has taken up his winter-quarters, he goes to the place, and makes a noise at the entrance to his den, by which he endeavours to teaze and provoke him to quit his stronghold. The bear hesitates, and seems unwilling to come out ; but, on continuing to be vexed by the hunter, and perhaps by the barking of his dog, he at length gets up, and rushes in fury from his cavern. The moment he sees the peasant, he rears himself upon his hind legs, ready to tear him to pieces. The Finlander instantly puts himself in a position to repel the attack. He brings the iron lance close to his breast, concealing from the bear the length of the pole, in order that he may not be upon his guard, and parry with his paws the mortal blow which the hunter means to aim at him. The Finlander then advances

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boldly towards the bear, nor does he strike the blow till they are so near each other that the enraged animal stretches out his paw to tear his enemy limb from limb. At that instant the peasant pierces the bear's heart with the lance, which, if not prevented by the cross-bar, would come out at his shoulder; nor could the hunter, without this contrivance, prevent the animal from falling upon him—an accident which might be very dangerous. By means of a cross-bar, the bear is kept upright, and at last thrown upon his back. It is very extraordinary that the poor creature, feeling itself wounded, instead of attempting to pull out the lance with its paws, holds it fast, and presses it more firmly to its wounds.

Thus you see, that in attacking large animals like bears, the Finlander incurs considerable risk, as it is needful that he should approach very near to them to ensure a mortal wound, and thus disable them at once, or else the poor animals immediately turn upon their antagonist. The bear is held in some estimation all over Lapland and

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Finland. The natives treat him with a kind of respect and deference on account of his supposed sagacity and talents. It is a common saying among them, that the bear has twelve men's strength and ten men's understanding; and their superstitious ideas lead them to suppose that he perfectly comprehends their discourse. Thus a Laplander, being in pursuit of wild rein-deer with his rifle, suddenly encountered a bear; and, his piece missing fire, he addressed it in these words:—"You rascal, you ought to be ashamed of attacking a single man: stop an instant till I have reloaded my rifle, and I shall be again ready to meet you."

The American Indians adopt a mode of chase somewhat similar to the Finlander, except that he substitutes the rifle for the lance. The bear chiefly adopts for his haunts the hollow trunks of trees, which he climbs, and thus gains the interior from above. The hunter, whose business is to watch him into this retreat, climbs a neighbouring tree, and seats himself opposite to the hole. In one

BEARS AND BEAR-HUNTING.

hand he holds his gun, and in the other a torch, which he darts into the cavity. Frantic with rage and terror, the bear makes a spring from his station, but the hunter seizes the instant of his appearance and shoots him.

The great utility of the bear is sufficient to excite the avarice of man, apart from the mere *habit* of hunting him. His fat is all over the north esteemed as a savoury and wholesome food, and when melted supplies an excellent oil ; of his skin, beds, covertures, caps, gloves, collars for sledge-dogs, shoes, &c., are made. The Russians of Kamtschatka make use of his intestines, properly prepared, as window-panes, and their ladies use the same material for masks, to preserve their faces from the effects of the sunbeams, which, reflected from the snow, are found to blacken the skin ; and, lastly, of the shoulder-blade they make sickles for cutting grass.

So numerous are the wants of man supplied by a creature which we should be apt to regard as not only a savage

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enemy, but as a useless and frightful beast. It is scarcely possible, with such instances before us, to harbour prejudices against any of the creatures formed by the all-wise Creator, or to trust to first impressions concerning them.



STAGS FIGHTING.

STAGS FIGHTING.

At the very mention of the word stag, our mind reverts to Sir Walter Scott's beautiful description of one rising before the baying of the hounds; certainly one of the truest and most spirited pictures he ever drew.

“As chief, who hears his warder call,
‘To arms! the foemen storm the wall!’
The antler'd monarch of the waste
Sprang from his heathery couch in haste.
But, ere his fleet career he took,
The dew-drops from his flanks he shook;
Like crested leader, proud and high,
Toss'd his beam'd frontlet to the sky;
A moment gazed adown the dale,
A moment snuff'd the tainted gale,
A moment listened to the cry,
That thicken'd as the chase grew nigh;

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Then, as the headmost foes appear'd,
With one brave bound the copse he clear'd,
And stretching forward free and far,
Sought the wild heaths of Uam-Var."

This noble animal, once abundant on the wild hills and in the extensive forests of England, is now nearly extinct in this country. A few may be seen in the large parks of some of our nobility, and now and then one is met with in the range of the New Forest. In the mountain districts of Scotland they still abound; and the Forest of Athol, which consists of a hundred thousand acres, is devoted to red-deer. The chase of them has ever been a favourite sport, from the excitement attending it, and in former times was conducted with great magnificence. The hunters were stationed at a convenient spot for the use of their weapons, and vast herds were driven with hound and horn to the spot where their foes were concealed. As soon as they approached within shot, there was a general discharge upon them, and, starting from their ambush, the hunters showed themselves. It sometimes happened that

STAGS FIGHTING.

the herd finding themselves encircled, under the leadership of a noble stag, rushed desperately upon their foes in front, and, breaking through their ranks, to the great hazard of the hunters' lives, bounded clear away. Oftener, however, bewildered by the confused noise of the drivers behind, and the discharge from the huntsmen in front, they most of them fell a prey to their cunning foe. The present plan is widely different. The hunter sometimes sallies forth accompanied only by a couple of hounds; and, availing himself of every mode of concealment—hill, rock, or burn, tries to get within shot of the herd, and, picking out the noblest stag, seeks to bring him down with his fatal rifle. If he succeeds, all is done. If he only wounds the stag, the dogs are let slip, and soon succeed in bringing the flying quarry to bay; the hunter rushes forward, either to get another shot, that may kill the animal, or else at once to despatch him with the hunting-knife.

Jesse, in his "Anecdotes of Dogs," gives a most spirited account of the chase of a large stag in the Highlands by

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two very celebrated deer hounds, called "Buskar" and "Bran"—a part of which we shall copy, as being well calculated to give a good idea of the powers of the three animals.

"On reaching the top of the hillock, a full view of the noble animal presented itself, who, having heard our footsteps, had sprung on his legs, and was staring at his enemies, at the distance of about sixty yards. The dogs were slipped, and they set off at full speed straining after him. The deer's first attempt was to gain some rising ground to the left of the spot where we stood, and rather behind us; but being closely pursued by the dogs, he soon found that his only safety was in speed. The chase now became most interesting, the dogs pressed him hard, and the deer getting confused, found himself suddenly on the brink of a small precipice, about fourteen feet high. He paused for a moment, as if afraid to take the leap, but the dogs were so close that he had no alternative; however, he dropped himself so cunningly, that

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his hind legs first reached the ground, and off he ran, the dogs still following him closely. The dogs having got on smooth ground, gained upon the stag, who was still going at full speed, and at last they were close up with him. Bran was then leading, and in a few seconds was at his heels, and immediately seized his hock with such violence of grasp, as seemed in a great measure to paralyze the limb, for the deer's speed was immediately checked. Buskar was not far behind, for, soon afterwards passing Bran, he seized the deer by the neck. Notwithstanding the weight of the two dogs, which were hanging to him, he dragged them along at a most extraordinary pace (in defiance of their utmost exertions to detain him), and succeeded more than once in kicking Bran off. But he at length became exhausted—the dogs succeeded in pulling him down, and though he made several attempts to rise, he never completely regained his legs."

Under the earlier sovereigns of England, the forest laws were very severe: mutilation, branding and even death,

STAGS FIGHTING.

were inflicted upon any of the peasantry who should venture to kill a stag. One of the great crimes of the famous Robin Hood and his companions was, that they had no respect to the king's prerogative, and even in the royal chase of Sherwood, scrupled not to bring down a fat buck whenever they wanted a dinner.

Not only was the hunting of the red-deer a fruitful source of oppression to the poor, but it was also the occasion of endless broils amongst the great barons themselves. And those who left home equipped as a hunting party, often came back worsted from some bloody fray with the retainers of a neighbouring noble. The famous ballad of "Chevy Chase" gives an account of such a contest. The minstrel tells us at the commencement of his verses, that hunting was the object of the expedition which ended so disastrously.

"To drive the deer with hound and horn,
Earl Percy [took his way ;
The child may rue that is unborn
The hunting of that day,

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“The stout Earl of Northumberland
A vow to God did make,
His pleasure in the Scottish woods
Three summer days to take;

“The chiefest harts in Chevy Chase
To kill and bear away—
These tidings to Earl Douglas came,
In Scotland where he lay.”

The stag, though belonging to a timid class of animals, is often of savage disposition. A domesticated one, kept at a shooting lodge of Lord Breadalbane's, used to attack all who came near it, except the foresters, and was at last removed to the park at Taymouth. He became so fierce, and so expert with his antlers, that he killed two horses, and no one dared to pass his haunt unless he knew them. An anecdote illustrative of the immense power of the wild stag is related of the Emperor Basilius, who was attacked by a red deer of great size, which lifted him from his horse by merely entangling one of his horns in the riding belt. Although the sovereign was quickly released from his enemy by the assistance of his equerry, the bruises he received proved incurable.

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During the month of August and the beginning of September they will fight desperately with one another, and are even dangerous to persons venturing near their haunts. Instances are known of individuals who lost their lives by the attack of infuriated stags at this season of the year. When thus engaged in contest they lose their usual wariness, and, excited with mutual rage, blindly strive for the mastery. Their hoarse bellowing then sounds frightfully, while their blundering fury often ends fatally to themselves. Though not in season as food at that particular time, many of them fall a prey to the Highland poacher, and some of them are shot by the keepers. Our artist has chosen for his graphic sketch two noble harts butting one another with heedless anger, on the very verge of a precipice, down whose chasm they must inevitably go. The experienced deer-stalker will tell you that such instances are neither improbable nor uncommon, and that even hares have also been known to fight with equal desperation. Our picture is full of life and spirit, and we almost wait to see them topple down the precipice together.

STAGS FIGHTING.

The celebrated naturalist, Mr. Waterton, in his "Essays on Natural History," gives an account of a battle between two hares, which seems so much to resemble the fight between the stags, that we do not like to omit it :—

"Sunday, in the afternoon, as I was proceeding with my brother-in-law, Mr. Carr, to look at a wild-duck's nest in an adjacent wood, we saw two hares fighting with inconceivable fury on the open ground, about a hundred and fifty yards distant from us. They stood on their hinder legs like two bull-dogs resolutely bent on destruction. Having watched them for about a quarter of an hour, we then entered the wood—I observing to Mr. Carr that we should find them engaged on our return. We stayed in the wood some ten minutes, and on leaving it we saw the hares still in desperate battle. They had moved along the hill side, and the grass was strongly marked with their down for a space of twenty yards. At last one of the sylvan warriors fell on its side, and never got upon its legs again. Its antagonist then retreated for

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a yard or so, stood still for a minute as if in contemplation, and then rushed vengefully on the fallen foe. This retreat and advance was performed many times ; the conqueror striking its prostrate adversary with its fore feet, and clearing off great quantities of down with them. In the meantime, the vanquished hare rolled over and over again, but could not recover the use of its legs, although it made several attempts to do so. Its movements put you in mind of a drunken man trying to get up from the floor after a hard night in the alehouse. It now lay still on the ground effectually subdued, while the other continued its attacks upon it with the fury of a little demon. Seeing that the fight was over, we approached the scene of action—the conqueror hare retiring as we drew near. I took up the fallen combatant just as it was breathing its last. Both its sides had been completely bared of fur, and large patches of down had been torn from its back and belly. It was a well-conditioned buck-hare, weighing, I should suppose, from seven to eight pounds.”

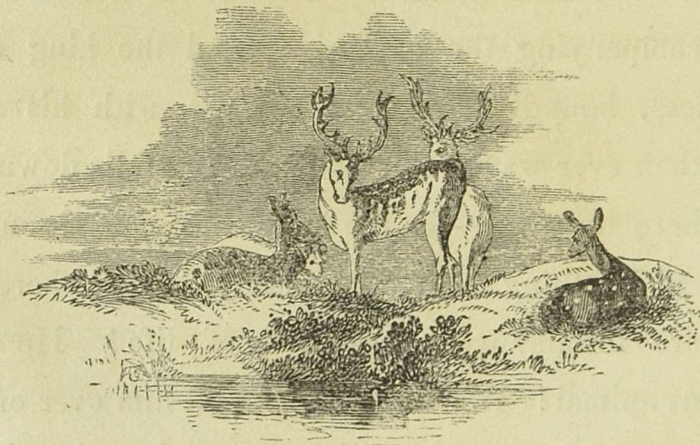
STAGS FIGHTING.

We cannot close this chapter without giving to our readers old Christopher North's portraiture of the death of the red deer; it is so thoroughly graphic; and perhaps it will not prove the less interesting on account of its antiquated phraseology:—

“Yonder, by the birches, stands a red deer, snuffing the east wind! He suspects an enemy in that air; but death comes upon him with stealthy foot from the west: and if Apollo and Diana be now propitious, his antlers shall be entangled in the heather, and his hoofs beat the heavens. Flourish the rifle—a tinkle as of iron—and a hiss accompanying the explosion—and the king of the wilderness, bounding up into the air, with his antlers higher than ever waved chieftain's plume, falls down stone dead where he stood—for the bullet has gone through his vitals, and lightning itself could hardly have withered him into more instantaneous cessation of life! He is an enormous animal! What antlers! Roll him over once on his side. See! up to our breast reaches the topmost

STAGS FIGHTING.

branch! He is a 'stag of ten.' His eye has lost the flash of freedom—the tongue that browsed the brushwood is bitten through by the clenched teeth—the fleetness of his feet has felt the fatal frost of death—the wild beast is hushed and tame! And there the monarch of the mountains—the king of the cliffs—the royal ranger of the woods and forests—yea, the very prince of the air—'shorn of all his beams,' lies motionless as a dead jackass by the way-side!—he who at dawn had borrowed the wings of the wind to carry him across the cataracts."





ASCENT OF THE WETTERHORN.

ASCENT OF THE WETTERHORN.

STRETCHING through part of France, Savoy, and Switzerland, is a chain of lofty mountains called the Alps, whose highest peak, Mont Blanc, rises fifteen thousand seven hundred and eighty feet above the level of the sea.

The name Alp is said to be derived from an old Celtic word, which signifies *white* ; and as many summits of this range are covered with perpetual snow, they were called by the inhabitants Alps. The peculiar sensation which is produced in the mind by travelling for the first time in a mountainous country cannot be well described ; it must be felt to be understood. At the first approach, you see in the distance the lofty peaks towering into the clouds ; and

ASCENT OF THE WETTERHORN.

only as you get nearer and nearer still, does the mind take in the stupendous masses which lie piled one on another in an endless variety of shape. The eye seems never weary of gazing on the scene; snow-fields, glaciers, cataracts, overhanging crags, and yawning chasms, in constantly changing order, lie before you; while, as you ascend slope after slope, lovely valleys and extensive prospects seem spread like a carpet beneath you. Nothing is more beautiful than an evening walk in the vale of Chamouni to witness the shadows of night darken around the mountain until the stars glimmer forth, almost seeming to rest on the pale peaks above.

The scenery is everywhere grand and sublime, and fills the soul with an overwhelming feeling of the power of the great Creator—God. The inhabitants of these districts are exposed to many dangers from mountain-slips, glaciers, and avalanches, by which, occasionally, many lives are lost, and even whole hamlets buried.

ASCENT OF THE WETTERHORN.

“Among those hilly regions where, embraced
In peaceful vales, the happy Grisons dwell;
Oft, rushing sudden from the loaded cliffs,
Mountains of snow their gathering terrors roll.
From steep to steep, loud-thundering down they come,
A wintry waste in dire commotion all;
And herds, and flocks, and travellers, and swains,
And sometimes whole brigades of marching troops,
Or hamlets sleeping in the dead of night,
Are deep beneath the smothering ruin whelm'd.”

Notwithstanding their dangers, and the many difficulties to be overcome in their ascent, some of the loftiest of the Alpine peaks have been scaled by adventurous travellers. Mont Blanc, the highest of the range, has many times been climbed, though some sad misfortunes have befallen part of its venturesome visitors.

Our picture represents the ascent of the Wetterhorn, which is one of the same range, and may serve to give some small notion of the difficulties to be met with in climbing the precipitous sides of a mountain.

When an attempt of this kind is to be made, the traveller's first care is to provide himself with trustworthy

ASCENT OF THE WETTERHORN.

guides, two or more being required to each person making the ascent. He has next to equip himself with a pair of boots fitted for the rough work before him, and bristling with huge nail-heads; warm clothing, a wide spreading straw hat, and a staff with a spike at one end. These being procured, he himself is ready; but the guides have to pack into knapsacks refreshments for the journey, which they strap to their backs, a coil or two of rope, and a hatchet, in addition to their staves, before all is prepared. The traveller feels little inconvenience at starting, but as slope after slope is passed, the rarefaction of the air produces a languor and heaviness that begets a desire for sleep. Sometimes the path lies along the side of a precipice which yawns in awful depth below; at others, scrambling over loose rocks, where every step requires great exertion, and occasionally a precipitous mass of rock and ice blocks up their way. The guides now fasten the rope with one end to themselves and the other to the traveller, and commence chopping steps in the rock with the axes

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they carry with them, clinging firmly to the mass with one hand, and rising step by step as they hew them out. The first guide mounts to the top of the rock, and by his help and counsel cheers the others to undertake the ascent, assisting the traveller constantly by the rope which connects them. Nevertheless, travellers say, that often in such situations a feeling of dizziness, and sometimes of recklessness, creeps over them.

“ A leap,

A stir, a motion, even a breath would bring
Their breasts upon the rocky bosom's bed
To rest for ever.”

In these perilous expeditions many such catastrophes have occurred. Lives have been lost by the falling of an avalanche, under which the whole party has been buried ; by parties dropping into the fissures of the ice, never to be seen again ; or by sliding down some field of frozen snow, and disappearing over the unseen edge of a precipice that bounded it, dashing to a thousand fragments as they fall. The hardy hunters of the chamois often fall beneath these

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misfortunes, yet there is a charm about the pursuit, which, notwithstanding its danger, binds them to it.

We have spoken of the feeling of exhaustion which on mountain elevations is felt. Saussure when on Mont Blanc experienced this feeling, accompanied by the loss of appetite, and ardent thirst, only to be momentarily appeased by water.

Lieutenant Wood speaks of being with a party of men on a mountain top, and he found that half a dozen strokes with an axe brought the workmen to the ground; and though a few minutes' respite restored breath, anything like continued exertion was impossible. The voice was sensibly affected; conversation could not be carried on in a loud tone without exhaustion; and the pulse throbbed at a fearful rate.

Baron Humboldt tells us that in his attempt to ascend Chimborazo, he managed to climb near to its summit; and though very anxious to reach it and make philosophical observations there, he was obliged to desist, for he found

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that drops of blood were issuing from under his nails and his eyelids.

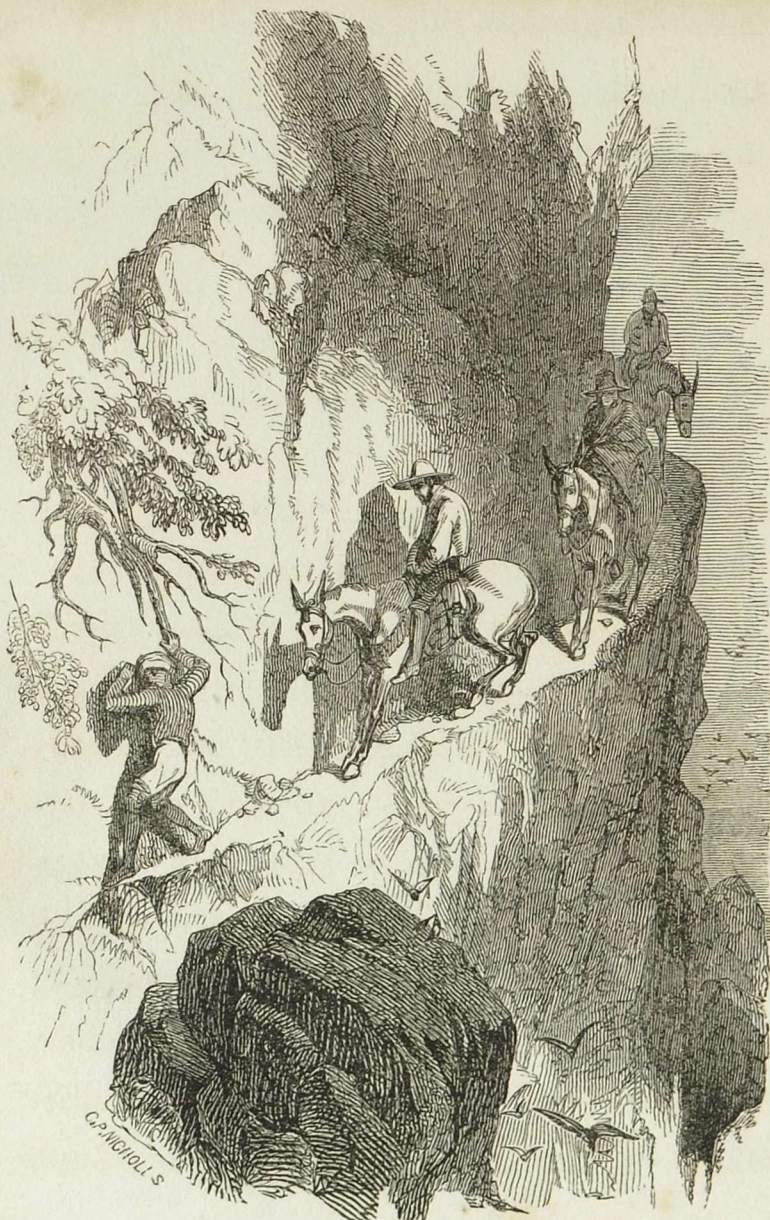
In our opinion, there are few occasions which justify men running such risks. The observations of scientific persons are valuable ; and we ought to be thankful to them for the courage that leads them to endure hardships in order to obtain them. But the fool-hardy attempts of mere pleasure-hunters hazarding their own lives, and risking the lives of others, we must condemn.

Gazing on these mighty masses, it seems as if no power could shake or destroy them. They rise above the region of storm and tempest, and the convulsions of nature leave them unmoved. Looking from their lofty height, they seem to mock the mutability of man, and to rejoice in the proud title, "the everlasting mountains." Yet we know full well there was a time when they were not, and the voice that called all nature into being gave birth to them.

Their wondrous vastness and unalterable stability should fill our minds with sentiments of profound homage to their

ASCENT OF THE WETTERHORN.

mighty Maker. "Before the mountains were brought forth, or ever thou hadst formed the earth and the world, even from everlasting to everlasting, thou art God."



CROSSING THE ANDES.

CROSSING THE ANDES.

TILL of late years the Andes were supposed to be the highest mountains in the world. Modern travellers, however, assert that the Himalaya mountains in Asia are still more lofty. Notwithstanding the peril which attends a passage across the Andes, it is by no means unfrequently accomplished. There are, of course, no roads ; and the usual path pointed out by the guides is scarcely discernible, nor is it more safe than any other which may be at all practicable. The snow rarely melts on the summit of these mountains ; indeed, it is winter all the year round. Travellers among these mountains have many difficulties to encounter, not only from the steepness and ruggedness

CROSSING THE ANDES.

of the path, but from the deep rapid torrents which rush down from the heights above with such impetuous force, as to clear away all obstacles. Rope bridges are therefore used here to enable passengers and their mules to pass over these cataracts, as they are in India. The adventures of two noble Spaniards in a journey from Guyaquil to Quito, will give some idea of the nature and danger of the enterprise, and will be interesting to our readers.

These gentlemen undertook the journey by order of the king of Spain, who directed the governors of his American provinces to afford them every needful assistance. They were attended by a number of Indians, who acted as guides. After leaving the first town they arrived at, they found they had engaged in a very dangerous enterprise, for the steepness and ruggedness of the path were greater than our readers can imagine. In many places the mules had scarcely room to set their feet. In other parts the path was full of deep holes, so that when the mules set their

CROSSING THE ANDES. .

feet into them, the riders' feet were drawn along the ground. However inconvenient these holes might be to the riders, they had the advantage of enabling the mules to keep a better footing than they could have done otherwise. With such firm resting-places for their feet, they could not slip back, as they might have done, owing to the extreme steepness of the mountains. However, if the animal does not place his feet properly, the rider must fall ; and if he falls on the side of the precipice, he perishes. Where these holes are wanting, the danger is much enhanced on account of the frequent rain making the chalk path so frightfully slippery, that even the most courageous passenger trembles. By continued perseverance, however, the travellers at length reach the top of a mountain, and find that the descent on the other side is an undertaking equally formidable. Imagine, for a moment, that you behold them on the brink of one of those steep declivities so common amongst the Andes. Their mules suddenly stop, and even if their riders are bold enough to attempt

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to spur them on, they remain immoveable. Indeed, the poor animals have cause to dread the steepness of the descent. Now it is that they seem to be actuated by reason, for they not only attentively view the road before them, but they tremble and snort at the danger. On one side of the narrow path rise steep and rugged eminences : here and there the roots of trees are seen above the soil ; the heavy rains having washed away the earth which covered them. On the other side of the path is a frightful precipice, down which the mule and his rider must both be thrown if the least accident should interrupt the steadiness of their motion. The rider must keep himself fast in the saddle, without attempting even to guide or check the beast ; for the least motion is sufficient to destroy the equilibrium of the mule, and, in that case, they must both inevitably perish. Well, the poor animals hesitate to proceed—the Indian guides go forward and place themselves along the side of the mountain, holding fast by the roots of the trees, to keep from slipping ; in this situation

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they encourage the animals by their shouts. Resolved at length to make the attempt, the mules place their fore-feet close to each other; they also put their hind feet together, but a little forwards, as if they were going to lie down. In this attitude, after having taken, as it were, a survey of the road, they slide down with astonishing swiftness. Their skill is truly wonderful; for, in this rapid motion, when they seem to have lost all government of themselves, they follow exactly the different windings of the road, as if they had beforehand settled in their minds the route they had to pursue. Without the aid of these sure-footed and sagacious mules, there would be no possibility of passing over these mountains, where the safety of travellers depends entirely upon the skill and experience of these animals.

A GLANCE AT CHINA.

THE Macedonian king, when he had reached the banks of the Indus, wept like a spoiled child at the belief that he should soon have no more worlds to conquer. He knew not that far beyond the Ganges, whose sacred stream he never visited, was a vast region, more populous, more civilized, and more wealthy than any of those which his armies, in their rapid march from the Hellespont, eastward, to the swift Hydaspes, had overrun. Two hundred years before the era of Alexander the Great, flourished Coon-foo-tse, or, as he is known to Europeans, Confucius, the sage and lawgiver of China, and the contemporary of Herodotus, the father of Grecian history. And for cen-

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turies before the time of Confucius had the Chinese empire existed; counting far back her rulers and her dynasties, till the truth of history was lost in a mist of mythological exaggeration, which absurdly claims for the "Celestial Empire"—as the Chinese fondly term their country—a date some centuries previous to the time fixed by Moses for the creation of man. This, however, the more enlightened among themselves are content to consider fabulous.

The simple truth is sufficiently wonderful without resorting to fable; for strange indeed it is that a mighty empire should have flourished, whose very name was for centuries a mystery to the nations of the West, and whose existence was sometimes treated as a chimera.

For more than twenty centuries China appears to have attained nearly the same degree of civilization and advancement in arts, sciences, and government, which now so favourably distinguish it from other Asiatic nations; and there it appears to have been nearly stationary. While the "outside barbarians" of the West have been

struggling, century after century, out of the darkness and ignorance and brutality of their forefathers, the Chinese, content with the wisdom, the discoveries, and the precepts that so justly distinguished the remote antiquity of their empire, have hitherto shared but little in the mighty changes, whether for good or evil, which have passed over the face of the earth.

The doctrines of Christianity made but little progress amid the millions of the Celestial Empire; the Jesuits being for a long period the only possessors of the Christian religion that obtained an entrance, and they were admitted, not as teachers of another faith, but as astronomers, astrologers, and mathematicians. Mahomet appeared upon the scene, and shook the thrones of half the known world. The faith he preached spread from Arabia, and overflowed all lands, from the Straits of Gibraltar in the West, to Central Asia in the East; triumphing alike over the dead and corrupted forms of superstition, that in the sixth century usurped the name of Christianity—over

the tenets of Zoroaster, which still lingered amid the fire-worshippers of Persia—over Bramah and the subject idols of Hindostan. But while thrones and religions thus fell before the sword of Islam, the doctrines of Confucius retained their sway undisturbed throughout the extent of China.

The Tartars of Central Asia, they whose kindred at different periods and under different names have ravaged the most fertile and populous regions of Europe and Asia, have twice invaded China, and seated a Tartar dynasty upon the throne of Pekin; and the present Emperor of China is the sixth descendant of the Manchou Tartar chief who conquered China in 1643. But though a Tartar race may rule, China and the Chinese remain essentially unchanged; the religion, the manners, the very name even of the conquerors, are absorbed and all but lost in those of the conquered: the Tartar becomes Chinese; and while the unwarlike nature and peaceable and industrious habits of this remarkable people appear to

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render them an easy prey to the brute force of a handful of invaders, their immense numbers, the general diffusion of education among them, the profound reverence and attachment to the laws, language, and customs of their ancestors—fostered from earliest infancy—these and other causes ensure their essential independence as a nation, and enable them to retain, by a species of passive resistance and conservative inertia, all their national characteristics unchanged through the lapse of ages.

Lord Brougham, in his striking way, has summed up the most remarkable features in the character and history of the Chinese. “A territory of enormous extent, stretching 1,400 miles from east to west, and as many from north to south—peopled by above three hundred millions of persons, all living under one sovereign—preserving their customs for a period far beyond the beginning of authentic history elsewhere—civilized when Europe was sunk in barbarism—possessed, many centuries before ourselves, of the arts which we deem the principal triumphs of civiliza-

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tion, and even yet not equalled by the industry and enterprise of the West in the prodigious extent of their public works—with a huge wall 1,500 miles in length, built 2,000 years ago, and a canal of 700, four centuries before any canal had ever been known in Europe,—the sight of such a country and such a nation is mightily calculated to fix the attention of the most careless observer, and to warm the fancy of the most indifferent. But there are yet more things unfolded in the same quarter to the eye of the political philosopher.

“All this vast empire under a single head; its countless myriads of people yielding an obedience so regular and so mechanical, that the government is exercised as if the control were over animals or masses of inert matter; the military force at the ruler’s disposal so insignificant, that the mere physical pressure of the crowd must instantly destroy it were the least resistance attempted:—the people all this while, not only not plunged in rude ignorance, but more generally possessed of knowledge, to a certain ex-

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tent, and more highly prizing it, than any other nation in the world:—the institutions of the country established for much above five-and-twenty centuries, and never changing or varying (in principle at least) during that vast period of time:—the inhabitants, with all their refinement and the early progress in knowledge and in the arts, never passing a certain low point, so that they exhibit the only instance in the history of our species, of improvement being permanently arrested in its progress:—the resources of this civilized state incalculable, yet not able to prevent two complete conquests by a horde of barbarians, and to chastise the piracies of a neighbouring island (Japan), or to subdue a petty tribe (Meaoutse), existing, troublesome and independent, in the centre of a monarchy, which seems as if it could crush them by a single movement of its body:—the police of the state, all-powerful in certain directions, and in others so weak as to habitually give way for fear of being defeated:—the policy of the state an unexampled mixture of wisdom and folly, profound views

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and superficial errors :—patronage of arts and sciences, combined with prohibition of foreign improvements :—encouragement of domestic industry, with exclusion of internal commerce :—promotion of inland manufacture and trade, without employing the precious metals as a medium of exchange :—suffering perpetually from the population encroaching upon the means of subsistence, and yet systematically stimulating the increase of its numbers ; removing every check which might mitigate the evil, and closing every outlet for the redundancy.”

There seems good reason to believe, that the great jealousy of intercourse with foreigners, which the rulers of China have for so many years exhibited in so remarkable a manner, arose mainly from the fears of the Tartar rulers, lest their people, by acquaintance with other nations, should acquire inclination or power to throw off their foreign yoke ; and that the vexatious and insulting obstructions to commerce, so long persisted in, were scarcely more obnoxious to us than to the wishes and

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habits of the Chinese people, although their love of order and reverence for the authority of their rulers checked any exhibition of this feeling on their part.

If this be the case, we may indulge a not unreasonable hope that the war, so recently waged by England against China, contemptible, not to say disgraceful, as it was in its origin, may, in its consequences, be beneficial to the Chinese, as well as to other nations.

Sir Henry Pottinger (who negotiated on the part of England the treaty of Nanking, which was concluded in 1843), with wise and liberal policy, stipulated for no exclusive privilege to England, but included other nations in its provisions for free commercial intercourse. Sir Henry speaks most highly of the ability and uprightness of some of the Chinese Mandarins, who conferred with him upon the provisions of the treaty; and the esteem appears to have been mutual, and to have ripened into friendship.

The Chinese, astonished that an island of inconsiderable size could exhibit, at such an immense distance from

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home, power and resources sufficient to baffle all the efforts of their own great empire, in the very centre of its dominions, have lost much of that overweening self-conceit which made them affect to treat all visitors as tributaries and subjects, and therefore as objects of contempt and insult. The English, as their acquaintance with the language and customs of this singular people increases, appear to find more and more to respect and to admire, and less to ridicule ; and let us hope that, by the mutual exercise of forbearance and confidence, the newly cemented friendship between England and China may continue undisturbed by oppression on one part, and by ill faith on the other.

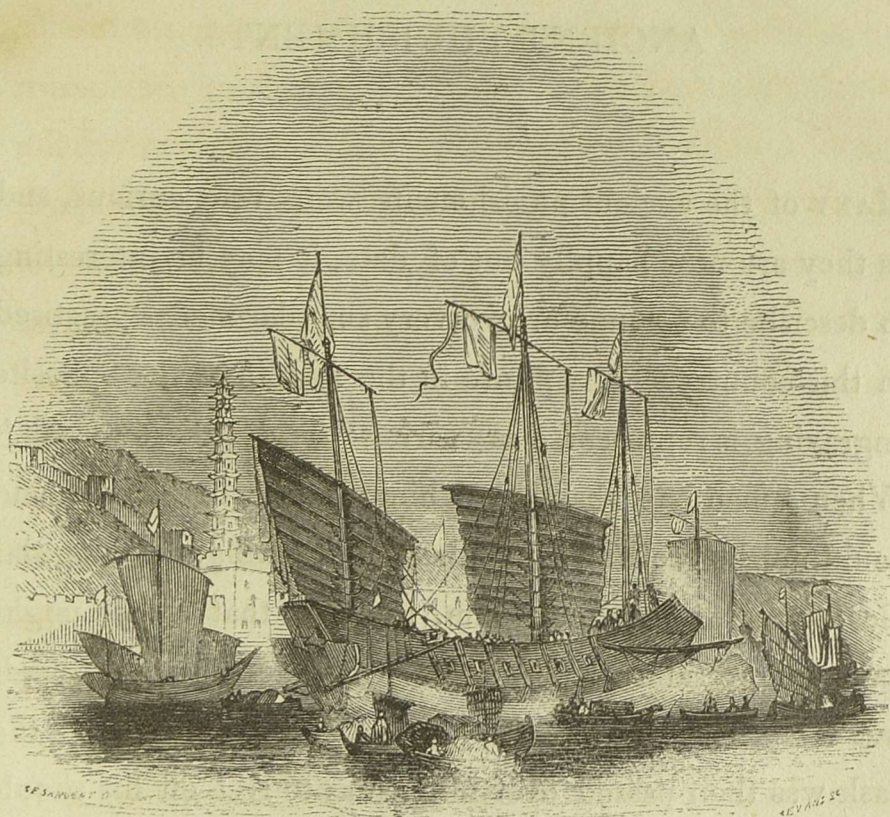
We have thus endeavoured to afford a few general glimpses of the wonderful things concerning this great portion of the human family ; for seeing that so many works, of easy access for all readers, have recently appeared, containing descriptions of China in every aspect, it seemed needless

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to repeat the process here. Every reader, young and old, is by this time familiar with the quaint, unwieldy forms of Chinese junks, with their high, overhanging sterns, their bamboo sails, and ornaments of paint and gilding ;—the nine-storied pagodas, with their porcelain roofs, peaked, and ornamented with bells and flags, are known to us all from the days of childhood, when we admired the blue pictures on our plates, beneath the meat and pudding ; and there too, and in many a pictured page of greater pretensions, we have become familiar with Chinese bridges, fish-ponds, and pleasure-houses, and the never-absent willow—the doll-like lady, with her pinched and stunted feet, and the fat Mandarin, with his long tail. The Chinese Exhibition, too, has shown to thousands of delighted visitors the manners and productions of the empire in yet more vivid reality. And as to the Great Northern Wall, one of the “wonders of the world,” be they limited to seven, or extended to a hundred, it is

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familiar to every young student of geography; and so we need not enlarge upon it here, but will take our flight to other scenes in search of other wonders.



ANCIENT PUNISHMENTS.

MANY of the ancient punishments were very curious, and as they are now happily out of date, it may be interesting to describe to you one or two very singular modes practised in this country. The figure in the middle of the opposite engraving, is represented as wearing "the drunkard's cloak." When a man had abandoned himself to drunkenness, and could not be reclaimed by advice or warning, this singular cloak was prepared for him, in hope that shame might have a more salutary influence. One end of a large cask was taken out, and a round hole cut in the other end ; the cask was then passed over him, so as to rest on his shoulders, while his head came out at the hole : two holes were

ANCIENT PUNISHMENTS.

also made in front, through which his hands were passed. Thus the drunkard was led through the streets, amidst shouts of laughter, the object of the ridicule and contempt of his fellow townsmen.

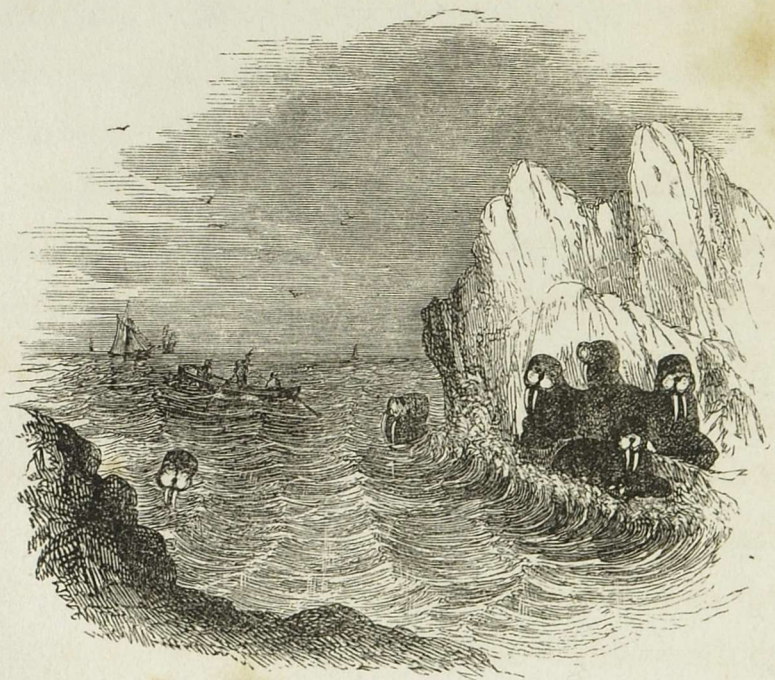
The strange head-dress worn by the woman in the same picture, was called the branks, or sometimes "the gossip's bridle:" it was in use at Newcastle-under-Lyne about two hundred years ago, and though it has long been laid aside, it is still shown as a curiosity to visitors at the court-house of that town. Its object was to expose those women who were fond of gossiping from house to house, while their own homes and family duties were neglected. As in the other case, an officer led the talkative lady through the town, exposed to the public gaze, as a wholesome example to others who were disposed to indulge their tongues too freely.

Another punishment was "ducking a scold." A female of this description was seized by her neighbours and conveyed to the side of a river, or to a public wharf; then

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being tied fast in a chair, she was let down into the water, and ducked several times, till they considered her sufficiently punished.

The little building in the distance of the scene figured, is the cage; a common mode of confinement with our forefathers. One used to stand on old London Bridge, into which trifling offenders were put for exposure. There were several other modes in use formerly, but they are now nearly forgotten.



THE WALRUS.

THE WALRUS.

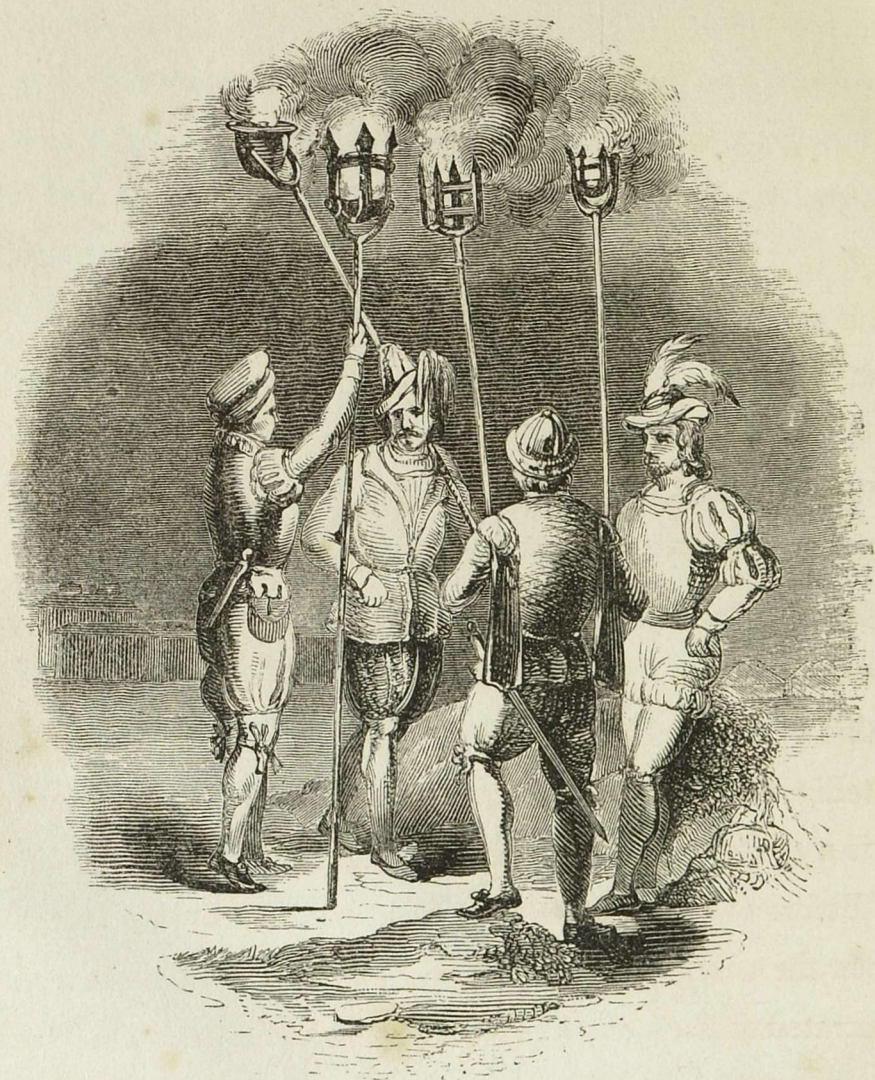
THE walrus, though it is a large and powerful animal, its general disposition and habits are peaceful and inoffensive. Its length sometimes exceeds eighteen feet, and its girth is frequently not less than ten or twelve feet. Its only weapons of defence are two large tusks, which bend downward, projecting from its upper jaw, which also serve for the scraping of shell-fish and other prey out of the sand. Though the general residence of this animal is in the sea, yet it is perfectly amphibious, and lives with equal ease either on land or in water. If its passions be roused by an attack, it is said to be vindictive and fierce. When surprised on the ice, the females provide for the safety of

THE WALRUS.

companions in front, attempt, by means of their tusks, to force their way through the crowd; and several that have been taken at such times by means of boats have borne visible proofs of the hurry of their comrades, in the numerous wounds inflicted on their hind quarters.

The walrus, however, when attacked in the water, is by no means an easy animal to kill, offering sometimes a successful resistance. Instances have been known of their staving and sinking boats engaged in their capture.

Landt mentions, in his description of the Feroe islands, that two walruses were caught on those coasts. They were hanging fast to a rock by their long tusks. During the early part of the summer this animal is to be found among the ice, but later in the season it resorts to open water, where immense numbers collect, and pass the live-long day away upon the rocks and sloping beaches.



ANCIENT MODE OF LIGHTING LONDON.

LONDON, PAST AND PRESENT.

How can we give an idea of London to one who has never visited it, when some even of those who have spent their lives in wandering amid its wilderness of houses, have never seen one half of its extent, and have still less knowledge of its wealth, its commerce, and its population? An intelligent Frenchman said very truly, "It is not a town; it is a *province covered with houses*."

Before the era of railways, it used to grow by degrees upon the country visitor as he approached its more concentrated masses of streets and houses, and his notions of the great city had time to accommodate themselves gra-

dually to the real state of things. As he rolled along the turnpike-road outside some well-appointed "four-horse coach," he saw before him for half a day before he had reached his destination, a long, low, dingy cloud in the distant horizon, which the coachman's whip would point out as "London smoke." There it hung ; visible, while yet he was among the breezy commons of heath and furze, or under waving boughs that shadowed the dusty road. As he rolled along,—instead of detached villages or well-defined towns, separated by long intervals of field, and common, and copse, enlivened here and there with the detached farm-houses, barns, and road-side inns, the country gentleman's mansion, and the gipsy's tent—the road became *all village*, one joining on to another in quick succession, sadly taxing the memory of the bewildered traveller, who had hitherto asked most perseveringly the name of each town he had passed through. He seemed, for the first time, to be in two places at once—in one locality before he was out of another.

LONDON, PAST AND PRESENT.

On he rolled, and the continuous village became a town; the road gradually concentrated into a street, and his "long coach," with its fleet four-in-hand, (the proprietor's "crack team," to drive through London with,) threaded its mazy way amidst shoals of strange and various vehicles, and looked superior to them all. There were the lumbering omnibus, the busy, scrambling cab, the elegant carriage, with splendid hammer-cloth, and bewigged and liveried coachmen and flunkies—gigs, phaetons, and market-carts, drays, vans, and waggons of all shapes and dimensions, and still the confusion grew more dizzy and confounding, till a jarring crash upon the paved street aroused the bewildered traveller, and told him that he had at length reached the stony heart of London. But, alas! with few and rare exceptions, "we have changed all that" for the railway and the steam-engine. Onwards, onwards still we press, faster and faster yet. But now, and the varied sights of rural life were flitting by us in quick succession, each no sooner glanced at than

LONDON, PAST AND PRESENT.

it is gone ; a moment more, and in its place, as by some magic process, there is the glare of shops, the rattle of wheels, the busy hum of myriads of human beings—the ceaseless roar of the mightiest city of the earth !

Hill and dale, hedge-row and heath, the cottage with roses, the meadow and its quiet herd, “ forty feeding like one,” the shepherd and his flock, the mansion in stately solitude, with all its tall and ancestral trees, all these, and more, were before the traveller a moment since, and seem before him still, mingling in strange confusion with the Great Babel into which he is so suddenly plunged, while, confused by the abrupt contrast of sights and sounds which greet him, he gazes with blank amaze on all around, scarce knowing what he sees or what he hears.

London was an important city—the capital of England—a thousand years ago ; and it has been growing, and spreading, and condensing, almost without a check, from that day to this. Growing for a thousand years, and growing still, faster than ever ! Still creeping along the

LONDON, PAST AND PRESENT.

banks of that noble river, to the depth and security of whose waters the city owes its rise, its increase, and its prosperity.

The marsh through which Cæsar and his legions waded has long given place to the busy wharf, with its piles of merchandize from every clime, its huge masses of warehouses, dark and lofty, beneath whose shadow crowd the barge and the steam-boat. The streams to which Saxon maidens were wont to resort "to gather simples," now grope their subterranean way beneath halls devoted to trade and commerce, and the administration of justice ; the resort of the merchant-princes of England ; and the sanctuary for the vast treasures of the Bank of England, and its numerous satellites of Lombard-street ; and the palace of the chief magistrate of England's and the world's chief city. The forest, where once ranged the wild boar, the wolf, and the antlered stag, has given place to the picture-gallery and the triumphal column ; to the square, the terrace, and the crescent, with their luxurious mansions,

LONDON, PAST AND PRESENT.

tenanted by nobles and senators ; to long vistas of streets in endless succession, dazzling with wealth and splendour unknown to Rome or Babylon or old.

Nearly a thousand years ago (in A.D. 885) London, which had been sacked and burned by the Danes, was being rebuilt by King Alfred, whose galleys rode, unchecked by a single bridge, along the Thames, when now his waters reflect many an arch of granite or iron, above whose crown ebbs and flows a tide as ceaseless as that which glides beneath its shadow.

For nearly two hundred years after the time of Alfred, Saxon and Dane struggled for the realm of England, with various success. But amidst the fierce conflicts London still grew on, and when King Harold (in 1066) passed through the city on his hurried march to the fatal field of Hastings, he despatched from London seven hundred vessels to intercept the Norman invaders in the flight so fondly and so vainly anticipated by the too confiding Saxons. And when Duke William, after his great vic-

LONDON, PAST AND PRESENT.

tory, appeared before the city, the warlike population, numerous even then, defended the walls; and the conqueror, compelled to abandon his idea of obtaining instant possession of the capital, ravaged the surrounding country, intercepted the communication with the Saxons of the north, and cut off the supplies, until the citizens, threatened with the horrors of famine, and discouraged by the supineness and incapacity of the Saxon earls and thanes, made terms with William, at Berkhamstead.

Passing by another *two hundred* years—through the horrible oppressions of the early Norman kings, the devastating wars of Stephen and Matilda, and the Crusades—we come to the era of Magna Charta; and find a parliament at Westminster struggling with the weak and unpopular Henry III., the king promising redress of grievances in hopes of obtaining supplies, and the parliament withholding, until they have some better security than the word of a king which had been so often violated. Once, in his need, he was counselled to sell all his plate and

jewels. "Who will buy them?" said he. "The citizens of London, of course," was the reply. "By my troth," said Henry, bitterly, "if the treasures of Augustus were put up to sale, the citizens would be the purchasers! These clowns, who assume the style of barons, abound in all things, while we are wanting common necessities." From this time the king was more than ever inimical to the city; and to injure its commerce, (then amid wars, and plunder, and oppression—as now in peace and security—the source of all its wealth,) Henry established a fair at Westminster, which was to last fifteen days, during which all trading was prohibited in London. What is now Charing Cross was then a village in the fields, midway between the rival cities, which have long since mingled into one.

In 1218 the forest of Middlesex was cleared, and the citizens of London were allowed to build there. The Tower and old London Bridge in the east, and Westminster Abbey in the west, were the principal buildings of this era which have existed till our day

LONDON, PAST AND PRESENT.

Through the next *two hundred* years the wealth and trade of London continued steadily to increase. The citizens obtained from the mighty Plantagenets privileges and rights, in exchange for the loans by which only those war-like sovereigns were enabled to carry on their conquests in France ; and amidst the brilliant but useless glories of Crécy, and Poitiers, and Agincourt, London carried on a profitable and increasing trade with Flanders,—with the extensive and fertile provinces in southern and western France, which owned allegiance to the English crown,—with Spain and the Mediterranean southward,—and as far northward as the Baltic. The civil wars of the Roses, like the foreign ones with France, gave but little interruption to the progress of London, which generally supported the House of York ; the princes of which family relied less on the power of the barons than on that of the commons, whose favour they courted, and whose privileges they increased and confirmed on many occasions.

Lanterns were first hung out of citizens' houses in the

principal streets in 1416 ; before, and even after that time, watchmen with fire-baskets, such as are represented in the cut, kept watch through the night before the houses of the nobility and at other important stations.

Year after year rolled on ; wooden houses were replaced by those of brick ; old streets were paved and widened, and new streets stretched into the fields in every direction : wharfs and warehouses were built by the river side ; churches and palaces arose in every quarter ; the population rapidly increased ; and two or three hundred years ago, when London was not half its present size, successive sovereigns issued proclamations and edicts, forbidding any further increase to a city, which was even then thought to have extended beyond all bounds of reason and safety.

In the sixteenth and seventeenth centuries the improvements and increase continued. The Royal Exchange was built ; the New River supplied individual houses in the metropolis with water ; sewers were dug ; and hackney-coaches plied the streets for hire. The great plague,

speedily followed by the great fire of London in 1666, checked the progress of the city, but only to enable it to advance more rapidly and more safely. The latter event, which destroyed all the most densely-built portions of the metropolis, enabled Sir Christopher Wren, although he was not allowed to carry out his plan of improvement to the desired extent, to change its appearance and character—by wider streets, better built houses, and more complete draining. In consequence of these improvements, the health of the inhabitants was greatly promoted. The plague, which until then had constantly lurked about the back streets and narrow lanes by the water's side, and which on particular occasions burst out with depopulating violence, was no longer a recognised visitor; and the virulence of other diseases was much abated.

Nevertheless, great as was this advance, the contrast between the London of *a hundred* years ago and the London of the present day is as great. The fathers of many now living, could remember seeing the heads of the Scotch

lords, who had risen in arms for the Stuarts, rotting on Temple-bar, telling a disgraceful tale of barbarous and pitiful revenge, unworthy of a Christian government and people. The dim oil lamps, which just rendered visible the darkness of night, winked at many a deed of violence and outrage, which the broad glare of the gas-lights (first used in Pall Mall, in 1816) has scared away. Within the last *fifty* years have been formed the docks and their surrounding warehouses, which now line the river for six miles below London Bridge, and afford accommodation for vessels of the largest size; the huge Indiaman from either hemisphere, with sugar, cotton, tea, silk, spices, &c.; the splendidly-fitted American packets; the wool ships of Australia; the whalers from Greenland and the Antarctic; timber ships from Canada and the Baltic; and mixed fleets of smaller vessels from every coast.

Fifty years ago, and the power of steam to propel vessels in spite of wind and tide, was treated as a chimera too absurd for experiment; and now hundreds of steamers,

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of every size, with their black chimneys and long streams of smoke, wend their swift way along old Father Thames, churning his waters, and raising on his bosom a mimic sea, whose heaving wave bids the light wherry dance as it skims along, meets the cumbrous barge with alternate heave and plunge, and dashes in foam against the tiers of merchant men fast anchored in the stream. Still more recently the railroad, with all its wonders, stretches from the city in every direction, and encloses a wider and yet wider circuit of provinces in its embrace, until it bids the remotest corner of the isle give quick response to every pulsation of the "mighty heart" of London.

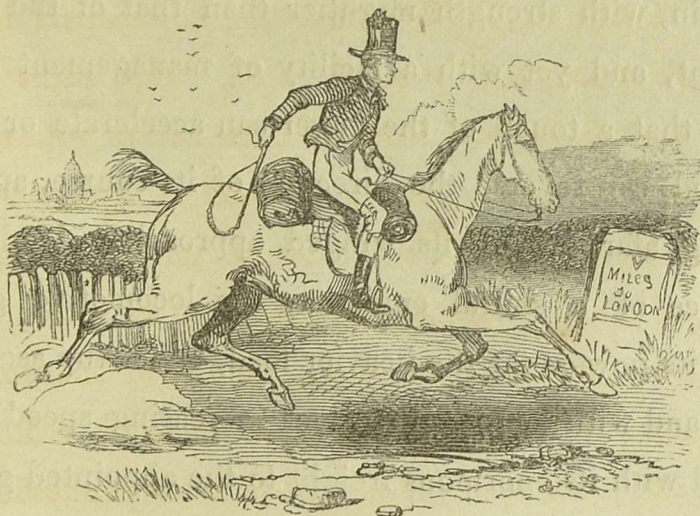
The population of the metropolis, (including by that term the cities of London and Westminster, the five parliamentary boroughs, and the parish of Chelsea,) is now nearly two millions, equal to the *united population of the four largest cities* on the continent of Europe; namely, Paris, Petersburg, Naples, and Vienna; and of these five Paris has nearly double the number of inhabitants of the

largest of the remainder, containing 910,000, while Petersburg has 470,000, Vienna and Naples each about 350,000 inhabitants.

The immense population of the capital of the British empire consumes every year at least 1,200,000 quarters of wheat, about one-and-a-half million of sheep, nearly 200,000 bullocks, 25,000 calves, 25,000 pigs; besides poultry, game, fish, vegetables, and fruit in incalculable quantities. About 12,000 cows supply the citizens daily with milk; 72 millions of gallons of porter and ale are annually drunk in London; half the newspapers in the United Kingdom are printed there. The eight great water companies supply about 200,000 houses with nearly 250 millions of gallons of water yearly. About 90,000 gas lights are nightly lit, and consume on the average 10 millions of cubic feet of gas every twenty-four hours. But we might fill a volume with mere glimpses of this wonderful city—such volumes exist—and yet before a visitor can form an adequate idea of its size and its population, its

LONDON, PAST AND PRESENT.

abounding wealth and its squalid poverty, its contrasts of magnificence and wretchedness, he must have persevered day after day in exploring its various quarters, mixed with all classes of society, inspected its hospitals and its mansions, its picture-galleries and its temples, its docks and its bridges, its dark corners of crime and misery, its splendid exhibitions of wealth and taste ; and if he have a heart to feel and a head to think, he will go to his rural home with food for meditation for many days, a wiser, and if he improve his opportunities, a better man.



THE RAILWAY AND THE STEAM-ENGINE.

Is it not, indeed, wonderful that a machine, formed by human skill of the rough metals dug from the earth, and fed with fire and water, should be endowed with swiftness far beyond that of the fleetest courser that ever scoured the plain, with strength mightier than that of the largest elephant, and yet with a facility of management so exquisite that a touch of the finger can accelerate or retard its speed, can reverse the direction of its course, and give warning afar off of its winged approach? Under the guidance of a skilful engineer, the locomotive gathers up all its powers for the heavier load, or for the ascending plane, and with increased and yet increasing speed rushes onward with its enormous freight to the appointed goal.



RAILWAY CUTTING.

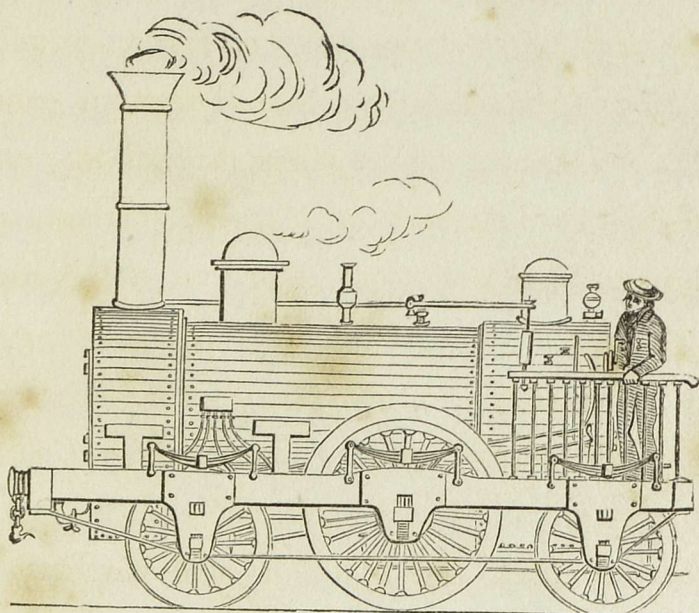
THE RAILWAY AND THE STEAM-ENGINE.

Most, if not all, of my readers have, no doubt, visited a railway-station, and none who have witnessed it can fail to be surprised at the busy scene presented when a train is about to start. Here are the clerks taking money and dispersing tickets to first or second-class passengers going to various stations on the line ; numerous porters wheel along the heaps of passengers' luggage ; the superintendent is busy everywhere giving his directions ; the guard is handing the passengers to their seats, and as the moment of starting approaches examines his time-piece, hung at his side in a leathern wallet ; the engineer and his assistants, grim with coke-dust, are feeding with fuel and water their mighty steed, from whose huge form issue strange noises—the bubble bubble of the heating water, the deafening hiss and scream of the hot vapour that struggles to burst its prison, and scatter death and destruction around, if not allowed an occasional outburst ; while ever and anon a gigantic snort, and a few quick, impatient strokes of the piston, give startling warning.

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The first bell rings ; the breathless loiterer who rushes into the station at the very last moment, and sorely tries the patience of the attendants with most unseasonable heaps of luggage, is pushed into a seat, feverish to the last with anxiety for the safety of his goods and chattels ; the door is slammed after him, the guard mounts to his seat, the engineer makes some magical movement of his hand, and the long train, with engine, carriages, passengers, and luggage, glides smoothly on, out of the station-house, past confused crowds of more trucks, carriages, and engines ; past long and lofty piles of warehouses and engine-rooms, which appear, and glimmer, and vanish, before the dazzled eyes of the travellers ; and the mighty mass, gathering speed as it goes, is soon bounding along over the open country.

A pleasant contrast is afforded by a quotation from a recent article upon Locomotion, in which the quiet jog-trot pace of the stage-coach travelling of eight miles per hour is described :—



LOCOMOTIVE ENGINE.

THE RAILWAY AND THE STEAM-ENGINE.

“At the time when that rate of progress was considered, all that was required, there was a coach between Shrewsbury and Chester, called the Shrewsbury and Chester Highflyer. This coach started from Shrewsbury at eight o’clock in the morning, and arrived at Chester at about the same time in the evening, the distance being forty miles. This was a good hard road for wheels, and rather a favourable one for draught ; but how could all these hours be accounted for ? Why, if a commercial gentleman had any business at Ellesmere, there was plenty of time for that ; if a real gentleman wanted to pay a morning visit on the road, there could be no objection to that. In the pork-pie season, half an hour was generally consumed in consuming one of them, for Mr. Williams, the coachman, was a wonderful favourite with the farmers’ wives and daughters all along the road.

“The coach dined at Wrexham, for coaches lived well in those days—they now live upon air—and Wrexham Church was to be seen, a fine specimen of the florid

THE RAILWAY AND THE STEAM ENGINE.

Gothic, and one of the wonders of Wales. Then Wrexham was also famous for its ale—there were no public breweries in those days in Wales, and, above all, the inn belonged to Sir Watkin. About two hours were allowed for dinner ; but Williams, one of the best tempered fellows on earth, as honest as Aristides, was never particular to half an hour or so. The coach is ready, gentlemen, he would say, but don't let me disturb you if you wish for another bottle. Competition, however, of the most eager kind has been for some years the order of the day, and most certainly it cannot be said that stage-coaches stood still.

“ Leaving out of the question the light coaches, which travelled at an extremely rapid rate, we may notice the speed maintained by the mails which had to travel long distances, before their employment was superseded by railways.

“ The Edinburgh mail ran four hundred miles in forty hours, stoppages included. This was nearly eleven miles an hour. A coach to Exeter, the Herald, went over its

THE RAILWAY AND THE STEAM-ENGINE.

ground, one hundred and seventy-three miles, in twenty hours, and that in a very uneven country ; and the Devonport mail performed its journey, two hundred and twenty-seven miles, in twenty-two hours.

“ This increase of speed was alarming to those who had been accustomed to the old-fashioned slow coaches ; and the rates at which the new vehicles travelled was considered as a reckless risking of human life.”

However, let us examine a little into the means by which the ordinary railway speed is accomplished ; and, without attempting a scientific description of the several parts of a locomotive engine, endeavour to understand the general principles on which they are commonly constructed.

The accompanying sketch does not, nor could it in so confined a space, exhibit every part of the beautiful machinery ; but sufficient is shown to enable us, if not to *see* how everything *is* done, to obtain a tolerable idea how it *may* be done.

We conclude that our readers are aware that water, when

THE RAILWAY AND THE STEAM-ENGINE.

heated to the boiling point (which, at about the level of the sea, is at two hundred and twelve degrees of Fahrenheit's thermometer) evaporates in steam. At this heat steam, under the ordinary pressure, requires about 1,700 times the space that was occupied by the water which produced it; and this very steam, at a still greater heat, will fill a space greater in proportion. Being compressed into a smaller compass, steam has an expansive force, greater or less in proportion to its heat; and in fact this force may be so tremendously increased by the continued increase of heat, that it has no ascertainable limit, as we can construct no vessel so strong that it would not be burst asunder by the steam confined within it and heated to a certain point.

To avoid the awful destruction attendant on the explosion of large boilers, the boilers of locomotives consist of a number of small metal tubes (2), which are kept constantly supplied with water from a cistern in the tender attached. If one of these tubes burst, the ex-

THE RAILWAY AND THE STEAM-ENGINE.

plosion is comparatively trifling, and the danger and loss of power but slight. The fire (1) in the hinder part of the engine is supplied with coke, through a door opening towards the platform on which the engineer stands. On the lower part of the opposite side of the furnace (the left hand side in the cut) is a grating for the admission of air to the fire ; and as this grating is towards the front, the air, as the engine rushes forwards, is met and forced through its bars with great velocity, so as vastly to increase the fierceness of the fire. The air, heated in passing through the fire, and mixing with the vapour of burning coke, is highly inflammable ; and thus the whole apparatus of tubes (2) which forms the boiler is completely enveloped in the fiercest flame, and steam is formed in the tubes with amazing rapidity and of great expansive force. The air and vapour of coke (which causes little if any smoke) having thus performed their office, rush up the chimney of the engine, and thus still further increase the draft of the fire (3).

THE RAILWAY AND THE STEAM ENGINE.

The steam thus generated in the tubes, following the course of the arrow downwards, is admitted by valves into the piston-box (5), but alternately before and behind the piston. In the cut the piston is at the half-stroke. We will suppose that the engineer, by turning the handle at 8 in the direction proper for his object, admits the steam *before* the piston ; (that is at 5 ;) the piston is thus forced backwards towards the end of its box. By its arrival there the valve, admitting steam into the *fore* part of the piston, is closed, and another valve, admitting it to the *hinder* part, is opened, and the piston is forced back again, when the process is repeated, and the piston is thus moved rapidly backwards and forwards by the admission and exclusion of steam alternately before and behind it. The piston-rod is attached by a hinge to what is called a pinion, which acts in the same manner as the arm of a man in turning the handle of a grindstone. As the man's arm, by being alternately thrown forwards and drawn back, turns round the grindstone, so the pinion

THE RAILWAY AND THE STEAM ENGINE.

turns round the large wheel in the middle of the cut, and this, revolving on the smooth iron railway, sets in motion the whole.

Now, it takes a great many words merely to describe, thus simply and unscientifically, how the steam, by forcing the piston backwards and forwards, thus sets the engine in motion ; and no one who has not seen a fast locomotive engine at work would imagine, from the description, the ease and wonderful rapidity with which it acts. On the Great Western Railway the engine frequently draws a long and heavy train at the rate of sixty miles in an hour ; and when unencumbered the same engine could, no doubt, be made to travel nearly twice as fast. However, we will suppose an engine to travel *thirty* miles only in an hour, or a mile in two minutes, and that its wheel is eighteen feet round, or about six feet in diameter. Now let us calculate how many strokes in a minute the piston must make to propel the engine at this rate. The

THE RAILWAY AND THE STEAM ENGINE.

wheel, being six yards round, must turn two hundred and ninety-three times and one-third (one-sixth of 1760) in the course of a mile ; two strokes of the piston are necessary to turn the wheel, therefore the piston must give five hundred and eighty-six strokes for every mile the engine travels. At our supposed speed of thirty miles an hour, that is of course five hundred and eighty-six strokes in two minutes ; two hundred and ninety-three in a minute ; nearly five in a second. Now, if we consider that the piston must be perfectly air-tight, and yet that it must glide up and down in its tube with such astonishing rapidity, and consider further that each little valve which admits or shuts off the steam must open and shut at every stroke of the piston with the nicest accuracy, we shall see that the machine must be most beautifully contrived in all its parts, most accurately adjusted, and most carefully tended. There must be no rust to corrode, nor grit to cause friction ; every screw, and bolt, and nut must be

THE RAILWAY AND THE STEAM-ENGINE.

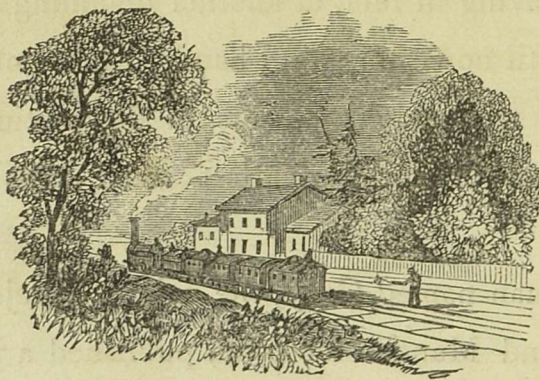
secure ; every valve must both fit closely and move easily : in short, every part must fulfil its office with the most exquisite ease and exactness.

It would be impossible here to explain all the wonderful contrivances by which the locomotive engine is made to perform all its functions. To bring it to its present state of efficiency for speed and power, some of the ablest men of our day have laboured through many an anxious hour—with many a hazardous experiment, advancing step by step from one improvement to another—here gaining more power, there an addition to speed—at one time effecting a saving in fuel, at another obtaining an increase of safety, until now, in careful hands, a locomotive engine, with all its tremendous powers of destruction, is more under control than the gentlest steed that ever lady rode.

A gentleman named Gray, the original projector of the Liverpool and Manchester Line, published a pamphlet in 1820, containing the following prophetic words :—“ Here

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is the mainspring of the civilization of the world: all distances shall disappear; people will come here from all parts of the continent without danger and without fatigue; distances will be reduced one half; companies will be formed; immense capital paid and invested; the system shall extend over all countries; emperors, kings, and governors, will be its defenders; and this discovery will be put on a par with printing." We all know in this day to what an immense extent it has been carried out; and probably many of our young readers will live to see Mr. Gray's prediction fully verified.





ARABIAN MAP OF THE WORLD.

ANCIENT MAP OF THE WORLD.

THE word map is an abbreviation of a Latin word, signifying a *napkin*; it is commonly applied to those drawings which represent the position and form of the various countries of the earth. Many conjectures have been made as to the time when the construction of maps was first attempted; and some writers have imagined that the Israelites were not ignorant of the art of making them, from the language of Joshua: "Ye shall therefore describe the land into seven parts, and bring the description hither to me, that I may cast lots for you here before the Lord our God." This certainly seems to favour the opinion; and we may reasonably suppose that the knowledge of this kind which

ANCIENT MAP OF THE WORLD.

the Jews possessed they derived from the Egyptians. The Greeks, who during the sixth and seventh centuries before Christ, were remarkable for their active commercial spirit, are said to have been assisted in their voyages by the nautical maps of the Phœnicians. Homer, in his wonderful poems, exhibits but little geographical knowledge, and seems to be acquainted with only a few countries in Europe, Asia, and Africa. With him the ocean is a great stream which encompasses the earth's disc ; and he not only applies to it epithets suitable only to rivers, but calls it more than once river-ocean. Anaximander of Miletus, who was born six hundred years before Christ, is said to have been the first person who constructed a map of the world ; and among the Greeks he had the honour of having *invented* maps. Herodotus, in his account of the interview of Aristagoras the Milesian with Cleomenes, King of Sparta, on the occasion of his soliciting help against the Persians, says that the Milesian had a " tablet of copper in his hand, on which was marked every known part of the

ANCIENT MAP OF THE WORLD.

habitable world, the seas, and the rivers." Strabo, who lived in the Augustan age of Rome, wrote largely on geography, and constructed a map of the world; it is, however, marked by many blunders. He makes the Pyrenees stretch to the north and south; represents the Caspian Sea as communicating with the Northern Ocean; puts Ireland to the north of Britain; and entirely leaves out the province of Brittany from the coast of France. Ptolemy, who was the next great geographer, commits similar errors, extending the Mediterranean Sea twenty degrees beyond its actual limits, and placing the mouth of the Ganges *only* forty-six degrees eastward of its true position. Some of the maps made during the middle ages exhibit ludicrous blunders: for instance, in some of them the old world is represented as an island, and Africa is nipped off north of the Equator. The engraving which accompanies this notice exhibits a little more skill than the instance just quoted; though China and Russia seem to be occupying very respectful distances from one another. The Moun-

ANCIENT MAP OF THE WORLD.

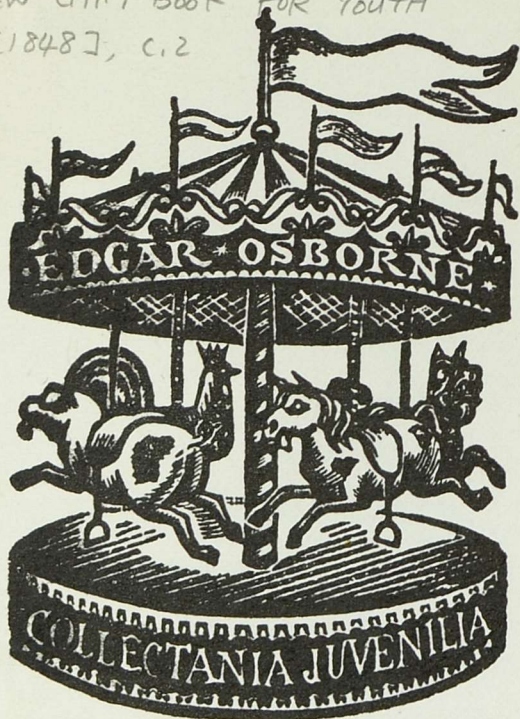
tains of the Moon, too, are sketched in a way quite peculiar: and we have no doubt that some of our young readers have declared before this, that they could draw a better map themselves. Of late the skill displayed in the construction of maps and globes is surprising; and they seem to be rapidly coming to perfection. Almost every child in our schools has truer ideas about the size, aspect, and relative positions of the different countries of the globe than were possessed by the wisest philosophers of olden times. Yet still we are not equal in the extent of our interest in geography, or our knowledge of it, to the Germans. Among them one class of hawkers, or pedlars, is composed of map-sellers. We think that it would be nearly starving work for anybody to journey through this country hawking maps.

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