

The Chimpanzee.

EXCELSIOR:

HELPS TO PROGRESS

IN

RELIGION, SCIENCE, AND LITERATURE.

“We live by Admiration, Hope, and Love ;
And, even as these are well and wisely fixed,
In dignity of being we ascend.”

WORDSWORTH'S *Excursion*, Book IV.

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EXCELSIOR.

HOW TO MAKE A FORTUNE.

Most nations inhabit countries ready-made. They land on an island, or they press onwards into some unappropriated wilderness, and there they sow fields and plant vineyards. But the nation of Europe, by far the thriftiest and most frugal, has in a great measure created its own country. By running out into the shallow sea dykes and embankments, and then pumping off the brine, the Hollanders have reclaimed a vast surface from the watery waste; and now on spots where fishes used to be caught, and where ships rode at anchor, cattle graze, gardens blossom, and people go out and in among the thriving villages.

To the people of the Netherlands their territory has been an excellent teacher. Says the shore gently shelving, "Take pains, and I will repay you. Drive a few piles, and wattle and puddle them, and at once you have an estate—a little croft of your own on which you may grow roots and herbs, or pasture kine. And if you take the produce to the nearest market, you will get money; and with that money you may hire labour and take in more land from this shallow ocean, or this oozy marsh; and thus, adding field to field, you may at last bequeath a goodly freehold to your grateful children." Which is just the philosophy of Industry. Every one of us is born on the edge of an ocean, not very deep at the margin; and under that ocean there

lies a boundless expanse of wealth, knowledge, moral worth, ascendancy over others: but every man has to conquer his own acquisition for himself. Many lazy or sanguine spirits are content to lie half slumbering on the shore. They hope that some happy morning fame, or a fortune, or a fine estate, may rise to the surface and come floating to their feet; and, whilst they drowse and dream, life wastes away, and they die inglorious and poor. But others begin the battle of existence like these brave old Batavians. They say, "I have a goodly heritage; but it is still under water. It is still a matter of faith; for it is a thing not seen as yet: but I must raise it from the deep; I must bring it to the light. I must redeem a little portion to begin withal; and when I have made sure of that first instalment, it will be a little capital on the strength of which I may proceed to conquer more."

Such, we repeat, is the philosophy of Industry. Solomon expressed it when he said, "The hand of the diligent maketh rich." The Saviour expressed it when He said, "To him that hath shall be given." It is by a process of steady industry and cheerful perseverance that the most learned man has reclaimed his information from the abyss of ignorance; and it is by a growth in goodness,—by line upon line and by improvement on improvement that the holiest man, with God's help and blessing, has gained for himself his present excellence and well-earned reputation. And it is of great moment to be rooted and grounded in this first principle—this universal law of individual progress. It is of great importance especially, our dear young friends, to you. The principle is, that however poor, ignorant, or prone to evil, we are born, God gives to each of us a glorious opportunity. If true to Him, and if rightly alive to our great advantages, we may make our fortune. We may become rich intellectually, morally, spiritually.

At the Roman Propaganda there are always in process of training, with a view to their becoming missionaries, young men from all the ends of the earth, and representing nearly all the races of mankind; and on the day which concludes the yearly session, it is curious to hear essays read and orations delivered in Italian, French, and English; Russ and Polish; Greek, Hebrew, and Arabic; Chinese and Hindostanee; Gaelic, Welsh, and Irish. And had you been present ten years ago, you might have heard an old man conversing fluently in every one of these, and if needful, speaking fifty languages "almost as correctly as a native." And you could not but have wondered at the prodigy; and, probably, the only explanation would have been, "Mezzofanti has been born a linguist." But Mezzofanti was born just such a linguist as the rest of us,—linguists who, for the first year or two, cannot speak our mother-tongue: and it was by diligently attending that, after learning his mother-tongue, he learned first Greek, and then other languages, till his one talent had gained fifty talents more.

So extended has the domain of science latterly become, that no man now has universal learning; but two hundred years ago, there were such men. And it was an august and impressive thing to look upon Bacon, or Grotius, or Selden, and think, "There is a living encyclopædia. There is a man who knows all that is knowable—a man who has taken a survey of all nature, and who has read the story of the world." And yet there was a day when that paragon of erudition knew nothing: there was a day when every page of that living encyclopædia was still blank paper: and it was by steady perseverance, stumbling over many difficulties, and denying himself many youthful indulgences—it was by bracing up the spirit, and bringing the body under—that at last he came in the pantathlete, the victor of all fights, and the winner of every prize.

And so, youthful reader, you who are still at school or college, or who having quitted them have not yet lost the learning faculty, God invites you to a splendid heritage. You have your choice. As the subject of your study, you may select the glories overhead or the wonders under-foot,—the architecture of the starry canopy or the structure of the solid globe. You may try to investigate those mechanic or mimetic arts in which the hand of man multiplies its force in overwhelming enginery, or evokes and expresses the indwelling spirit in its painted or sculptured creations. You may prefer the treasures of beautiful thought and exquisite diction which have descended to us in the cold but pellucid page of classic authorship, like Alpine relics entombed in their crystal catacombs; or you may devote yourself to glean the wisdom and the momentous lessons for the future which come hurtling down the noisy stream of modern history. But whatever topic you select, be sure that it is worthy, then cling to it and work it well. The hour of study which the dishonest scholar spends in shamming, in gazing at a task which he is not learning, or in copying a theme which he has not composed,—do you bestow in earnest industry; and the evening hour which idle companions spend in mischief, in sport, or in needless slumber, do you employ in mastering the solid book, in writing out your abstract, or in revising former acquisitions. And thus, although you should not become a first-rate scholar or a famous sage, you will amass a fund of information which will enrich all your future years, and which, whilst embellishing every sphere you fill, and adding to your mental stature, will unspeakably enhance your power to serve your generation.

And what is true of mental acquirements is true of moral conquests.

In surveying any finished specimen of Christian excellence, we are apt to fall into one of two mistakes. We are

apt to imagine that goodness so pre-eminent is the result of some peculiar natural felicity; or we excuse ourselves for our own short-coming by ascribing it entirely to some arbitrary operation of God's Spirit, who has been kinder to that man than He is disposed to be to us.

Now, it is very true, that some have natural exemptions from faults by which others are beset; and it is equally true, that there is no genuine goodness in the soul of man of which the source must not be sought in the Spirit of God. And yet it is just as true, that with or without natural felicities, all the noblest characters in the annals of true piety are characters which have grown by degrees, and which have got on by instalments. It is just as true that the men who have "grown in grace" are the men who have "given diligence;" and that the men whom the Spirit of God has really "worked in" are the men who have "worked out" their own salvation.

Let us then turn to those who have been brought to choose the better part and the holier life, and who in Christ Jesus have found the motive to a new and holy ambition, as well as the model of all excellence. And to such we do not scruple to say, that to their moral and spiritual attainments there need be no limits, save the limits of humanity. Looking, then, into the "law of liberty,"—that standard of excellence which insists on attainments so high, yet leaves scope so ample for free and individual development,—are you struck with the beauty of holiness? Do the lives of its worthies fill you with emulous admiration, and do the beatitudes of the Master strike you with a humbling despair? Would you give the world for the boldness of Elijah or the meekness of Moses,—for Joseph's purity or Daniel's devotion? And when you think how bright was the career of John and Paul, and the Apostle-like men who have followed,—as you kiss their beautiful footsteps and weep over them

tears of envy,—does the wonder ever cross you, whether, indeed, it be possible still thus to burn and shine on the way to everlasting blessedness? And would it be more to you than a kingdom or a crown if you could hope to follow those who along a path so heavenly have passed away to a world so holy and a society so sublime?

Then, such distinction may indeed be yours. Setting your eye on the Great Example,—surrendering to the guidance of God's Word and Spirit,—you may not be a second John, or a second Enoch, or a second Paul; but, what is far better, you may become the disciple needed in the present day,—the epistle of Jesus Christ as adapted to the present age, as were these others to their living time. But into that full-grown and finished piety, no magic will transform you,—no momentary aspiration, nor passing effort will uplift you. It will be the result of patient and persistent years,—the return to many and importunate prayers,—the reward of a protracted struggle,—the achievement of a perseverance which, if vouchsafed at all, you will be the first and faintest to confess is the gift and doing of God's good Spirit.

But if it is to be yours, sincerity will commence at once. Your Christian character is yet to form; and it is wisdom's part to begin to-day. The visionary may lie upon the beach and lounge away the summer, picturing his Atlantis,—his Elysium rising from the deep; but the man who is really on the way to wealth is the man who is driving his stakes, and running out his rampart, and rescuing from the muddy tide a few roods of the submerged surface. Be you that man. Be you the man who begins to-day. Be you the man who confesses, "At this moment there dwelleth no good in me. My better character is all to form; and if it ever come into existence, it must be as a reprisal from the howling deep of ungodliness, the troubled sea of sin. But

I can do all things through Christ strengthening me. 'To His service and honour I devote myself, and in His strength and name I would at once go forth against my besetting sins. And if He will kindly strengthen me, I may hope to gain some ground even before this evening's setting sun.'" And armed with this mind, a few days of prayerful watchfulness would do more than years of barren speculation to cure your faults, to confirm your faith, and to improve your character.

It is to be feared that many persons forfeit their opportunity, and fall short of everlasting life, for want of these two things,—precision and promptitude. Instead of doing something definite, they are content with vague generalities ; and instead of doing instantly what their hand finds to do, life slips away in the daily intention to begin to-morrow. To illustrate what we mean :—In his Second Epistle St. Peter says, " Give diligence to make your calling and election sure," or in one word, " Give diligence to ensure salvation." And this counsel is quite general ; but in the parallel context it is opened up into various particulars, and the same Apostle, who in the tenth verse says, " Give diligence to make your calling and election sure," in the fifth verse says, " Giving all diligence, add to your faith, virtue ; and to virtue, knowledge ; and to knowledge, temperance ; and to temperance, patience ; and to patience, godliness ; and to godliness, brotherly-kindness ; and to brotherly-kindness, charity ; for if ye do these things, ye shall never fall ; and so an entrance shall be ministered unto you abundantly into the everlasting kingdom of our Lord and Saviour Jesus Christ." And you can easily understand the value of these particulars. It is as if a father were in one case saying to his son, " Try to earn a competence ;" and in the other, " Try to add to this house a field ; and to this field a thousand pounds of funded money ; for if you do that you won't fall into absolute penury ; you will have a provision for sickness or old

age." It is as if one man wrote on the first page of his New-year's Journal, "This year I shall give diligence to improve my mind;" and another wrote, "This year, by giving diligence, I hope to add to my knowledge of French the rudiments of Greek; and to the Greek Grammar I hope to add the study of the New Testament in the original tongue; and to the study of the Greek Testament I hope to add the perusal of Neander's History; and to Neander I hope to add D'Aubigné." Is it not evident that by giving a definite aim this precision would give heart to diligence, and is it not a more hopeful promise than vast and high-sounding resolutions?

So says the Apostle, not vaguely nor as one beating the air, "Add to your faith courage. You say that you believe in Christ; confess him. And to courage add knowledge,—a large acquaintance with God's truth,—a sound and enlightened understanding. And to knowledge add temperance,—self-mastery, superiority to sensual delights, abstinence from evil. And to temperance patience,—fortitude in pain, forgiveness of injuries, meekness and magnanimity. And to patience godliness,—a devout and adoring spirit,—that frame of mind to which God is the nearest Presence and a present God the chiefest Joy. And to godliness brotherly-kindness,—that new affection to which the Church is the adopted family and to which the friends of Christ are dear as brothers. And to brotherly-kindness add charity,—that benevolence which has a helping hand for every need and a sympathy for every sorrow."

Those who live on a peradventure are too likely to perish. You fancy that you have hold of a rope which can draw you a thousand feet,—even to the top of this precipice; but let us see if you have such a hold as can lift you to the lowest ledge,—as can even raise you from the ground. You hope that you have faith; that is, you hope that you have such a grasp of the Gospel as can draw you up to Heaven:

But let us see if you have such a grasp as can lift you above one besetting sin,—as can elevate you to the lowest platform of Christian holiness. Test your faith in Christ and evince your own sincerity by keeping one of His commandments.

And brought to this simple test, is the Lord Jesus to you so really living and so present,—so dear and so divine that from knowing the grief which the sins of others gave Him and the delight which goodness always yields Him, it is at least your occasional effort to do such things as He Himself and His loved disciples did,—at least your frequent effort to resist and vanquish evil? Are you giving such diligence to make your calling and election sure, as to be giving diligence to cultivate any single attribute of the Christian character? the patience or the brotherly-kindness, the godliness or the charity? Or with the red-cross ensign at the head of the mast and the helm in the hand of presumption,—are you yielding to the course of this world and floating securely through the fog, as if the course of this world would not end in the engulfing eddy and drown you in perdition,—a namer of Christ but no departer from iniquity,—a sayer of “Lord! Lord!” but no doer of the things which the Saviour commands you?

And if there is danger in vague generalities—if, in the concerns of the soul, there is need for the same closeness of inquiry and minuteness of inspection which we devote to the perishing interests of time, and without which our most flattering hopes would only prove illusion and disaster—there is wisdom in promptitude. If, then, the misgiving crosses any mind, “Mine is the Christian creed rather than the Christian character,” you have need of instant diligence, lest, after all your profession, you fall at last, and miss in the end an entrance into the kingdom of our Lord and Saviour Jesus Christ. Temptations await you. Even whilst you are reading this paper these temptations stand

round you; and as soon as you have laid it down some of them will be sure to accost you,—temptations to anger, to duplicity, to dissipation, to indolence, to self-display. But still nearer than these temptations is your omnipresent Lord and Master. Before going farther would it not be well to kneel down and cast yourself on His gracious protection; and, advancing in His name and strong in His recollected presence, you may find yourself more than conqueror. Should He thus perfect His strength in your weakness, betwixt the actual work overtaken, and the happiness diffused by courteous words, kind looks, and friendly offices, He may give you the comfort of a well-spent day, and so inspire with fresh hope the prayers and efforts of the morrow.

Or, should you fall short—should you fail of your desire and endeavour, the very disappointment may do you good, if it leads you to add more devotion to your diligence. There is an undevout diligence which makes a man pert and self-conceited, and which gives him a Laodicean complacency, “I am rich, and increased in goods,” whilst the Saviour, who knows his works, declares, “Thou art wretched, and poor, and miserable;” and there is an orthodox indolence which, by high-pitched profession, tries to make up for defective practice—a Sardian self-deception which has a name to live and is dead, and to which the Saviour says, “Be watchful, and strengthen the things which remain that are ready to die: for I have not found thy works perfect before God.” But that is the truly Christian temperament where the devotion is diligent and the diligence is devout—where, like Smyrna, the man knows his poverty, but where knowledge of that poverty sends him to the Saviour, and that Saviour in the very act of strengthening him says, “I know thy poverty; but thou art rich:”—the prayer which is the root and prelude of action—the action which is the Amen to prayer.

AMOS LAWRENCE.

A FEW months ago we received a memoir, privately printed, of this munificent American citizen, and grudged that the lesson of such a life should be as "a well shut up, a fountain sealed." And now that publication has made it the property of the world, we do not know that the opening year can supply a better model to young men.

Amos Lawrence was born in Groton, Massachusetts, April 22, 1786. His father was highly respected in his neighbourhood, being a justice of the peace and a deacon of the church. He had fought in the battle of Bunker's Hill, where a bullet passed through his beaver hat, cutting his hair from front to rear, whilst a spent grape-shot struck his arm without breaking it. His mother was not only a pious woman, with warm and endearing affections; but she retained the old Puritan strictness, enforcing unhesitating obedience on the part of her children; and she proved a notable housewife in days when the hum of the spinning-wheel and the clack of the hand-loom were a familiar music in the rural homes of New England.

Furnished with an excellent education, and well aware that he had to make his own way in the world, at fourteen years of age young Amos was sent as an apprentice to a country store. Here, as it was his vocation to sell hats and hosiery, Bibles and broad-cloth, reaping-hooks and puncheons of rum, he had an excellent opportunity for gaining insight into general business. Moreover, it fell to his lot to dispense drugs to all the district; and so skilful was the young apothecary, that instead of the more circuitous route of first consulting the physician, many of his customers went to Amos direct for a dose. But a still more dangerous department

was the dispensing of intoxicating liquors. Near noon every day the whole neighbourhood came to the store for a stimulating beverage which it was the duty of the clerks to prepare. After a few weeks young Lawrence found that he had learned to like it too much, and with that youthful heroism which is the prognostic of future eminence he resolved to take no more of it; and thus he was the only one out of many lads, before and after, in the same store, who did not fall into habits of dissipation. His experience is worth transcribing, as he relates it to a young student at college:—

“We five boys were in the habit, every forenoon, of making a drink compounded of rum, raisins, sugar, nutmeg, &c., with biscuit, all palatable to eat and drink. After being in the store four weeks, I found myself admonished by my appetite of the approach of the hour for indulgence. Thinking the habit might make trouble if allowed to grow stronger, without further apology to my seniors I declined partaking with them. My first resolution was to abstain for a week, and when the week was out, for a month, and then for a year. Finally, I resolved to abstain for the rest of my apprenticeship, which was for five years longer. During that whole period I never drank a spoonful, though I mixed gallons daily for my old master and his customers. I decided not to be a slave to tobacco in any form, though I loved the odour of it then, and even now have in my drawer a superior Havana cigar, given me not long since by a friend, but only to smell of. I have never in my life smoked a cigar; never chewed but one quid, and that was before I was fifteen; and never took an ounce of snuff, though the scented rappee of forty years ago had great charms for me. Now, to this simple fact of starting *just right*, am I indebted, with God’s blessing on my labours, for my present position, as well as that of the numerous connexions sprung up around me.”

In April 1807, he became of age, and in his father’s one-horse chaise, with twenty dollars in his pocket, he drove into the city of Boston. Here he became clerk in a mercantile concern, and here he took up his abode as a boarder in the house of a widow. At his suggestion a rule was adopted, requiring silence in the public room for an hour after

supper. The object of this was to secure, for all who desired it, an hour of undistracted study; and the consequence was, that the boarding-house soon attracted to itself the most quiet and improving set of young men in the city. Those who did not like the regulation went out to the theatre, or elsewhere, and "to a man, became bankrupt in after-life, not only in fortune but in reputation:" whilst a majority of the sober set sustained good characters, and not a few of them rose to important positions.

Although with a scanty capital, he soon embarked in business for himself, and that at a period so trying, owing to the embargo, that many persons were abandoning commercial pursuits altogether. But Amos Lawrence started on principles which made it pretty certain that if his business did not enrich himself, it should not injure others. He kept an accurate account of his daily purchases and sales, with a statement of his daily profits; and "taking stock" once a-year, he early adopted the rule of always having property to represent at least forty per cent more than he owed. Acting on the most rigid economy, he never allowed himself to spend "fourpence" on unnecessary objects till once he had acquired it; and for the first seven years of his career he never allowed a bill against him to stand unsettled over Sabbath. His punctuality and uprightness soon gained him a good name; and the promptitude with which he acted, in his own language, enabled him "to take the top of the tide, whilst others waited till half-tide, and so got upon the flats." In this respect he soon had a partner to his heart's content in his younger brother, Abbott, whose "single eye" and vigorous understanding were peculiarly fitted for rapid and decisive movements, and who did good service to the rising house by embarking in the first ship which sailed for England after the peace, and sending back a cargo of goods, which reached Boston in eighty-three days after his own departure,

—an expedition deemed quite wonderful forty years ago. In the first year the profits of his business were 1500 dollars; in the second year they were 4000 dollars; and, in 1842, they had become as great as Mr. Lawrence thought “would be good for his descendants;” and thenceforward he became his own executor. As has been truly remarked by his accomplished son and affectionate biographer, “He was a living example of a successful merchant, who had, from the earliest period of his business career, risen above all artifice, and had never been willing to turn to his own advantage the ignorance or misfortune of others. He demonstrated in his own case the possibility of success, while practising the highest standard of moral obligation. He had ever commanded the confidence of those around him. When an apprentice in his native town, many of his customers relied upon his judgment rather than their own. He never deceived them, and early adopted as his rule of life, to do to others as he would have them do to him. Thus he stood high in the confidence, as well as in the estimation, of his neighbours. What ‘Amos’ said was right, and no one could gainsay.”

The basis of this integrity, and consequently of this success, was the fear of God. The lessons of a Christian home were blessed, and his pure and exemplary outset in active life confirmed into a piety growingly deep and decided. At his first coming to Boston he attended the church in Brattle Street, and his connexion with the Unitarian body, in common with so many of the influential citizens of Boston, he retained to the last. But the creed of Mr. Lawrence was very different from the christened deism of Belsham and Priestley; and in feeling and spiritual affection it would have been difficult to perceive any distinction betwixt him and the professors of the orthodox faith, whilst the benevolence of his spirit, his love to his Father in heaven, and the sunshine of his

heart, were such as any Christian might envy. In these "beauties of holiness" his letters and journals abound, and as illustrative of his inner life we may bring together a few scattered specimens:—

"What shall I render unto God for all these benefits? I feel my unworthiness, and devoutly pray that I may never lose sight of the great end of my being; and that whenever it shall please Him to call me hence, I may be found in the company of the redeemed, through the merits and mediation of the Son of His love."

"While my family are all absent at church [he was ill], I am sitting alone, my mind going back to the beginning of the year just ended, and forward through that just commenced; and, in view of both periods, I can see nothing but the unbounded goodness of our heavenly Father and best Friend, in all that has been taken from me, as well as in all that is left to me. Among my sources of happiness is a settled conviction that, in chastening His children, God desires their good; and if His chastisements are thus viewed, we cannot receive them in any other light than as manifestations of His fatherly care and kindness. Although at times 'clouds and darkness are round about Him,' we do certainly know, by the words of inspiration, 'that justice and judgment are the habitation of His throne,' and goodness and mercy the attributes of His character; and if it should please Him further to try me with disease during the period of my probation, my prayer to Him is that my mind and heart may remain stayed on His, and that I may practically illustrate those words of our blessed Saviour, 'Not my will, but Thine be done.' It is quite possible that there may still be a few years of probation for me; but it is more probable that I may not remain here to the close of the present; but whether I remain longer or shorter is of little consequence, compared with the preparation or the dress in which I may be found when called away. It has seemed to me that the habit of mind we cultivate here will be that which will abide with us hereafter; and that heaven is as truly begun here, as that the affections with which we love our friends grow stronger by use and improve by cultivation."

For the last twenty years of his life the health of Mr. Lawrence was extremely delicate, and it was only by the most scrupulous regimen that his life was preserved. With wealth which commanded every luxury, he had often to dine

on an ounce or a little more of coarse bread, soaked in three gills of gruel, and never took a meal in the midst of his family. Yet few had a more exquisite enjoyment of existence, or a more overflowing sense of God's goodness. As one morning he writes to his sister, "This morning seems almost like a foretaste of heaven. The sun shines bright, the air is soft; I am comfortable, and expect a pleasant drive in the neighbourhood. It is, indeed, brilliant, beautiful and interesting to me, beyond any former experience of my life. I am the happiest man alive, and yet would willingly exchange worlds this day, if it be the good pleasure of our best Friend and Father in heaven."

Nor were these the transcendental feelings produced by invalidism. Long before his seizure we find him writing to his brother:—

"I feel very healthy and very happy; my wife and children all enjoying health and a good share of the bounties of Providence in various ways. Well you may be contented, you will say. What more is wanting? Such is not always the lot of man possessing those blessings. There is often a voracious appetite for other and greater blessings. The desire for more splendour, the possession of more wealth, is coveted, without the disposition to use it as an accountable creature; and too late the poor man finds that all his toil for these earthly objects of his worship fails in satisfying or giving a good degree of content. I, therefore, have reason for thankfulness that I am blessed with a disposition to appreciate tolerably the temporal blessings I enjoy. To the Father of all mercies I am indebted for this and every other good thing; even for the increased affection with which I think of you. That He may bless and keep you, dear Abbott, is the prayer of your brother."

Few persons have tasted so largely the happiness of doing good; and perhaps it was the only pleasure in which he was an actual epicurean. But he had two or three rooms in his house filled with useful articles for distribution, including vast quantities of books and materials for clothing; and in this charity-store, on rainy days, he passed many

hours together, assisted by his coachman, selecting and packing up in bundles as large as "small haycocks," contributions to the comfort of his poorer brethren; and in these exertions he often induced fits of serious illness. Students and ministers of the Gospel were the special recipients of his bounty; and when the gift was not anonymous, a kind and cheering note went with it, often enclosing besides a sum of from five to fifty dollars. These benefactions were restricted to no "ism," but were indiscriminately bestowed on deserving men of all communions.

The brothers felt a profound and enlightened interest in the educational institutions of their country. To the academy at Groton, where they were educated, William gave a sum of 45,000 dollars. To Harvard College Abbott gave a donation of 50,000 dollars, with which the Lawrence Scientific School was soon afterwards founded. And from being attracted towards it by President Hopkins, one of the most eloquent expounders of evangelical truth on the American continent, Amos took Williams College under his especial protection, and in the course of a few years devoted to it from 30,000 to 40,000 dollars. In the last ten years of his life the contributions of the latter, in various forms of benevolence, amounted to at least half a million of dollars.

Amos Lawrence expired on the last day of 1852. His younger and much-loved brother, Abbott,—for some years the representative of his country at the Court of St. James's, and so distinguished by the urbanity of his disposition and the native nobility of his spirit,—only survived till August 1855.

J. H.

THE WITCHES' DANCE ON THE BROCKEN.

AMONG all the legends of Germany—that country where every plain has its genius, every mountain its giant, every grotto its dwarf, every house its domestic sprite or Cobold, every historic fact its myth—there is, perhaps, not one of them all so popular, or so universally known, as that of the Witches' Dance on the Brocken. This general diffusion, with the hold it so long maintained on the belief of the people, makes it hardly possible to doubt that it has its origin in some historic fact; and it is believed that this attempt to trace it to its source may not be without interest to many. The scene of this well-known legend, the Brocken, or Blocksberg, is the loftiest summit of that range of mountains on the confines of Hanover, called the Hartz, extending about seventy miles in length, and twenty in breadth. On this spot, according to the story, the witches and sorcerers of the whole earth hold their sabbath once a-year, upon the eve of May-day. Thither from all quarters these servants of Satan repair, mounted, some on horses, some on goats and wild beasts, some on pitchforks and brooms, and flock around their infernal master, when, after due homage paid to him, the unholy orgies commence. Brandishing torches, they dance around a blazing fire, with wild cries, till summoned before "the Devil's Pulpit"—a mass of granite thus named, and only very recently destroyed—where they alternately listen to his instructions, or recount their own exploits, making the air resound with blasphemies against God; and at length the hellish festival closes with a banquet, which consists entirely of sausages dressed on "the Witches' Altar," unless, indeed, a head-dish should be supplied, by the dismembered body of one of the confraternity.

For should a witch arrive too late, this breach of proper etiquette is punished by a fearful death. She is torn in pieces by Satan himself, and the severed limbs, after being laid on the altar, figure at the feast, as a warning to the rest. With the morning dawn, the fiendish crew disperse to their several quarters. The inhabitants of the district round the Brocken are in the habit of setting up three crosses at the doors of their houses and stables, by which they imagine they secure both themselves and their cattle from all the wiles or assaults of sorcerer and demon, on their way to and from the place of rendezvous.

Such is the legend; and we believe it to be a myth—the people's mode of chronicling a real event, a historic fact. Wild and absurd as are the scenes and circumstances in the tradition, and lamentable as is the superstition that gave them this form, we think that we can trace them up to real occurrences, and that those occurrences are to be found in the history of that illustrious Emperor of France, who, for his single-handed struggle against ignorance, barbarism, and lawlessness, has been so regarded as the very type of greatness, that his name and the name of Great have been blended into one—that of Charlemagne. In his treatment of the Saxons conquered by him, we have the germ of this popular tradition.

While in some respects his treatment of them, as of the other nations he subdued, was worthy of him, as he extended to them equal privileges with the Franks; and while he was right in thinking, as he did think, that his work of civilisation could be successful only as long as it was based upon religion, yet he unhappily yielded to an unenlightened zeal, and instead of employing mild persuasion to turn them from their "idols, to serve the living and true God," he thought to compel them, at the point of the sword, to take upon them the yoke of the meek and lowly Saviour, the Prince of Peace;

and he enforced the profession of Christianity under severe penalties, thus degrading the Divine laws, by turning them into civil enactments. True it is that he at first showed great toleration ; but during the three-and-thirty years which it cost to subdue this bold and free people, they tried the conqueror's patience to the utmost by their repeated revolts after submission, and by their frequent relapses into idolatry after a profession of Christianity ; till, at length, Charlemagne issued an edict, that any one refusing to be baptized, or after baptism continuing in idolatry, should be put to death.

But while the pagan Saxons were thus compelled to outward conformity, and to receive baptism, still they remained pagans at heart ; and no sooner had Charlemagne withdrawn his troops, than they recommenced sacrificing to their gods. Upon this, Charlemagne had the altars and images of the idols destroyed ; and, thus prevented from celebrating their worship openly, the people repaired to the forests and mountains of the Hartz, selecting the Brockenberg as the least accessible. No sooner was Charlemagne made aware of this, than he ordered strict watch to be kept at the mountain-passes on the days usually set apart for the idol-feasts. The Saxons had now recourse to stratagem, in order still to find means of solemnising their religious rites. Disguising themselves in the skins of beasts, and wearing hideous masks, and armed with pitchforks and other rustic implements, as well as with the weapons used by them in the chase, they rushed upon the sentries, who, in real or pretended terror, took to flight. Some of these implements were probably needed for their sacrifices, either in piling up the wood, or drawing out the firebrands, which they bore aloft as they danced in wild joy around the sacrificial flames. And as to the brooms, upon which, according to the legend, the Witches of the Walpurgis-night used to ride, they may have been in requisition to sweep away the snow, which

even now, on the first of May, covers the tops of the Hartz mountains, lying thick upon the Brocken.

Now it is certain that not only the Jews, but the early Christians, believed that the gods worshipped by the heathen were really existing evil demons. This, we think, has been fully shown in an article in a late Number on the Evil Angels.* Not only do we find, as has been pointed out, Beelzebub, the god of Ekron, the god of the Philistines, called by the Jews "the Prince of the Demons;" but we also find the Apostle Paul saying, "The things that the Gentiles sacrifice, they sacrifice to demons, and not to God; and I would not that ye should have fellowship with demons." Indeed, the very name "demons" was applied by the heathen themselves to the beings they worshipped. And the Christians of Charlemagne's day held not less firmly the belief that idol-worship was demon-worship; so that their describing the Saxon rites as such would have been both true and natural; and the addition of other circumstances to this basis of truth is easily accounted for by popular superstition. The delusion embodied in the legend, that Satan himself, the great leader and prince of the evil spirits, appeared in bodily form and horrid shapes, and contrived, in spite of the Christian guards that beset the way, to convey the worshippers through the air to the Brockenberg, was produced, or kept up, by the stories which the sentinels either told as an excuse for their cowardly flight, or dared not contradict.

Such are the facts which we believe to be bodied forth in this myth of the Witches' Sabbath on the Brocken. And though we cannot give a positive answer to the inquiry, why the special day named in the legend was fixed upon, yet we think a very probable one may be found. As we know that the pagan Germans celebrated one of their great-

* See also Archbishop Whately's "Scripture Revelations of Good and Evil Angels."

est and most joyous feasts—the feast of the returning Spring—on the first of May, and consequently about the time of our Easter; as on that occasion they were wont to deck their altars and houses with boughs and branches of birch-trees, and to dance with them round their immense sacrificial fires. And again, as this feast was specially dedicated to their goddess Eastera, the object of peculiar veneration in this very district of the Hartz, so it is more than probable, that the great attraction which this festival of the first of May had for the Saxons gave rise to the fable of the special concourse of witches on Walpurgis-night; and the fact of its being so called from the name of a saint said to have converted the Saxons to Christianity, seems a fresh link connecting it with their religious history. The custom still prevalent in Germany, and amongst us, of decorating the churches and houses with green boughs at Easter and Christmas, appears to be a remnant of the ancient pagan rites, as well as the less pleasing practice of the young village lads in and about the Hartz district of dancing round a large fire. Many such vestiges are to be found in our own country; and I have little doubt that the custom, in some parts of England, of strewing the church-aisle with rushes at Whitsuntide may be traced to our Pagan and Saxon ancestors. It need hardly be pointed out that the word Eastre, the name of the Saxon goddess, has passed from Paganism into the Christian Church. Whatever may have been the original cause of this, and many a similar, transition or adoption, every one of them may well be to us a monument of the grace that has “called us out of darkness into the marvellous light” of the Gospel.

A. H.

THE CHIMPANZEE.

HOWEVER humiliating it may be to our pride, there is no denying that some of the members of the class Mammalia bear considerable resemblance to the "lords of the creation." The ancients were familiar with this likeness, and one of them has very tersely expressed it in the line,—

"Simia, quam similis, turpissima bestia, nobis!"

Man, or "*mon*," as it is in the native Doric of Yorkshire and the south of Scotland, *mannikie* and *monkey*, sufficiently indicate what, though very distant, is still a kind of relationship. Naturalists and physiologists now write treatises on the "Anthropoid," or man-resembling, apes of West Africa, and of Borneo, and the adjacent parts. The human inhabitants of the same countries used to tell our old voyagers, that these apes were a degraded race of men, who would not speak, lest they should be forced to work. But the labours of anatomists and philosophers, from the times of Dr. Tyson to those of Professor Owen, have shown that the most man-like of the monkeys is, in structure, essentially distinct from the most degraded member of the human family:—

"Os homini sublime dedit, cœlumque tueri."

In the great memoirs of the Hunterian Professor on the skeletons of the Chimpanzees and the Ourangs in the first three volumes of the "Transactions of the Zoological Society," these distinctions are clearly pointed out, but are too many to be even briefly recapitulated here. At the meeting of the British Association in 1854,* he indicated some characters of the skeleton of the apes, such as the great super-

* "Report of Brit. Association held at Liverpool," pp. 111, 142.

orbital ridge in the largest Chimpanzee, "which could not have been produced by the habitual action of muscles, or by any other known influences, that, operating upon successive generations, produce change in the forms and proportions of bones." Professor Owen affirmed that the equable length of the human teeth, the concomitant absence of any interval in the dental series, and of any sexual difference in the development of particular teeth, were "primitive and unalterable specific peculiarities of man." He showed that "man is the sole species of his genus—the sole representative of his order, and has no nearer physical relations with the brute kind than those which arise out of the characters that link together the great group of placental Mammalia, called Unguiculata."

There are two or three species of the order Quadrumana,* which are specially named "Anthropoid." These are the red Ouran outang of the Malays, and the black Chimpanzee, and the large black and greyish-haired Gorilla of Western Africa. Many naturalists are inclined to regard the two latter as forming but one species,—the singular animal which forms the subject of our present notice.

The Chimpanzee (*Troglodytes niger*) is familiar, at least in its young state, to most of us, as several specimens have been exhibited during the last few years, and have attracted attention by their human-like aspect and the gentle melancholy of their look and manners. It was strange, too, to see the childlike way in which they wrapped themselves up in a blanket, or drew it around them, to keep them warm in a climate the very opposite of their own, which has been termed, from its fatal influence on Europeans, "the white man's grave." No matter how much the care of the curator, or how close-fitting and warm the gay striped woollen shirt in which the black exotic stranger was invested, a few months'

* So called from all the four legs being used at times as hands.

residence in our changeable climate, and perhaps also the completely different diet, rapidly carried it off. One day we might be amused with the strange strength with which the Chimpanzee hung by the arm from a bough in the well-fitted cage, and on returning in a week the poor creature was no more. In their native land the Chimpanzees avoid the abodes of men, and build their habitations in trees at a height of twenty, thirty, or even forty feet from the ground.* Although in the adults the canine teeth are strongly developed, they are said to exhibit no carnivorous propensity, using these teeth principally as defensive weapons. They live on fruits, and are also particularly fond of the upper part of the stipe of the palm-nut, formed of the young succulent leaves, and called by the Europeans "the cabbage." The natives say, that they have learned from the Chimpanzee, that this part of the palm is good for food, and they judge in the case of fruits, that "what is good for monkey is good for man." They are most expert climbers in their gambols, swinging from branch to branch, and leaping with astonishing agility. Waterton pictures it, when its hour of frolic is expended, squatting on its hams, and sitting "bolt upright; no other part of its body coming in contact with the tree, except the soles of the hind-feet, which are most admirably constructed to maintain it in this attitude. In this position its belly, of enormous dimensions, will be properly supported; whilst the fore-legs are either folded on the breast, or moved in playful gambols, or employed in scratching the body, or in conveying food to the mouth." Dr. Savage describes the Chimpanzees as being very filthy in their habits, and reports that the natives of Western Africa have a tradition that they were once members of their own tribe, but for their depravity were expelled from their com-

* Dr. Savage and Dr. Wyman, "Observations published in the Boston Journal of Nat. Hist." vol. iv. pp. 377, 386.

munity. Notwithstanding their tradition, the Chimpanzees when captured are eaten by them, and if cooked with the oil and pulp of the palm-nut, are regarded as highly palatable.

Lieutenant Sayers* found the Chimpanzee abundantly on the northern shores of the River Sierra Leone. He considered them to be gregarious, as, when visiting the rice-farm of an African chief there, the cries he heard plainly indicated the close vicinity of a troop, as the noise must have been produced by at least nine or ten of them. The natives told him that these apes always travel in strong bodies, armed with sticks, which they use with much dexterity. He says they are extremely watchful, and that the first one who notices the approach of a stranger utters a protracted cry, which greatly resembles that of a human being in extreme distress. The Lieutenant says, "The first time I heard it, I was much startled; the animal was apparently not more than thirty paces distant, but had it been five I could not have seen it, from the tangled nature of the jungle, and I certainly conceived that such sounds could only have proceeded from a human being who hoped to gain assistance by his cries from some terrible and instant death. The native who was with me laid his hand upon my shoulder, and, pointing suspiciously to the bush, said, 'Massa, baboo live there!' and in a few minutes the wood appeared alive with them, their cries resembling the barking of dogs." This writer tells us, that the natives of the Bullom country usually have plantations of bananas, papaws, and plantains, near their rice-fields, which attract these creatures; but they do not like to take them alive, as they believe the Chimpanzee possesses the power of "witching."

In the Paris Exhibition of this year there was a notable stuffed specimen of an extremely old Chimpanzee, or of that variety or species of it, according to some naturalists, called

* "Proceedings of the Zoological Society," 1839. Pp. 28-31.

the Gorilla. The name *Troglodytes Gorilla* has been given to it, the latter being the term used by Hanno in describing the wild men he discovered on the coast of Africa during his famous voyage. The Gorilla reaches the height of five feet, according to Dr. Savage. It is reported by the natives to be indescribably fierce and dangerous, and as being killed by the elephant-hunters only in self-defence. Captain Wagstaff, a trader between Bristol and the West African river, the Gaboon, succeeded in getting some skulls of it, and informed Mr. Stutchbury that, when the natives succeeded in killing one of these gigantic apes, they made a "fetish" of the skull. The specimens he brought bore indications of the sacred marks, in broad red patches crossed by a white stripe; and it was with great difficulty he procured them, owing to the superstitious reverence which the natives exhibit towards these hideous remains of their dreaded enemy.

Mr. Warwick says that the cough of the Chimpanzee is remarkably human-like in sound; he records of a specimen in the Surrey Zoological Gardens, that when a fit of coughing came on, he usually had some sweet-meat or cordial given to stop it; and so fond was he of this, that he soon, child-like, adopted the cough as a mode of obtaining these additional luxuries.*

This specimen died of disease of the lungs, and, during his illness, endeared himself to all who saw him by his pitiable looks and the placidity and gentleness and patience which he showed, notwithstanding his evident sufferings. Mr. Warwick says, "When he could no longer swallow food, the quiet manner of putting the hand that offered it on one side, and uttering a peculiarly mournful cry, was painfully touching." He records of this specimen, that when bled he did not exhibit the least uneasiness or alarm, but put out his forefinger to touch the blood that was

* "Magazine of Natural History," v. 309.

trickling from his arm. He was scolded once or twice for attempting to remove a blister on his chest, which the patient creature afterwards allowed to remain.

This specimen was in the habit of using a glass in drinking, and it invariably either gave it back or set it down in the most careful manner.

The Chimpanzee, though by nature and by circumstances a "total abstainer" in his native woods, is very fond of spirits or wine in a captive state. A specimen lately brought to this country was left by the captain of the ship in a cabin with two decanters of wine on the table. When the captain returned, he was astonished to find that the African stranger had swallowed all the generous beverage. Unlike the human species, who, in such circumstances, would generally have become boisterous and noisy, the poor Chimpanzee, ill at ease, went quietly to its couch and there remained till it had slept off the effects of intoxication.

We cannot conclude better than by making one or two extracts from a paper* by the now veteran wanderer in Demerara, on a Chimpanzee which, in November of this year, was exhibited in Wombwell's menagerie. Mr. Watterton was glad to pay "four long visits to this harmless little ape of Africa's sunny regions," during her stay among the Yorkshire fashionables at Scarborough. "Jenny" seemed to be very fond of celery, a luxury which reminded her perhaps of the sapid taste of some of the rare vegetable wonders of her native soil. A piece of this was held to her from the opposite side of the room, so that Jenny had to progress to it over the floor; "bending forwards in the attitude of an old man, who uses two short sticks to support his tottering frame, Jenny moved slowly, and evidently painfully, across the floor with her fore-feet clenched. On

* We are indebted for this paper to Dr. Gray of the British Museum. It appeared in a Yorkshire newspaper for Nov. 1855.

getting hold of the celery, she placed herself on her hams with visible delight; and her fore-feet being now disengaged from their embarrassment on the floor, she used them just as we ourselves would use our hands and arms.” The more Mr. Waterton observed the ape when on the floor, the more convinced he was that it was never intended to walk on the soles of its fore-feet; and he was fully satisfied, “that when this Chimpanzee is at large in its own country, all its days and nights, from birth to death, are spent aloft in the ever-verdant trees of the forest.” We could willingly quote further from this last essay of the venerable naturalist of Walton Hall, but we must be satisfied with one more extract; the allusion in the end is very characteristic of the author of the “Wanderings in South America.”

“I happened to be amongst the crowd of spectators outside the room, when Jenny was exhibited at the portal, for the last time, to the liberal inhabitants of Scarborough. Having mounted the steps which led up to the room, in order that I might bid her farewell, Jenny put her arms round my neck,—then looked wistfully at me;—and we both exchanged soft kisses, to the surprise of the lookers-on.

“‘Adieu, poor little captive!’ said I; ‘I fear that this cold and gloomy climate will be too much for thee, and will tend to shorten thy days!’ Jenny shook her head, as much as to say, ‘There is nothing here that suits me. The room is too hot,—my clothing, which they force me to wear, is quite insupportable;—and the food, which they give me, is not like that on which I fed ere I was kidnapped in my native woods.’ With this we parted; probably for ever.

“Should poor Jenny cease to live, and should her remains reach Walton Hall, I assured the guardian, that I would spare no pains to make her little favourite appear, for ages yet to come, as though the cruel dart of death had never laid her low.”

A. W.

SCENES IN HISPANIOLA.

VII. THE CACIQUE.

NOT the slightest sign of any deviation from the bridle-path through the forest could be detected, where Gomez told his companion they must leave the road. The rank fern spread its arching tracery in one continuous bed along the wayside; and brilliant *paschas*, or passion-flowers, of several kinds, were trailing among the herbage in wild luxuriance; neither the one nor the other showing in flower or leaf that human foot ever trod upon them to make a side-path into the forest. On one hand an unusually large wild pine springing from the naked trunk of a *higueron* threw its gorgeous flower-spike of scarlet and purple half-way over the road; and immediately opposite this object two tall bushes grew side by side, whose dense foliage so intermingled that they seemed but one shrub. The planter, however, stepping across the herbage, separated the bushes with his hands, and disclosed a narrow lane through the otherwise tangled and impervious forest, just passable for one at a time on foot. For more than two miles they pursued the track, which sometimes became almost imperceptible, and at length opened into a little glen in the very bosom of the tall and sombre woods.

It was such a retreat as one who had become weary of the world, a "deer wounded by the hunters," would wish to find; such "a lodge in the vast wilderness," environed by the "boundless contiguity of shade," as our own poet of nature has sighed for. It seemed the abode of perpetual peace, delight, and plenty; yet it held that

which made the feeling heart sick—the last, feeble, dying remnant of a murdered nation.

At the upper end of the valley, the rocks rose around in walls and terraced ledges, like the bastions of a frowning fortress; but on every other side, the only boundary was the dense array of lofty trees clad in their ever-fresh and beautiful verdure that covered the steep slopes. From a fissure in one of the rocks a stream was bubbling, delightfully clear and cold, which then ran off in a tiny rivulet, brawling over pebbles, and breaking in miniature cascades down the valley. Trees, fragrant with blossom, around which thousands of bright-winged insects were fluttering in the sun, or loaded with fruit of many kinds, the golden *marañon*, the huge prickly *guanabana*, the rough but luscious *nispero*, the starry *caymito*, the prolific *banana*, the *sapota* with pulp like the marmalade of quinces, were scattered on either side of the stream; and the juicy *granadillas* of many kinds threw their tendrils over the sturdy trunks, making bowers and wild arbours in which the sun twinkled through the dancing leaves.

Signs of human industry were conspicuous, for the valley was almost wholly under cultivation, simple and rude as it was. There were the broad-leaved yuca plants in neat and well-kept rows, patches of maize in full ear, tiny fields of yam and batatas, a sort of lupine, and bushes of the favourite *agi*, or scarlet pepper. The indispensable tobacco, since dispersed over the whole world, displayed its large leaves and tubular pink blossoms; and there were lines of *añil*, with its racemes of purple flowers, affording the simple cultivators a blue dye for the cotton cloth, which they wove from the snowy tufts that hung from many a shrub.

A few huts were seen scattered among the trees; but quietness and solitude almost painful reigned everywhere. No children were playing in merriment or chasing the great

butterflies that flapped lazily over the flowers; no song of peaceful joy issued from the bowers, nor even the sound of a human voice. There would have been absolute silence but for the mingled warbling of birds, and the incessant crinkling of the *cicadas* that sat among the sunny branches.

Beneath a lofty and majestic *cahobo* tree at the head of the glen, close to the fountain, was the hut of Guiboa the cacique. It was a simple but neat structure, made of young stems of the *palma real*, intertwined with branches of the same, and lined with sheaths of *jagua*, fastened by the supple and twine-like *bejuco*. It was circular in form, with a high conical roof, neatly thatched with palm-leaves.

The cacique and his wife were both at the door of their sylvan pavilion; the one trimming his arrows, and dipping their points into a calabash of the poisonous *manzanillo* juice; the other grinding down a huge *yuca* root on a rough stone, for the making of *cassaba*. They were squatted on their heels, but on the approach of the strangers the man started to his feet with a low guttural "Quah!" and stood bolt upright, gazing on them with an expression of doubt and apprehension. But Gomez stepped forward with a smile, and in a few brief words made the Indian understand that their visit was friendly.

With native politeness, the politeness of a kindly and gentle disposition, he invited the visitors, by a wave of his hand that would not have dishonoured a prince, to enter his tent. Meanwhile the lady, little burdened with clothing, but graced with retiring modesty, quickly spread before them such fare as she possessed,—the ripe, sweet fruits, the thin cakes of *cassaba*, fresh from the heated stone on which they had been baking, and presented on the large, stiff leaves of the glossy *caymito*, with cold and sparkling water in calabashes.

The Spanish hidalgo, who had been familiar with the

proudest court in Europe, looked round with unfeigned interest on the interior of the dwelling of this Indian prince. Everything was scrupulously clean, but there was little of furniture; low seats carved out of single blocks of wood; two *hamacs*, or shallow nets of cotton suspended from the posts, in which they reposed; several large balls of cotton-yarn; two or three hideous images; and a wooden mask ingeniously carved and painted, and beautifully adorned with the scale-like feathers of humming-birds, fastened on with native gum, and arranged in vividly coloured lines and patterns as brilliant as gems. These, with the frugal provisions, formed the whole of their in-doors property.

The Indians were grave and taciturn: the man possessed a slight stock of broken Spanish grafted upon his own barbarous tongue, which enabled him, by the aid of the natural and common language of eye and hand, to comprehend what was said to him by the Creole planter, who wished to show his young friend the Indian method of hunting the *iguana*. Very readily the cacique agreed to go with them for this purpose, and little delay sufficed for his preparations. He took with him his palm-wood bow and arrows, and a Spanish knife stuck in his belt, and strode on before.

A grateful smile lighted up his apathetic face, when, on coming to the road where the horses had been left, he noticed the considerate regard which had induced his visitors to avoid bruising the herbage at the entrance of his woodland path. The very existence of the Indian village was known to few of the colonists, for the district itself was lonely and seldom visited; it lay out of the ordinary beaten track, and was with difficulty accessible. The cruelties which had almost exterminated the native race were indeed no longer practised; nor had the existing generation shown any disposition to renew them; but the blight had gone

forth, and quickly and steadily the feeble remnant was dwindling to utter extermination. The remembrance of the past lay heavy on the hearts of the injured race, and what wonder that the traditions of their unparalleled wrongs made them distrustful of the white man?

Silent but not morose, Guiboa went on; now, as they passed through open glades, running swiftly, so as easily to keep pace with the ambling beasts; now creeping circumspectly, and glancing on every side where his quick senses told him game might lurk. Several times his unerring arrow had sped, and an *utia*, and two or three of the large forest doves, were already hanging at his belt. At length they arrived at a pool in a shaded dell, where the diminished water had left a wide margin of mud, partly cracked and baked by the sun, but soft and wet at the very edge of the tepid water. At this edge were congregated some scores of large and gorgeously coloured butterflies sucking the moisture; they rested on the mud, with their tall wings erected, crowded together like a fleet of yachts on a regatta day, rocking from side to side, or alternately opening and closing their magnificent pinions.

As the party approached, the whole flock rose on the wing, and danced and fluttered about, making the air of the little glade gay with their beauty. Gomez called the cacique, and pointing to the lovely creatures, asked him if he could catch some of them. He smiled assent, and laying down his ammunition and game, searched for a few minutes in the woods.

His quick and trained eye soon detected a young *lagetta* tree, the bark of which he cut through in two rings, some half-yard apart. Then, by a longitudinal slit, and by the help of his knife-point, he took off the cylinder of bark, from the inner surface of which he readily separated a thin stratum; this, when pulled open, presented a loose, fibrous

texture, hardly to be distinguished from manufactured lace. This he spread in the sun to dry, while he cut a slender sapling, and a shoot of bamboo. The latter he split; and taking a strip, bent it into a ring, which, with a few fibres from the leaves of the fan-palm, he bound to the end of the stick; here there was a ring and a handle. Then, with the palm-fibres, and a tuna-spine for a needle, all of which he found within a few yards, he ran together the lace, and sewing it round the ring of bamboo, formed as good a butterfly-net as could be desired. The whole process had not occupied above a quarter of an hour; and soon half-a-dozen of the splendid butterflies were seen and admired at leisure.

It was evident that this was not the first time that the Indian had made such a net as this; and, presently coming up to Gomez, and pointing to a brilliant humming-bird that was darting like a meteor from flower to flower, he uttered with emphasis its native name, *guainumba*.

“*Si, Guiboa,*” said the planter, “catch us a *guainumba* by all means.”

The tiny bird had inserted its spangled head into one of the fine flowers of a low *majaguo* tree; when the cacique, cautiously stealing up, made a sudden dash with the implement, snapping the flower with the stroke, and burying it, with the fluttering, frightened, little jewelled bird in the bag of the net. It was the first that Don Carlos had handled in its living wildness, and he looked with admiration on the rich metallic hues and lustrous gleams that flashed from its scaly plumes. When it was dismissed, the Indian killed it by the pressure of his thumb, and hung it with the other birds at his girdle, to afford further employment for the delicate fingers of his wife.

This little delay being passed, they soon arrived at the region which the iguana delights to haunt. It was a

dry, sterile district, full of honeycombed limestone rocks, in which the vegetation was most peculiar. Great succulent plants were springing from the stony soil, and even from the cavities of the rotten rock. Thick, fleshy-leaved aloes; the great *maguey* or *agave*, with its tall, candelabra-like flower-stem; *tunas*, and other cacti, were abundant. Many aromatic and resinous trees, mostly gnarled and spinous, with scanty foliage, the *acacia*, the *inga*, and the blue-flowered *guaiaco*, with the prickly *mayal*, and many balmy mallows and other balsamic shrubs, gave a character to this region which sufficiently distinguished it from others.

A herd of wild goats that had been feeding on the aromatic foliage scampered into the woods at sight of the party; and hundreds of lizards of several species were seen basking and glittering on the sunny rocks, or rustled among the dry leaves and twigs on every side.

Here, then, the Indian began to search for the iguana, by carefully examining the forks of the trees. Nor was it long before he saw one on the horizontal limb of an *inga*, peeping round the trunk at the intruder. The hunter had torn off, and cast away the ring and net, and had fastened to the end of his staff a noose made of a slender but tough withe. He held this out before him, approaching the uncouth reptile with slow and measured steps, singing all the while a monotonous chant in a shrill key. The others looked on with interest, especially Don Carlos, who had never seen a lizard of this size before. The animal was about two ells in length, with an enormous dewlap under the throat, the edge of which as well as the back, was armed with a stiff ridge, and cut into spinous teeth like a saw. The reptile was crouched lengthwise on the branch, with its head resting on the bark; and it did not move, apparently being absorbed by the Indian's song.

The latter presented his noose to the muzzle of the

iguana ; but as the creature's head was in contact with the branch, he gave it a slight tap with a switch which he held in his left hand ; the head rose at the touch, and the noose slid over the neck, the creature manifesting no more recognition of the action than a glance of the eye as the withe slipped by. In a moment the music ceased, and with a sudden, rapid jerk the iguana was whisked from the tree, and hung dangling in great wrath at the end of the staff. The saw-toothed tail was whisked viciously from side to side, and the enraged animal vainly strove to seize the withe in its teeth, but one or two well-aimed blows on the head quelled its fury, and it soon joined the group of dead game around the waist of the Indian, who now returned to his secluded valley.

The circuitous course which the friends had followed had led them to the margin of the Savanna of the Iasse river, and to the foot of the Pardave hills. Hence they were not far from the Padre's cottage, whom they overtook as he was leisurely returning home from a neighbouring village.

The adventures of the travellers were of course narrated, but nothing excited the curiosity of the priest so much as the details of the feast provided for the hog-hunters at Velasquez's *ajoupa*.

“ And so you had an olla podrida ! Yes, I have heard that they grow garlic and leeks and onions up in those cold mountains. *Ay de mi ! ay de mi !* I would I'd been with you ! Often have I tried to raise those excellent herbs in my garden ; but alas ! the hot sun burns them up to a stick. Well, ‘ Fortune favours the brave ; ’ if you had not toiled up the mountain you would not have had the olla podrida ! ”

For several weeks Don Carlos continued the guest of Señor Gomez, who devoted himself with untiring kindness to the gratification of his intelligent friend. What further scenes they visited and what other sights they saw we cannot inform the reader, for the record has not come down to us.

At length the time came that he must return. The Señor, and the Padre, who had been a pretty constant companion of the young nobleman, accompanied him for several miles on the road to St. Domingo before they would say farewell. And the unwelcome word was not uttered without sincere regret on every side.

“Adieu, worthy father! I crave your blessing on my voyage. If any word of mine at the court of His Serene Majesty, or in the ear of his illustrious eminence the Inquisitor-general, with whom I have the honour of an humble acquaintance, can serve you, be assured it shall not be lacking.”

“*Muchisimas gracias, Señor.* ‘A friend at court is better than a long purse.’ All I will say is, Do not forget *el pobre heremito* and his little bird with the scarlet cap in the caimito tree. *A Dios! A Dios! Vaya!*” he muttered, as he turned away and lifted the corner of his woollen *chaqueta* to his misty eyes, “how the dust blows!”

“And you, my kind friend! I need not say that you will live in my remembrance. To you I am indebted for making this visit one of great delight; and I shall carry back to Spain, with the information thus acquired, the sincerest gratitude and affection for the generous friend to whom it is so greatly due. May God bless you both! Farewell!”

The planter wrung his friend’s hand in silence, and they parted.

Not many months had elapsed before the same ship which brought to Señor Gomez a large package of books—a choice selection of Spanish literature—conveyed to Padre Tomaso a huge letter sealed with the arms of the Inquisitorial Office. He opened it with trembling hands, well knowing the awful nature of documents from the Holy Office; but was reassured when he read his appointment to be Prior of the Convent of San Geronimo of Borja, in place of Father Juan de Padilla, lately deceased.

Whether the Padre ever attained the scarlet hat and hose we have not heard. The latest intelligence concerning him that has reached us represented him as increasing in corpulence, with a most venerable duplicity of chin, sitting in the midst of his monks, over whom he exercised a gentle rule, and whom he delighted to entertain with glowing descriptions of the delicacies that he had enjoyed beyond seas, and especially of those prime dainties, grilled pimenta-pigeons, fricasseed iguana, and jerked pork. Yet he would sometimes add, with a significant wink, that a genuine *olla podrida* was worth them all. Φ

A SABBATH AMONG THE RUNAWAY NEGROES AT NIAGARA.

THE town of Niagara is at a considerable distance from the Falls. It lies on the British side of the river, at the point where it discharges its yet troubled and trembling waters into the great bosom of Lake Ontario. We arrived there on a Saturday at eleven o'clock. Having heard a good deal of the colony of Runaway Slaves settled in this quarter, I selected a black charioteer, who was pointed out to me as one of them, from among the cabmen waiting on the wharf; and, after seeing my companion comfortably ensconced in the interior, I mounted the box, and took my seat beside him, in order to have some talk with him by the way. He looked rather surprised, but at the same time much pleased, by this move on my part; his dark face brightened up immediately like night "revisited by the glimpses of the moon;" and, from the smart way in which he held his reins and handled his whip, it seemed as if he wished the horses to understand that his master was in good company, and that he must therefore be on his best behaviour. I did not know till afterwards how these poor coloured people are shunned and kept at a distance even by our own countrymen in Canada, and the importance which they consequently attach to the slightest notice that is taken of them by any respectable European. Their gratification, in such cases, is all the greater from the childish vanity by which they are very generally characterised, and which leads them to think that there must be something specially interesting and attractive about *themselves* before any decently-dressed white man would condescend to approach them, or to hold any familiar conversation with them. Finding my

sable friend in such excellent humour, I ventured, after putting a few general questions about the town and its inhabitants, to inquire as to the state of the coloured population. To all my queries on this subject, "Missa Gannel" (for that, he told me, with a very gracious bow and smile, was his name) gave the most satisfactory answers; and I soon discovered that he was not only minutely acquainted with the circumstances of his fellow-countrymen in that quarter, but that he was a person of some mark and influence among them. He was, in fact, a very shrewd fellow, with a degree of quickness and energy of mind far beyond what I was prepared to expect in one who had spent the best part of his life in slavery.

In the course of the drive to our friend's house, besides his own story, I gathered a good deal of information from him regarding the condition of the coloured refugees generally. From these statements, corrected and extended by further inquiries, I gathered that the coloured population of Canada amounted to between forty and forty-five thousand;* that for some years past the number of fugitive slaves had been greatly on the increase; that this was owing chiefly to the efforts of the Abolitionists in the Northern States, and to the operations of "the underground railroad." This consists of a well-concerted arrangement entered into by this party for the purpose of finding out runaway slaves who are "making tracks" for Canada, hiding them from their pursuers, helping them on from place to place, and supplying them with food and shelter by the way. Thus guided and assisted by regular relays of friends, the poor fugitives are passed along from one stage to another, until at last they reach the frontiers, and then they rush—rush,

* Since that date I find that the numbers have increased to about sixty thousand. This is partly owing to the effect of the Fugitive Slave Law driving coloured families from the Free States.

with bounding steps and beating hearts, across "the lines" which divide the American from the British territories. There they are safe; they breathe freely; the slough of slavery falls away from them like a moth-eaten garment; the spirit of liberty, which is the very spring and spirit of life to every human being, awakens within them, and they enter at once on a new state of existence.

Before we parted, I saw that Mr. Gannel had discovered my profession, for he proceeded to give me some account of the religious character and principles of the coloured people of Niagara, and ended by asking, if I should have any objection to preach to them on the evening of the following day. The interest I felt in the condition of these poor creatures being greatly enhanced by all I had heard concerning them, and having, moreover, it must be confessed, some curiosity to see a congregation entirely composed of coloured people, and these nearly all fugitive slaves, I readily agreed to Mr. Gannel's request.

By the time this was settled, we drove up to Mr. C——'s door, from whom and his family we received a very cordial welcome. After resting a while, and partaking of some refreshments, we took a walk out into the garden. It was towards the end of May, and the weather was lovely. As we stepped forth from under the shadow of the verandah into the brilliant sunshine, I was strongly reminded of Herbert's beautiful lines,—

"Sweet day, so calm, so cool, so bright,
The bridal of the earth and sky," &c.

In the course of conversation, I asked Mr. C—— if he knew anything of our driver. He said he did; that he was pretty well known in the place, and generally regarded as a steady and well-principled man. I then told him of the request he made, that I would officiate in their place of worship the next evening. "But I hope you have not con-

sented?" said my host. "Why not?" I asked. To this question Mr. C—— was not prepared or disposed to give any direct answer; but he tried to dissuade me from going to the meeting, and evidently thought that I had been entrapped into an engagement which he seemed to look upon as anything but suitable or agreeable. The truth is, that my friend had lived for some years in the States, and, though an intelligent and naturally a most benevolent man, he had imbibed that strange, but apparently irresistible and insurmountable prejudice against the coloured race which I afterwards found to be all but universal there, and existing among the population of the Free States quite as strongly, if not in some respects more so, than among the Southerners themselves. But, indeed, the Canadians are tinged not a little with the same spirit.

As we were talking together on this topic, my eye was caught by a large and beautiful lilac-tree growing within the garden wall, at one of the end corners of the house. It was then in full flower, and scenting the air all around with its delicate fragrance. Just as we were looking at it, and while I was expressing my admiration of its great size and singularly graceful appearance, a sudden gust of wind broke in among its branches, spread it wide open, and tossed it into a state of the most violent agitation. This sharp blast, in the midst of such a bright and beautiful day, struck us both with wonder. But my surprise was not a little increased when I saw Mr. C——, after taking a rapid look upwards, starting off instantly towards the other end of the garden, where the ladies were walking, shouting at the top of his voice, and calling upon them to run—to *fly*—into the house as fast as possible! By this time there was no need to explain the cause of the summons. It was already—to practised eyes, at least—visible enough, though one of the ladies, who had never seen anything of the kind before, did not

yet fully comprehend the reason there was for the urgency and excitement of Mr. C——'s manner. A cloud, "but little bigger than a man's hand," was rushing down with the wind in a very remarkable way, gathering bulk and volume as it advanced, and flinging out great black folds, which threw themselves abroad in thick, rolling masses over the face of the sky—that sky which but a few moments before looked so perfectly serene, but which now appeared grey and grim, as if silently preparing for some unexpected outbreak. And a desperate outbreak it was—a real and regular tornado! Before the ladies had time to run round by the gate, and to gain the shelter of the house, they were nearly swept off their feet by the first puffs of the hurricane—those savage puffs which look as if "rude Boreas" was absolutely gasping with the uncontrollable fierceness of his own wrath. My friend and I, having waited a little behind to watch the brewing mischief, were glad to take refuge in an outhouse, after enduring for a brief space "the pelting of the pitiless storm," and that not in a poetical, but in a very practical sense. For besides being caught, and cuffed, and flung down by the wind, in the most outrageous and ignominious fashion, we were literally *pelting* by a shower of hailstones, fully as large as plover's eggs, and as hard as pebbles. In all my boyish stone-battles (and I had my own share of them) I never remember to have received more painful and palpable hits than I did from these rattling pellets of ice.

The storm, however, passed away as speedily as it came on, but not without leaving many tokens of its fury behind it. One of these I must mention as being rather curious in its way. That evening I was brought to see a large, substantial frame-house, which was lifted bodily from its foundations, and carried off to a considerable distance from the spot where it stood. There it lay on its back, with its mouth (that is, its front door) wide open, and its eyes (that is, its windows)

set, as if in a dead swoon. Fortunately there was no one in it at the time. Having been scarcely finished, it still wanted the doors and windows; and that was how the gale got in about it, and obtained purchase enough to raise it up, and to make such a bold attempt to run away with it. There was also another of the effects of the storm which I cannot pass over, and which affected me far more sensibly than the fate of the house. When Mr. C—— and I emerged from the place to which we fled, when the hurricane drove us from the field, the first object that attracted my attention was the pretty lilac-tree already described, plucked up by the roots, and flung headforemost over the garden wall. Its graceful tresses lay crushed and soiled upon the ground, and its dying odours were perfuming those very breezes, whose ruffian violence had torn it from its parent soil, and dashed its crown of beauty in the dust! An emblem this of many things, on which, however, we have not time at present to descant.

The next day was the Sabbath. Having officiated in the fore and afternoon at two different places of worship, I felt rather fatigued by the time I arrived at the meeting-house belonging to the coloured people. I went thither alone; for our worthy host, though one of the kindest and politest of men, neither offered to go with me himself, nor to let any member of his family accompany me. I found the meeting to be entirely composed of blacks, male and female, the preponderance of numbers being greatly in favour of the former. There was not a single white face to be seen there. It was a genuine African audience, as thoroughly so as one could expect to fall in with on the banks of the Joliba, or in the heart of Timbuctoo. Among the many novel and peculiar sensations which the sight of this assemblage awakened in my mind, that which struck me first was the strange contrast between their complexions and their dresses. The women were decked out in all the colours

of the rainbow, but the tints which chiefly predominated were the most showy and shining. A large proportion of the men appeared to have a taste for white chokers, and very white they looked under their ebony chins. Viewing them from the desk (for I did not go up to the pulpit), I could hardly discern their features at all, or perceive the difference between one countenance and another. They all seemed one dark indistinguishable mass, relieved, in the case of the men, by three bright points, namely, the white of their eyes, of their teeth, and of their neckcloths; and in the case of the women, by the gaudy ribbons and gay feathers, with which, in addition to the two former, their heads were specially ornamented. Another circumstance which pressed itself upon my notice, was the restlessness,—the extreme excitableness which they displayed. This I was disposed to ascribe in a great measure to physical and constitutional causes, rather than to any want of sense or seriousness; for after the service commenced, it appeared to me very evident that there was no lack of earnest feeling about them. On the contrary, they seemed to be well acquainted with the great principles of divine truth, and to evince their appreciation of them as fully and impressively as any audience that I have ever addressed; although, at the same time, the restless and excitable spirit to which I have adverted seemed to mark them even in their most solemn moods. But it was before the service began, and while they were gathering in to the meeting, that I particularly observed it. The constant moving to and fro—the ceaseless turning and shifting in their seats—the rapid glances that were darted in all directions, and never allowed to rest above a moment on the same object—“the nods and becks and wreathed smiles” with which they noticed and saluted each other, indicated a degree of volatility such as I might have seen in a meeting of children, but which I have certainly never

witnessed in a congregation of grown-up people. And in reality, they did in this respect seem to me to be only "children of a larger growth," with minds as curious, senses as keen, and feelings as susceptible and variable, as any collection of youngsters that I have yet met with anywhere. I saw, however, no appearance of levity among them except in one single instance. It was that of three young coloured dames who kept talking and giggling the whole time the congregation was engaged in singing the hymn. And very beautifully that hymn was sung. The great body of the people joined in this part of the service with the most lively interest, and a richer concord of sounds, a more true, and hearty, and moving gush of sacred melody, I never listened to in all my life. This was the effect of genuine emotion, giving force and expression to the magnificent voices and musical ears with which nature has gifted this race in so remarkable a degree. Still, I felt that it was the fervid spirit with which they entered into the exercise which lent it the charm and power it possessed. They threw their whole hearts into their voices; and I observed many of them singing with their features working and the tears running plentifully down their faces. Besides this proof of their religious sensibility, I observed many others in the course of the service. During the first prayer, I was a good deal hampered, and more than once nearly silenced, by the vehemence of their responses. As I had not been used to such demonstrations, they rather disturbed me; but still I was pleased to observe that they were neither formal nor unreasonable sounds, but generally called forth by sentiments which indicated, as I thought, some scriptural knowledge and spiritual experience on the part of those from whom they proceeded. In the course of the exposition which followed the prayer, though I tried to be as calm and simple as possible, I was frequently interrupted by similar expressions of feeling. These were, in some cases,

so natural and touching, that I could not find it in my heart to restrain them, though I felt sadly distracted by them. At last, however, I was fairly brought to a dead stand. An old negro, sitting right in front of me, started up to his feet, and waving a Kilmarnock night-cap round his white woolly head, began shouting, "Glory! glory! glory!" at the full pitch of his voice. This, as may be supposed, had the effect of increasing the excitement of the rest of the audience, and fearing that the meeting might fall into a state of disorder, I thought it time to interpose, and to tell them that I was not accustomed to interruptions like these, and that if they did not keep quiet, I could not continue my address. It seemed, however, as if it was impossible for them to maintain their self-control altogether; for although they made rather less noise after this, they were by no means perfectly quiet, but, on the contrary, kept up a running accompaniment of groans, interjections, and exclamations, to the end of the discourse. Before the congregation was dismissed, my friend, Mr. Gannel, went up into the pulpit to read, or rather to give out, an intimation. It was to the effect that Brother So-and-so was dying, and he called upon the "brethren and sisters" there present to come together, "saints and sinners," that they might "pray him into heaven!"

From all I saw and heard of these coloured people, I felt persuaded that much could be made of them, if the "whites" would only lay aside their unworthy prejudices and mingle more familiarly with them. They have a strong desire to obtain religious instruction, and are very open to religious impressions. From some cases which came under my own notice, and others which were mentioned to me by parties on whose judgment I could rely, I was fully satisfied that "Uncle Tom's" portrait is by no means overcharged, and that under proper discipline the Blacks are capable of the highest intellectual and spiritual culture. It is true

that those who have been born and brought up in the condition of slaves, systematically excluded from Christian influences, and left without education of any kind save the bitter and debasing education of the slave-driver's lash, are apt to exhibit the traces of such training long after they have been delivered from it. It is not in a single generation or two that any class of human beings can be wholly redeemed from a state of barbarism, and from the super-added evils connected with a life of bondage. For this there is required a course of moral and physical discipline, extending over *several* generations, till the wild blood is, as as it were, cooled down, and the excessive predominance of the senses tempered by a fuller and firmer development of the reasoning powers. The great bulk of those who composed our audience on this occasion were without any training of this kind. They had but recently escaped from thralldom, and yet it was almost surprising to think of the amount of honesty, good feeling, and good principle by which they were characterised. If they had some of the weaknesses, they had also many of the more amiable qualities, of children. They were simple, docile, and tender-hearted to a degree; and besides this, they were,—what children in general are not,—patient under harsh treatment, grateful for any kindness that might be shown to them, and faithful to those who trusted them. The coloured race are essentially a good-tempered race. We know of no other body of men who have less gall in their composition, or who can be more easily led to do what is right. From all the headstrong propensities and vindictive passions peculiar to uneducated and semi-barbarous tribes, they are comparatively free; and it is a fact, not less remarkable in itself than it is creditable to this particular colony at Niagara, that the convictions for crime among them were rather below than above the ordinary average among the rest of the population.

FRA PAULO SARPI.

THIS bold monk, whom Bossuet used to call a Protestant in a friar's cowl, was born at Venice in 1552. His father was a merchant, who, dying a few years after his marriage, left his family in embarrassed circumstances. His mother, a woman belonging to the middle class, had a brother, a priest, who undertook the charge of one of the children, in whom he had remarked indications of great talent.

At thirteen years of age, Peter Sarpi entered the monastic order of the *Serviti*, so called from having originally assumed the title of "Serfs of Mary." According to monastic custom, he changed his name, and was afterwards known only as Fra Paulo. At an early age he had shown extraordinary eagerness in the pursuit of knowledge; and this, aided by his vivacity, wit, quickness of comprehension, and retentive memory, soon enabled him to make considerable progress in science and literature. At eighteen, he was appointed private chaplain to the Duke of Mantua, and at the same time taught theology in the Cathedral of that town. At twenty-three, he was at Milan, where he became the intimate friend of Saint Charles Borromeo; at twenty-five, he was Professor of Philosophy in his native town, Venice; at twenty-seven, Provincial Director, and at thirty-two, General Director, of the order to which he belonged. He cultivated Latin, Greek, Hebrew, and the mathematics; made considerable progress in the physical sciences, astronomy, and anatomy; and is considered one of the most elegant writers of his native language.

At this period, the Spanish domination, united to the ecclesiastical power, combined to quench every spark of intellectual life in Italy, even as Austria does at the present time. The court of Rome was suspicious of great talent;

the Inquisition persecuted every new idea, every new discovery, every new book, for fear heresy might arise. No one could discuss without being accused of impiety; no one could study philosophy without being called an atheist and a sorcerer. Giordano Bruno, Thomas Campanella, Galileo, and many less illustrious sufferers, afford an example of what the learned had to fear from the dark fanaticism of the time. From this it will be easily understood that a friar, entirely at the mercy of the ecclesiastical hierarchy, was compelled to be more than usually circumspect, and even to conceal the progress he had made in science; hence, the great results of Sarpi's studies are but little known. Few of his works have been published; some are still in manuscript; while a great part has been destroyed by his enemies, or lost; so that it is only by the united testimony of his contemporaries that we gain some idea of the value of his studies.

He anticipated Harvey in discovering the circulation of the blood, and Gilbert in explaining the magnetical phenomena, that is to say, the declination and variation of the magnetic needle. He corrected Viète, the great French algebraist; and, passing from algebra to physical and astronomical science, he emulated Galileo, of whom he became the intimate friend: it is even asserted, that he communicated to the Tuscan genius many ideas which ultimately led to his greatest discoveries in philosophy and physics. This is probable, for we find that Galileo, in his correspondence, calls him his Father and Teacher.

It was not, however, through these studies that Sarpi's name has been transmitted to posterity. His works on history, his doctrines as a deep thinker, his ideas on civil, political, and ecclesiastical matters; his firm, consistent, and indomitable character as a public man; and, more than all, his courage in fighting alone against the gigantic power of Rome, entitle him to our respect. At that period, the aspi-

rations of the Papacy to universal dominion above emperors, kings, and republics, were unchecked; it was therefore no easy matter for a nation to resist the power of Rome. Although Naples, Sicily, Parma, Lucca, Florence, Mantua, Milan, Genoa, and Savoy, as well as France, Spain, and Austria, had occasionally struggled for religious emancipation, they were still enslaved by the ecclesiastical authority of Rome. Venice, that powerful republic which had for centuries ruled the greater part of Eastern Europe, felt, however, but little disposed to flatter Papal caprice, and, therefore, employed as councillor in religious matters no less a person than Fra Paulo himself.

The question of jurisdiction between the State and the Church had long been a subject of dispute between Rome and Venice. During one of these altercations, while Leonardo Donato, the Venetian ambassador at Rome, was conversing with the Cardinal Borghesi on the subject of his mission, the Cardinal suddenly exclaimed, "If I were Pope I would excommunicate you;" to which Donato replied, "If I were the Doge I should laugh at your excommunication." In the following year, a new Pope, Paul V., was elected. He excommunicated the dying Doge Grimani, the Senate, and the Council of the Republic; and went so far as to order that no other Doge should be elected until concessions had been made to the Church. The Senate, however, filled the vacant office according to custom; and it so happened, that Leonardo Donato was the new Doge of Venice, and the Cardinal Borghesi the new Pope of Rome.

In the year 1605, Venice, determined to prevent a further assembling of priests and monks in the limits of the republic, enforced a law which had been enacted as far back as 1357, which prohibited, under pains of exile and confiscation, the establishment of new churches, convents, or monastic orders. In the same year, a law, passed in 1333,

was renewed, forbidding the clergy throughout the Venetian dominions to acquire landed property. The Pope peremptorily demanded that the Republic should abrogate these laws within twenty-four hours, or excommunication and interdiction should follow *ipso facto*. In this dilemma, the Senate requested Fra Paulo to write a memorial in answer to the question, "What will be the best means of averting the thunderbolt of Rome?" Instead of a memorial, the monk simply wrote these few words, "Pacific arrangements, if possible; if not, determined resistance."

The Senate followed his advice, and as the Pope refused to come to any arrangement, the latter course was adopted. Fra Paulo was engaged by the Republic to persuade the priests, monks, and people, of the righteousness of her decision. His talents, eloquence, learning, and tact, completely triumphed over the prejudices of the people, and thus the republic was enabled to offer energetic resistance without endangering public tranquillity. The bishops were ordered to discontinue all relations with Rome, and to give up to the Senate any letters they might receive from the Pope. The Pope then commanded all pious people to leave the Venetian States; but the republic declared, "Whoever attempts to leave Venice shall be hanged." Many monks and priests joined in the movement, but the Jesuits resisted, and even attempted to organise a conspiracy among the monastic orders to overthrow the authority of the republic. This plot having been discovered, they were expelled; and this is, perhaps, one of the most celebrated of their numerous expulsions. So completely had Fra Paulo convinced the people of their villany, that it required all the troops in Venice to protect them from the fury of the people.

This event influenced the literature of the period in Italy, Spain, France, and Germany. The contest raged with the greatest animosity on both sides. All the invectives of the priest party were, however, directed against Fra Paulo, who

was regarded as the leader of the movement. He was designated as the "head of a generation of vipers, an ignorant, an infidel, a Lutheran, a heretic," &c. ; but when his treatise on the interdict appeared, the indignation of Rome knew no bounds. This and his other works were publicly burned ; and, probably with the intention of burning the author also, Sarpi was summoned to appear within twenty-four days before the awful tribunal of the Inquisition. Bellarmine, the celebrated apologist of regicide, wrote to him in the Pope's name, " You have maintained that the republic of St. Mark is right, and that the successor of St. Peter is wrong ; you are therefore a heretic." Fra Paulo did not go to Rome, and the Pope and Inquisitors dared not insist ; " Because," as Sarpi's historian says, " they feared he would do in Italy as Luther had done in Germany, for they remembered that the Augustine monk went to extremities when Leo X. had condemned him."

Towards the middle of 1606, the Pope was compelled to withdraw his pretensions, and the Papal maxim, " Bold with the weak, humble with the strong," was once more reluctantly put in practice. This timely concession doubtless saved him, but he never forgot that the see of Rome owed her humiliation to a friar's opposition. When threats were found of no avail, recourse was had to promises ; power and honours were freely offered, and false friends urged him to go to Rome, but he knew his adversaries too well to listen to their seductions. One day his trusty friend, Trajano Bonalini, who lived at Rome, wrote to him, " You must bear in mind that you have offended by words, by writing, and by deeds, a Pope, a college of Cardinals, a court of Rome, an Apostolic see ; and if they forgive you, I shall expect to see Turks accept the Gospel. The arm of the Roman priest is long, it enters everywhere, and it strikes before its presence is known." The courageous friar, however, did not heed this warning ; and in 1607 (scarcely a year after the

contest), while walking with a Venetian noble in a solitary street of Venice, he was knocked down, stabbed in several places, and the point of the knife left broken in one of his wounds.

The popular feeling excited by this event made Venice, according to the testimony of contemporaneous writers, appear as though some universal calamity had taken place. The general indignation against the suspected adherents of Rome was so great, that archbishops, bishops, and canons, justly fearing an outbreak of the people, fortified their houses. The friar's life was long in danger, and, had he died, he would doubtless have been avenged. He fortunately recovered, and although his life was again attempted by the assassins of the Roman court, he again escaped her malice. In the midst of danger his wit seldom forsook him. "I have never seen so strange a wound," said the surgeon who was endeavouring to cure the most dangerous; "Yet," observed Fra Paulo, "people say it has been given *Stylo Romanæ Curie*."

These misfortunes did not cause him to abandon his mission, and if we may judge by the ferocious hatred displayed by the Papal hierarchy, the injury he had done them must have been very great. A proof of the clerical animus is shown by the fact that two of Sarpi's friends, John Marsilio and Fra Fulgenzio, having gone to Rome, the first was poisoned, and the latter thrown into the prison of the Inquisition where he died. The power of Rome at this period may be better understood when we remember that it was in 1610 that Henri IV., of France, fell under the dagger of Ravailiac.

Space will not permit us to enter into the details of the eventful life of Fra Paulo.* We must not, however, fail to

* A. Bianchi Giovini has published at Turin a most careful biography of Fra Paulo.

mention, that the work which rendered his name universally known throughout Europe was his "History of the Tridentine Council, in which are discussed all the artifices employed by the court of Rome, to prevent that either the truth of her dogmas be known, or the reformation of the Papacy be effected. By *Pietro Soave Palano*," (anagram of Paolo Sarpi Veneto). This book acquired extraordinary celebrity, especially in this country, where it was dedicated to King James I. This edition, in Italian, was first published in England in 1619, by Marc Antonio de Dominis, ex-Archbishop of Spolatro, who, in his episcopal robes had in 1617 publicly abjured Catholicism in St. Paul's Cathedral. These facts, added to the stern and deep reasoning of the book, and the author's great learning, excited general curiosity, and in the following year the work was published in Latin, French, English, and German. Till then the Council of Trent was as unknown to the men of that epoch as any of the modern diplomatic mysteries are in our day. Fra Paulo was much annoyed that the Archbishop de Dominis had published his manuscript, which he had neither dedicated to James I., nor authorised to be made public. The modesty of the Venetian friar has been incontestably proved by the unanimous voice of his contemporaries; while de Dominis is known as an unscrupulous man, who made extracts from papers which Sarpi had lent him, and then published them without the author's sanction. It is probable that the work was unfinished, and that Sarpi had intended to publish it when he thought an effect might be produced in Italy favourable to some grand object he had in view. Whatever his idea may have been, it failed through the premature haste of a man who had the inconsistency to be reconverted to Catholicism, and who having returned to Rome in the hope of obtaining greater honours and wealth than he enjoyed in England, suffered an ignominious death in the Castle of St. Angelo.

Serious discussions arose in after years among the learned, as to whether Fra Paulo thought of introducing into Italy the doctrines of Calvin, Luther, or John Huss, or some new doctrine. The fact of his having been the intimate friend of Sir Henry Wotton, the English ambassador at Venice from 1604 to 1610, and of his chaplain, William Bedell (afterwards Bishop of Kilmore), whom he had requested to translate the Anglican Liturgy, led his adversaries to accuse him of Protestantism; but as he procured translations of every Protestant book in the English, German, and even Bohemian languages, it is probable that he simply wished to know the progress of the religious question in the various countries of Europe. It, however, seems evident that he neither thought of founding a new sect, nor of joining any of those already in existence, but rather to effect a thorough reformation within the Papacy.

Whatever may have been the plans he had in his mind, that which he accomplished is sufficient to place him among the greatest men of his time. In an age of prejudice, superstition, persecution, and universal religious fanaticism, he boldly asserted the right of the State to be independent of the Church, denounced the encroachments of Rome in assuming temporal power, exposed the iniquity of the Popes in having falsified the dogmas of religion, showed the injustice and tyranny of the clergy and their ecclesiastical councils, dissipated that infatuation which made the people of Italy believe in the spiritual power and infallibility of the Pope; and during his whole life carried on a struggle against the Papal See, without raising the prejudices of the people, and thus prepared the way to that gradual revolution which has already undermined the prerogatives of the Popes, and morally destroyed the supremacy of Rome. E. F.

LEAVES FROM THE LINDEN GROVES.

GERMAN LAYS TRANSLATED.

THE HEART OF MAN.

THE heart of man is like the flower
That blooms upon the grassy glade ;
To-day in glory bright and pure,
To-morrow it may droop and fade.

The flowers, I think they once were stars,
And sparkled with celestial light :
That's why the blossoms mourn and weep
When stars begem the summer night.

Dropt from its shining place on high,
Man's heart is now a fallen star ;
And tearful is the gaze that eyes
Its vacant home in heav'n afar.

BIGGS.

THE BELL IN THE HEART.

(IMITATED.)

Thine heart beats quick the livelong day ;
What can it mean ? what does it say ?
It beats, my child, the dark night through ;
What says that throbbing heart to you ?
A quiet bell, with gentle tone,
The good God gave thee for thine own :
It hangs upon thy spirit's door,
And Jesus rings it more and more ;
And waiting still without He stays,
And for an entrance kindly prays ;
And louder rings thine ear to win,
And longs thou 'lt cry, " Come in, come in."

So beats thy heart day after day,
 Till its last pulse hath pass'd away.
 In that last pulse it slowly rang
 At Heaven's gate with solemn clang ;
 And leaves thy spirit waiting there
 An answer to its final prayer.—

Christ says, " Come in, a welcome guest,
 I found with thee a pious rest.
 As thou lov'dst me, so loved I thee :
 Come, thy dear Saviour's face to see.
 Welcome to Heaven's eternal rest,
 Thou dearly loved and richly blest !"

SCHEURLIN.

ON THE SEA-SHORE.

There gazes on his swelling bales
 The merchant with delight ;
 Here a poor fisher almost fails
 His broken nets to right.

The sunshine there, and storm-clouds here,
 There silence, and here song ;
 There glad return, here parting's tear,
 And the last gaze so long.

Two girls are seated on the strand :
 One weeps as o'er a grave ;
 The other from her gentle hand
 Throws roses o'er the wave.

The one, Woe's sorrow-breathing child,
 Groans 'mid her inward strife,
 " O sea, O sea, so dark and wild,
 Thou 'rt like, so like my life !"

The other, Joy's light merry child,
 Knows nought of pain or strife;
 She smiles, "O sea, so soft and mild,
 Thou 'rt like, just like my life!"

The sea flows on, it seemeth loth
 To heed or song or prayers;
 The sea flows on, engulfing both
 The roses and the tears!

GRÜN.

NIGHT AT SEA.

The night is still and clear,
 The land is far,—how far!
 High, softly as in fear,
 Steals ev'ry glitt'ring star.

It seems to me, O God,
 As o'er the waters cold,
 My Jesus glorious trod,
 As once in days of old.

And oh! to sink I'm fain,
 Deep in the stilly sea,
 If so, I could but gain
 One nearer gaze on Thee.

To see Thy face, dear Lord,
 Is all my longing's sum;
 O speak the bidding word:
 "I come, my God, I come."

W.

HERDER'S PARABLES.

JOHN G. VON HERDER was born at Mohrungen, in East Prussia, 25th August, 1744 ; son of a poor schoolmaster there, whose narrow views blew rather gruff and cold on the budding genius of the young poet. Led by an interesting, not always smooth path, he got to the University of Königsberg, where, under Kant and others, he lived in the constant intoxication of philosophic and theological study. After being this and that, he was called as court preacher, superintendent, &c. to Bückeberg (1770), where he remained six years, high in the friendship of Count William of Lippe-Schaumburg. From thence he went to exercise the same office at Weimar, in whose noble society—when Göethe, and Schiller, and Wieland, were there—he remained, himself a star of high magnitude and clear shining, till the time of his death (18th December, 1803). A man of constant activity, and of high philosophic and literary attainment, he hath achieved for himself one of the highest names among the Walhalla heroes of the German literature! In the faith his name is not so high. The deep mysteries thereof are to his eye not near so clearly manifested as to many whose names stand written in no book of earthly fame, written only in that great, unspeakable, ineffaceable book, which Jehovah Himself hath written. Yet of Herder, too, we trust that though dim, not bright, his perception of the Everlasting Light was true. In his parables you are not to expect, therefore, so much spirituality of tone and temper, but little fanciful legends rather and lively sketches—the shining sparks from a glowing imagination, throwing light on the place and duty of man in the world mainly. Some lesson in Christian morality is generally the object of his teaching, parabolic or other.

THE STRIFE OF THE HOLY HILLS.

When God descended on Sinai to give the law, the Spirits of the Mountains in the Land of Promise appeared before Him: "Wherefore," said they, "dost Thou despise us, the chosen ones, and select a foreign mount—a barren rock in the heathen waste—for the stool where Thy feet may stand?"

"Who are ye," spake Jehovah, "that ye should venture to become the footstool of my glory? Look around. My step was there, on yonder sunken mountains, on the now ruined hills of the old time; where is now the crown of their summits?"

"But upon you," continued the All-Gracious, "I will manifest my glory in milder form: Thou, smiling Tabor, shalt look upon the face of my Son, and hear my gentler voice in Him. Thou, Mount of God, thou, fruitful Carmel; on thee shall my servant Elias dwell, and with fire from heaven shall make known my name to men. Thou, Lebanon, shalt build my sanctuary; and thou, modest and silent Zion, upon thee, the smallest of the mountains, shall that sanctuary rest,—the everlasting habitation of my Name. The Mount, where the house of Jehovah is, shall be higher than all the mountains of Earth, and shall be exalted above the hills."

Joyfully the Mountains left the presence of Jehovah: they envied Sinai no more; and the smallest of all, the lowly Zion, became in the future the greatest among the Mountains.

THE SUN AND MOON.

Daughter of Beauty, beware of Envy! Envy has thrown angels out of heaven: it hath darkened the beautiful Moon, the graceful form that adorns the night.

The creating voice went forth from the council of the

Eternal : "Let two lights shine in the firmament as rulers to determine the passing time."

He spake, and it was so. The Sun, the first light, arose. As the bridegroom in the morning steps forth from his chamber, as the hero rejoices in the path of victory, so stood he, clad in his heavenly brilliancy. A garland of every colour enringed his head, the earth shouted for joy, the herbs sent forth their pleasant odour, the flowers adorned themselves right gaily.

And the other light stood full of envy, and saw how it could not surpass the glorious one in splendour. "What should two princes," it said, "do upon one throne? Why am I the second, and not the first?"

And suddenly, chased away by that inward grudge, its beautiful light vanished. Far away did it fly into the air, and was changed into the glorious host of stars.

Pale as one dead stood Luna there, confounded before all the heavenly ones, and wept. "Have pity on me, O Father of all," she cried; "have pity on me."

And the angel of God stood before the darkened one; he spake to her the words of holy destiny. "Oh, Unfortunate, because thou hast envied the light of the Sun, thou must from henceforth shine only from his light; and whenever yonder earth steps between thee and him, then must thou stand darkened as now, wholly or in part. But weep not, child of Error. The Compassionate has forgiven thee thy sin, and changed it into good. Go," he said, "speak comfort to the penitent one; let her, too, in her shining be a queen. The tears of her repentance shall be as balm, to refresh all that is languishing,—to quicken with new vigour that which the Sun's hot rays have made faint."

Comforted did Luna turn her away;—and behold! there fell around her that pleasant light in which yet she shimmers: she entered upon the still path, which yet she ever treads—

the Queen of Light—the leader of the stars. Weeping over her own guilt, and feeling sympathy for every tear, she seeks whom she may quicken, she seeks whom she may comfort.

Daughter of Beauty, beware of Envy. Envy has thrown angels out of heaven : it hath darkened the Moon, the fair form that adorns the night.

THE RAT IN THE IMAGE.

(*After the Chinese.*)

Hoan-Kong once asked his minister, Koang-Chong, what it was of which one needed to be most afraid in a State? Koang-Chong answered, "Prince, in my estimation there is nothing of which one ought to be more afraid than of what is called the rat in the image."

Hoan-Kong did not understand this comparison. Koang-Chong explained it to him thus:—

"You are aware, Prince, that there are erected in many places images in honour of the Genius of the place. Now, these wooden statues are invariably hollow, and outside they are painted. But a rat had made his way into one of them, and no one knew how to have him driven out. Fire they durst not make use of, lest it should kindle upon the wood of the image; and to put the statue under water would hardly do either, for fear the colours should be spoiled. And so the reverence in which they held the image was the means of covering and protecting the rat."

"And who are these rats in the State?" asked Hoan-Kong.

"People who have neither merit nor virtue," said the minister, "and who, nevertheless, enjoy the favour of the monarch. They destroy all : people see and sigh over it, but one cannot tell how to attack or get at them. *They are the rats in the image.*"

W. H.

LETTERS TO FRIENDS FAR AWAY.

December 24, 1855.

DEAR FRIENDS,—The year opened gloomily. After a boastful outset, Sir Charles Napier had in the previous autumn brought back his fleet with nothing but the meagre laurels of Bomarsund; and in the Crimea the victory of Alma had not been followed by that capture of Sebastopol which the imagination of the public had pictured as the instantaneous consequence. The fields of Balaklava and Inkermann, whilst exhibiting in British soldiers the dash of Troubadours and the nerve of old Romans, had yielded no positive advantage; and for dreary weeks and months the sympathy of an indignant nation was tortured by accounts of the privation and suffering to which heroes were subjected through the heartless routine or the horrible blunders of incompetent civil officials.

But the country was resolute. Untrammelled by the personal influences which may be felt in high circles, it only saw in Russia the enslaver of the nations—the Gorgon whose hard eye turns flesh and blood to stone. In Sebastopol it saw a “menace” to European civilisation; and it felt that the battle of London and Paris was fighting in the Baltic; and undismayed by enormous sacrifices, and undisgusted by grievous mismanagement, it demanded a vigorous prosecution of a war which it viewed as a sacred though mournful necessity.

And now things are better. Not only is South Sebastopol with its 7000 guns a possession of the Allies, but with the Russian navy annihilated in the South, there seems no immediate danger of a Mediterranean Muscovy; whilst a treaty of Norway and Sweden with the Allies promises such

security as can be given in this uncertain world against future expeditions from the sea-coast of Scandinavia.

Not only has the national will imparted energy to the government, but it has manifested its serious purpose in the payment of heavy taxes and in noble free-will offerings. A fund for the benefit of the wives and children of soldiers absent on active service now amounts to upwards of 112,000*l.*; and on the 16th of November the Patriotic Fund had risen to 1,296,282*l.*; at which period it was relieving 2544 soldiers' widows, and 3119 orphans, at an annual expenditure of 65,000*l.*

Amidst these stern realities, its Industrial Exhibition has given Paris a six-months' holiday, and England has rejoiced in royal visits. The Sovereigns of France, Belgium, Portugal, and Sardinia, and the Crown-Prince of Prussia, have all been the guests of Queen Victoria.

And in our own favoured isle we trust that the work of internal improvement has not been standing still. Fresh efforts have been made to bring Christianity into contact with the working classes; and the encouragement which attended the open-air preaching of last summer will doubtless lead to more extended services next season. In Scotland, mainly owing to the Act which closes public-houses on Sunday, the consumption of whisky has been reduced nearly a million of gallons below the yearly average; or from an average of 6,914,308 to 5,991,870. And although a formidable assault is threatened on the sanctity of our Sabbaths, it is to be hoped that a policy, at once more holy and more humane, may triumph, and that more week-day leisure conceded to the sons of industry may remove the chief pretext for Sabbath-breaking.

The year '55 is fraught with hallowed recollections in the history of English Protestantism. It was on the 16th of October, 1555, that Latimer and Ridley were burnt at

Oxford; and both there and at Latimer's birthplace, Thurstaston in Leicestershire, the tri-centenary was suitably observed. Those who have visited the tomb of "the tenth muse" at Heidelberg, may be interested to remember that it was on the 26th of October, 1555, that Olympia Morata died. And it was in 1655 that the massacre in Piedmont occurred which drew forth Milton's famous sonnet, and led to Cromwell's brave interposition on behalf of the Waldenses. How remarkable that this centenary should have seen the Sovereign of Piedmont received in England as a champion of civil and religious liberty!

Whether the great cause of human improvement has made any material progress throughout the world within the closing year, it would be hard to say. We hope it has: for although the Emperor of Austria has, in the most abject fashion, placed his dominions and his crown beneath the foot of the Popedom, Spain by the sale of its church-property, and Sardinia by the suppression of its convents, have shown that they no longer dread the spectre in the Vatican. The remarkable revival among the Armenian Christians, and the extensive circulation of the Scriptures among the French and Sardinian soldiery, and even among the Turks, show how the kingdom of peace and righteousness can spread amid scenes of bloodshed and confusion. And if the letters sent home by common soldiers, and the dying testimonies of British officers, may be accepted as an index, there is a prodigious advancement in the intelligence of the English commonalty within the present generation, and a still more cheering progress in the piety of the upper classes.

The lights that have ascended into our intellectual firmament it is not easy to enumerate; for there is a dimness in the eastern horizon with which genius has usually for awhile to struggle, and it is seldom that we can mark the

moment when a master-spirit flashes into view. It is easier to record their setting. And if few first magnitudes have disappeared, some familiar stars are missing. Archdeacon Hare is gone, the vindicator of Luther, and the learned, thoughtful author of "The Mission of the Comforter,"—a man who did much to modernise the Fathers and to naturalise German exotics on the soil of English theology; and Dr. Gilly, who worked for his Waldensian friends so faithfully, and whose "Life of Neff" has taught so many noble lessons; and Professor J. J. Blunt, who applied to the Pentateuch and the Gospels with skill, not less than Paley's, the principle of the "Horæ Paulinæ." Science has to deplore the loss of De la Beche and Greenough, the geologists; Dr. George Johnston, the enthusiastic student of marine zoology; Professor Johnston, whose charming papers had gone so far to render popular and amusing the "Chemistry of Common Life;" and the greatest of Polar voyagers, Sir Edward Parry. And the year, which began with the death of Mary Russell Mitford, closes with the exit from the scene of Samuel Rogers.

From time to time "Excelsior" has recorded the most notable publications which fell in its way. The departments in which the year has been richest are History and Poetry. Now that the twelfth volume is ready, Mr. Grote has completed his colossal "History of Greece;" and, as the result of seven years' labour, Mr. Macaulay has given us seven years of King William; Mr. Prescott has produced two volumes on Philip II. of Spain, as clear and unaffected, and almost as romantic, as any of his previous narratives; and whilst Mr. Massey has rendered the tale of last century distinct and accessible, Dr. Doran has made it diverting. And just as a loud talker or a noisy piano sets caged canaries a-singing, the cannonades of the Crimea would appear to have excited our minstrels to a perfect tempest of song. Of the many volumes we have read, those

which we have most enjoyed are, Macdonald's "Within and Without," and Longfellow's "Hiawatha." And without entering into further details, we may commend to the book-clubs of Melbourne and Montreal, and to the Mudies of Cape Town and Calcutta, such works as the following :—

Buchanan's "Faith in God and Modern Atheism;" Walker's "God Revealed in Creation and in Jesus Christ;" Young's "Christ of History;" Guthrie's "Ezekiel;" Stanley on Corinthians; Birks's "Treasures of Wisdom;" "Life of Alderman Kelly;" "Memoir of Adelaide Newton;" Muirhead's "Life and Inventions of James Watt;" Peacock's "Life of Dr. Young;" Brewster's "Life of Sir Isaac Newton;" Stanley's "Memorials of Canterbury;" Kingsley's "Glaucus;" Maurice's "Learning and Working;" Trench's "English Past and Present;" and Stirling's "Velasquez."

REVIEW OF THE MONTH.

THE close of the year has brought its usual profusion of books,—projected serials which blossom at the same time as the ivy, and autumnal lucubrations which ripen along with the holly.

The pencil of Birket Foster has found appropriate themes in Herbert's "Poems," in Goldsmith's "Traveller," and in the landscape of "The Rhine." For the latter, Henry Mayhew has furnished description and narration, lively, cheerful, and natural, whilst the engravings are exquisite; and of the former, it is enough to say that the pure gem never appeared in a lovelier setting. The truth, the brightness, and occasionally the quaintness, of "holy Herbert," appear absolutely to have overflowed into the pictures of his congenial illustrator.

To Mr. Porter we are indebted for invaluable additions to sacred topography in his "Five Years in Damascus," which must now be the standard authority as regards the regions beyond the Jordan. "God Revealed in the Process of Creation and by the Manifestation of the Lord Jesus," admirable for original and independent thought, and clear and vigorous language, is a book altogether worthy of the author of "The Philosophy of the Plan of Salvation." In "Man and his Money," Dr. Tweedie has brought a mass of impressive facts and earnest reasonings to bear on the stewardship of earthly possessions; in "The Home School," with eminent sense, directness, and warmth of affection, Mr. Norman Macleod has furnished "Hints on Home Education," for which many parents will thank him; and in his "Scripture Studies," Mr. Drew has given a masterly sketch of Old Testament history, with a conspectus of the successive contributions to the records of Inspiration made by the sacred writers. "Hints on the Culture of Character" are compiled from Croly, Villiers, Dale, and authors whose names are ample recommendation; and "The Beauty of Holiness" we should have liked much better had it not quoted so largely from the Apocrypha. "The Cripple of Antioch," and its companion stories, are a sequel to "Tales and Sketches of Christian Life" in early times, and are a wonderful reproduction of those departed days with which the writer exhibits an intimacy so minute and loving. And the "Memoir of Adelaide Newton" is a record of Scriptural piety worthy to rank beside the "Memorials of Two Sisters" and the "Life of Mary Jane Grahame."

Embellished with beautiful coloured lithographs, we have Mr. White's "Popular History of Birds," into which, like the bower-bird he describes, the writer has gathered no end of matter, rare and curious, selected from his own inexhaustible stores. In "The Wonders of Science; or, Young

Humphry Davy," Mr. Mayhew has given us the romance of the boy-philosopher; and if some fancy mingle with the facts, the book is none the less inspiring, and we doubt not it will occasion a great demand for phosphorus and burn many fingers. Mrs. Gatty's "Parables from Nature," appearing in a very unassuming guise, are exceedingly ingenious and full of playful fancy, as well as true philosophy. "Mia and Charlie" will be a favourite with our youthful readers; and, with its delicate observation, its deep sympathies, and its noble, because truly religious, sentiment, "Christian Melville" deserves to be a favourite with all.

The handsome edition of Dr. John Owen, in twenty-four volumes, is now completed, and its success is one good sign of the times. It is to be followed by a similar edition of Howe. Before us lie some of the recent publications of the Society for promoting Christian Knowledge, and the superior style in which they are executed shows that, like the Tract Society, this ancient institution is not unconscious of the march of intellect. We would specify, as beautiful examples of printing in oil-colours, a series of "Picture Reward Tickets." We know not what Mr. Longfellow thinks of our own publication; but if he is aware of all the "Excelsior" literature which has appeared on this side of the Atlantic, he must consider his own little lyric the most successful of poems. We cannot tell how often it has been set to music. We have just received an "Excelsior" Spelling-book, and an excellent series of cheap and useful volumes is making its appearance under the title of the "Excelsior Library."

On the 12th of December the foundation-stone of the Jubilee Building of the Sunday School Union was laid by Alderman Challis. It is on the site of what was once the house of Jonathan Wild. The Union has resolved on a magnificent movement on behalf of the metropolis early in the opening year. Its object is, if possible, to sweep into the Sunday School the entire juvenile population of London;

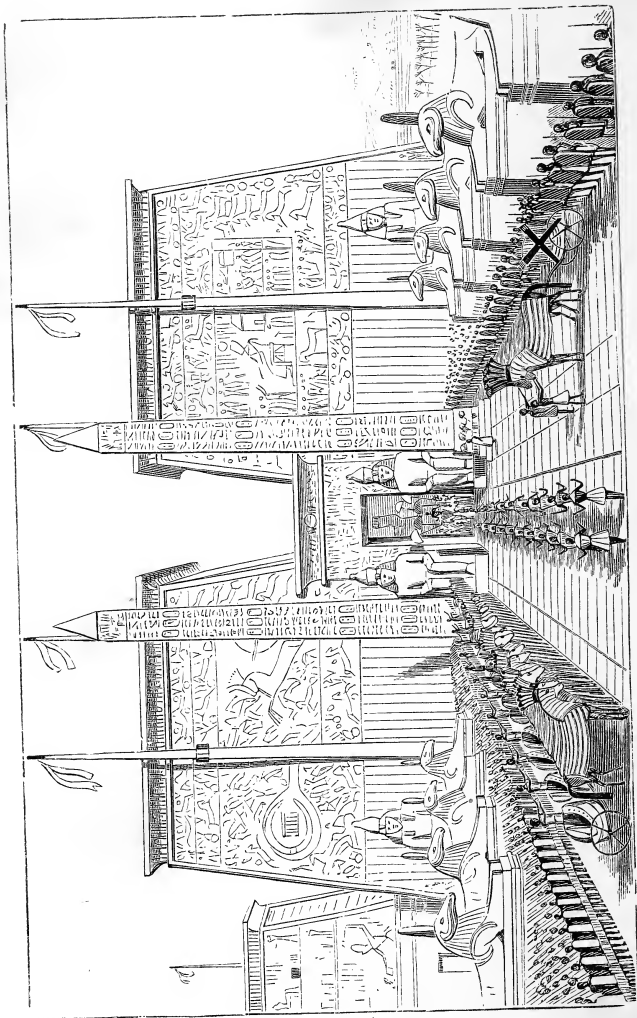
and as a preliminary step, a statistical inquiry is to be instituted by 7000 canvassers, who shall ascertain how many children are at present attending no Sunday School, and whether their parents would be willing to send them if accommodation were provided.

The present enlightened Governor at the Cape, Sir George Grey, is directing his attention to the education and civilisation of the Caffres. As a means towards this end he has offered to assist the missionaries in their educational efforts among the natives; and already several young Caffres have volunteered to become apprentices at the Lovedale Seminary, with a view to become school-masters and instructors in the mechanical arts among their countrymen.

It was on the 22d of December, 1854, that, at the age of ninety-nine, the President of Magdalen College was gathered to his fathers; and the same month of December in the expiring year has carried from our midst the patriarch of English poetry. Samuel Rogers was not so old as Dr. Routh; but it is sixty-three years since he published "The Pleasures of Memory;" and poems of his are dated as far back as 1782.

Early in the same month died the Rev. Robert Montgomery. With his very numerous publications we confess that we have but slight acquaintance. Had they been fewer, and had his taste been more severe, it would doubtless have been better for his enduring fame.

We are happy to announce that a committee has been formed with a view to collect a Scriptural Museum. Its object is to bring together, in some central locality in London, everything which can illustrate the topography, the antiquities, and the natural history of the Holy Land, or which can throw light on the study of the Word of God. The Secretary, the Rev. D. Edwards, will be happy to receive suitable contributions at the temporary office of the Society, 22 Hart Street, Bloomsbury.



View of the Propylon of Luxor.

EGYPT: ITS ARCHITECTURE, SCULPTURE, AND PAINTINGS.

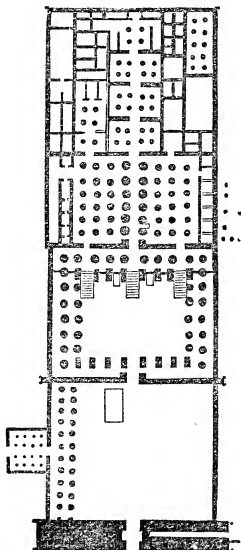
NOTWITHSTANDING the interest which attaches to Egypt as the cradle, if not the birthplace, of civilisation, any definite knowledge of its monumental records is confined to a few learned men who have made them their peculiar study, but who have not sought to popularise the results of their labours. Virtually, Ancient Egypt exists for the many but in name. They know it from Holy Writ as the Land of Bondage. They may have heard of the stupendous ruins found in the country; may have marvelled at the architecture and the sculptures, or gazed with idle curiosity at the paintings; but for any just comprehension of what they have seen, they are still in almost total darkness. Without presuming in an article like the present to supply a deficiency palpable to all, we may yet venture to explain some of the sculptures and paintings which illustrate the history of the country, or the manners and customs of the people; and, with the aid of occasional reference to examples in the British Museum and the Crystal Palace, to awaken some degree of popular attention to the treasures of information within the reach of all.

Before, however, describing the sculptures and paintings, it may be desirable to offer a brief outline of the characteristic features of the temples themselves, so far as we may be enabled to deduce them from the remains still extant.

The monuments we have left to us in Egypt are of two periods,—those built in the times of the Pharaohs, and those built during the rule of the Greek and Roman kings of the country. Although the temples of the two periods differ

materially in plan and in other particulars, there is yet sound reason for believing that those built under the Greeks and Romans were constructed after designs, and certainly occupy the sites of Pharaonic temples still more ancient than any now existing—that they were, in fact, mere restorations of temples built by the earlier Pharaohs; affording signal evidence of the respect entertained by the Greeks for Egyptian Art, since, instead of destroying its examples, if our hypothesis be correct, they rather sought to restore after the type of the originals.

Fig. 1.



Plan of the Memnonium.

The leading features of an Egyptian temple of the time of the Pharaohs are these (Fig. 1):—

First, a gateway or pylon, flanked by two truncated pyramids, occupied the entire width of the building, and formed the entrance to a square court surrounded by a portico supported by a double or single row of columns.

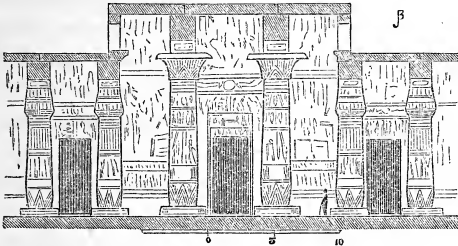
Crossing this court, the visitor passed through a second pylon into the inner court, which was likewise surrounded by a portico supported either by columns, or by piers against which were figures of the king. Beyond this second or inner court it would appear the public were not admitted, for the spaces between the front row of

columns or piers facing the gateway, were occupied by a dwarf wall which effectually barred entrance excepting at *one* or *three* points, where there were gates.

This inner court led immediately into the largest chamber

of the whole temple, called "the Hall of Columns" (Fig. 2); the roof of which was always supported by columns representing a grove of papyrus. The centre avenue was higher than

Fig. 2.



Section of Hall of Columns.

the rest of the hall, and consisted usually of twelve columns, the capitals being imitated from the full-blown expanded plant, while the columns which sustained the lower roof were in the form of the bud of the same plant.

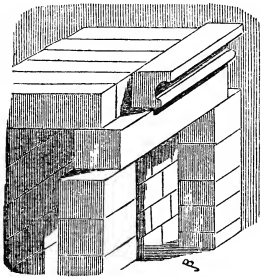
To the Hall of Columns succeeded a series of smaller chambers, the roofs of which were generally supported by six or four columns, imitating the bud of the papyrus, either as a single plant, or as representing several plants bound together; or else by single square piers, or columns with sixteen faces,—twelve, or in some cases fourteen, of which were slightly concave.

To these chambers again succeeded numerous others still smaller, the roofs supported by two columns or piers, and sometimes entirely without either the one or the other. These apartments usually surrounded a dark chamber (the Holy of Holies), the most sacred in the temple.

Whether the roof of the portico which surrounded the court was supported by piers or columns, the structural arrangements were always precisely the same. There was (Fig. 3) first the pier or column, usually made of several pieces

of stone solidly united by mortar and wooden cramps; then came the architrave or frieze, of one or two blocks, stretching from column to column; and, lastly, the carved blocks forming the cornice, concealing the ends of the roof-stones

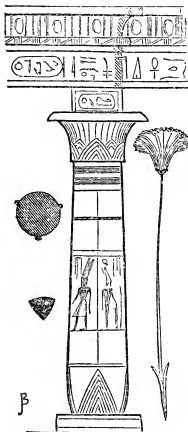
Fig. 3.



which rested upon the architrave. The proportion of the columns to the weight they had to sustain was extremely ample; and the pressure being always perpendicular, the self-destroying tendency of arched structures, where both lateral and perpendicular pressure is exerted, was entirely obviated.

Every architectural feature had its particular ornament engraved on its surface, and decorated with its appropriate colour.

Fig. 4.



Hall of Columns of the Memnonium.

In the *curvetto* of the cornice it was customary to place the name and titles of the Pharaoh or king, with the other significant decorations peculiar to that member of the entablature. The next member, the *torus*, or *bead*, had its special decoration; and the architrave stone was likewise symbolically ornamented with the names of the divinities to whom the temple was dedicated, and of the sovereign in whose reign it was built. The abacus of the column (Fig. 2) was invariably decorated with the royal titles. The capitals were painted in accordance with the intention of the form: if, for instance, the expanded papyrus was intended (Fig. 4), the leaves of the calyx would be yellow, and the filaments

green. Beneath were five horizontal divisions, which probably represented the blue and white linen bands with which the columns of the primitive temples were adorned on festive occasions. To these succeeded a representation of the king offering gifts to the gods of the temple; and, lastly, the yellow and red lines at the base of the shaft signified the brown leaves observable at the bottom of the stalk of the papyrus. A further intimation of the origin of this order of Egyptian column is the presence of three ridges extending up the shaft to the bands of the neck of the capital, by which the triangular form of the stalk of the plant was intended to be signified. (See sections at Fig. 4.)

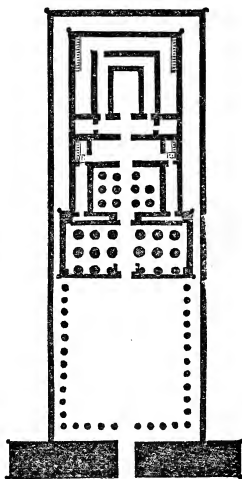
Thus every feature of the architecture had its meaning,—every member spoke its appropriate language.

The above is a description of the ordinary form of the temples of the age of the Pharaohs, but there are no two specimens now remaining which agree in all particulars.

The temples built during the reigns of the Greek and Roman kings may be thus described (Figs. 5 and 6):—

First, the propylon, with its truncated pyramidal towers, conducted into a square court surrounded on three sides with a colonnade. At the extremity of the court, and facing the gateway, was an elevated portico of six columns in line, and three or four deep. The uninitiated obviously were not permitted to enter beyond the court, for the columns of the first row are invariably joined by a dwarf wall,

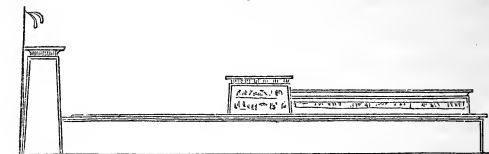
Fig. 5.



Edfou Ptolemaic Temple.

as in the Pharaonic temples, the only opening being be-

Fig. 6.



Elevation of Ptolemaic Temple.

tween the centre intercolumniation, to which were attached the valves of the gate.

To the portico succeeded a series of smaller chambers, the roofs of which were supported by four or by two columns. The centre chambers were lighted by small square openings in the roof, and those in the side by small openings in the walls, in no instance exhibiting the kind of clear story perforated with large openings, seen in the Hall of Columns of the Pharaonic temples.

Besides the characteristics above described, there is an elaborate form of capitals representing three stages of growth of the papyrus in one capital,—or sometimes the papyrus combined with other aquatic plants,—sometimes a collection of the lotus, and sometimes the full-blown papyrus alone,—but in no instance do we find the rectangular column, or the pier with the attached figure, or the single bud of the papyrus, or that form of column which represents several buds of the plant joined together.

Another distinguishing feature of the Ptolemaic temples is, that the masonry is even more perfect than that of the time of the Pharaohs, if we except the Pyramids and the granite temples of Lower Egypt.

For the front elevation of a Temple, we refer to the frontispiece, which presents a view of the Propylon of the Temple of Luxor.

The temples of the Roman period are usually inferior in extent, though similar in plan, to the Ptolemaic buildings; they are also remarkable for a yet more elaborate form of capital, even superior masonry, and still more salient and curvilinear forms in the sculpture and architectural decorations.

It is worthy of observation, that granite seems rarely to have been employed for architectural purposes in any part of Egypt excepting the Delta. In the Thebaid it was used chiefly for sculpture, the usual building material being the fine limestone, and still more commonly the fine sandstone of the quarries of Silsilis.

On comparing the foregoing description and plans, it will be seen that the temples of both the Ptolemaic and Roman periods differ from those of the age of the Pharaohs in the following very remarkable particulars.

In the Pharaonic temples there were two courts, whereas in the Ptolemaic there was but one.

There is no example in a Ptolemaic temple of a chamber like the Hall of Columns, but its place seems to have been supplied by the elevated portico, which was higher than any other part of the edifice.

The composite and ornate nature of the capitals of the latter era should be noted, as opposed to the simple forms of the Pharaonic period.

Next, the difference in the arrangement of the small chambers.

Then the absence of the clear story in the Ptolemaic buildings.

The superior masonry of the Ptolemaic and Roman periods.

And, finally, the difference observable in the relief and forms of the sculpture and architecture.

Before leaving this section of the subject, it is desirable

to add a few words on the mural sculptures of the temples of Egypt.

The most usual kind of mural sculpture practised by the Egyptians, and entirely peculiar to that people, seems to have been designed, like their buildings, to endure, and to hand down to the latest time the story of their greatness. The outline of the figure or object intended to be represented is cut into the smooth surface of the wall, while at the same time the minor forms and rotundity of the objects are represented within the incised outline. By this contrivance the most important feature,—namely, the general outline,—is, of necessity, the last part to suffer injury, for to obliterate it entirely the whole surface of the wall must first be destroyed; whereas, in the true basso-relievo, where the ground is cut away, leaving the figures, as it were, placed upon the surface, the salient parts would obviously be the first to be injured.

There are various modifications of this Egyptian style of sculpture: sometimes the outline is excessively deep, allowing of a greater rotundity of the parts within. At other times the surface of the figures is altogether much lower than the general surface of the wall. In other examples the outline is but very slightly incised, and there is then a corresponding slightness of rotundity, or flatness within. Besides this style peculiar to themselves, the Egyptians practised, but more rarely, the true basso-relievo, such as is common to all the nations of antiquity; but wherever they did so the sculpture is almost invariably in extremely low relief.

An Egyptian temple has been very aptly compared to a book, and its walls and columns to the pages on which the religion and history were inscribed, and so fully illustrated that even those who could not read might gain instruction from what they saw depicted.

As the design of Egyptian sculpture and painting seems

to have been more particularly to convey historical incidents in the most speaking and intelligible manner rather than to seek excellence or beauty of form, it was necessarily influenced by certain rules forming a kind of grammar of basso-relievo, designed to guard the art from running into a variety of caprices, to which it has been subject in modern times, and the rules thus laid down were never departed from.

In examining both Egyptian and Assyrian bassi-relievi, we must bear in mind that perspective was neither known nor attempted, for not till the decline of Greek art was there any endeavour to make that science subservient to sculpture, although imperfect attempts in the sister art were common, as may be inferred from the paintings found on the walls at Pompeii. The primary object with both the Egyptian and the Assyrian artist was to relate, in the most intelligible and readable manner, the historical events of his country. When, for instance, a battle-field, or the siege of an enemy's fenced city, is to be described, the background is to be understood to represent both the sky and the earth at one and the same time. The example we shall cite is from the Memnonium at Thebes.* In this scene the sky is the uniform background: the slain lie on it, and the vulture flies in it; the erect figures, and the walls of the city, the various circumstances of the battle in the distant parts of the field, as well as those on the embattled walls, and immediately under the fortifications of the fenced city, are all represented as in the sky. Thus the events themselves were individualised, and distinctly impressed upon the mind of the spectator, and more was conveyed to the imagination through the medium of the eye, than if the laws of perspective, which appeal especially to the judgment, had been known and observed, for then the distant figures, if seen at all, must

* See R. 2 of Principal Egyptian Court of the Crystal Palace.

have been depicted smaller, and made less distinct, than those in the foreground.

Sometimes, however, the background does not stand in this double relation, the subject permitting that throughout it should represent the sky only, while a horizontal line under each row of figures indicated the ground. In one representation at Medina Tabou,* the numerous figures, the captives and the captors, are advancing towards the king in four successive rows, and are laying the hands of the slain in so many heaps before him.

Another rule, to which there is not a single exception in all the bassi-relievi throughout Egypt, is, that the back view of the human figure is never represented except in the case of an enemy, and that rarely. It is curious to observe, in some of the sculptures, how the difficulty of the falchion appearing in the left hand is intended to be obviated by representing the back of the hand, thus converting the left hand into the right, without turning the back of the figure to the spectator.

Although this peculiarity of avoiding a back view of the figure is so very marked, the rule does not extend to the details of the body; on the contrary, it is most rare to find any attempt at delineating the front view of the foot, or of the face; however, whether the face be represented in front or side view, a profile eye is never found.

The conventionalism of increasing enormously the figure of the king, in the great battle-pieces on the walls of the temples of Egypt, is very remarkable; for there is only one composition in which the Egyptian hero is contending with anything approaching his equal in point of size. This composition occurs inside the temple of Aboo Simbel, and on the north wall of the Temple of Karnak.† The same con-

* See R. 5, Principal Egyptian Court of Crystal Palace.

+ R. 3. of the Inner Egyptian Court of the Crystal Palace.

ventionality is adopted by Homer, who describes the heroes of the Iliad as very much exceeding ordinary men in stature. This is not the only point of resemblance which the battle-pieces on the walls of the temples of Thebes bear to the battle-scenes described by the poet,—resemblances which are highly corroborative of the opinion of Mr. Hamilton, the distinguished Greek antiquarian (see “*Egyptiaca*,” pp. 118, 123), that Homer must have drawn his descriptions from the Egyptian sculptures.

This conventionality of size, however, is not, with the Egyptians, limited merely to the representations of the king or warlike hero, for it likewise occurs in the domestic scenes delineated in the tombs. In these the portrait of the great landed proprietor of the valley, seated in his chair, overlooking the productions of his estate, or the agricultural, commercial, or domestic operations, is always depicted on a much larger scale than the other actors in the scene; or when he is seen accompanied by his wife, receiving the homage of his family, or seated with her at the domestic board, surrounded by their family and servants, he and his wife occupy as much space as the whole family and attendants put together.

From these and other examples we may infer that the superior size simply typified persons of sovereign power, of official or domestic importance, or men of renown.

In Egyptian sculpture there is no example of an erect figure in the round, that has the right leg advanced before the left, all having invariably the left leg foremost, as if about to march. Another peculiarity of the round figures is, that the limbs are never entirely detached from the body of the stone, the portion of the work thus left being always painted white.

A further conventionality in Egyptian and Ninevite

sculptures, though not limited to them, as it descended to much later works of art, and arose from ignorance of the laws of perspective, is that in battle-scenes the buildings, as compared with the men, are utterly out of proportion, while the superior size of a city to fortresses or other buildings is merely intimated by the greater number of towers, windows, and doors.

In addition to the foregoing special characteristics, there are certain conventionalisms of colour which are worth noting.

The Egyptians chose to represent themselves with red and yellow complexions, using a pure red ochre for the colour of the men, and yellow ochre for the complexions of the women.

The hair of the king is frequently painted blue, but that of ordinary men black.

In representing the various nations with whom they had intercourse, they seem to have avoided conventionality of colour, and to have endeavoured to imitate the complexions peculiar to each.

Amun Ra, the chief divinity of Thebes, "the Lord of heaven," as he is called in the inscriptions, is always painted blue, and is, besides, distinguished by two high feathers upon his head.

The other divinities are commonly of the complexions of mortals, the males being represented red and the females yellow.

Each god and goddess is marked by some special head-dress and attribute, but the varieties are too numerous to admit of being detailed in our brief space; and we must, therefore, limit ourselves to pointing out the peculiarities of such as may appear in the scenes we purpose describing.

The heavens, or sky, are invariably represented by a strip of blue curving downwards at the inner side of each extremity (Fig. 7), and occasionally having upon it a row of five-pointed stars.

Fig. 7.



Water, seas, and rivers, are always represented by a series of zig-zag lines of a darker blue or green than the ground.

Mountains are represented of a yellow colour, with red spots upon it.

In concluding this epitome of what we may term the grammar of Egyptian art, we will merely add, that particular subjects are uniformly to be found represented in certain situations in all the temples, and will now proceed to describe some of the historical painted sculptures upon the walls.

J. B.

SONNET.

“ Man giveth up the ghost, and where is he ? ” — Job, xiv. 10.

THE brightest noon pales and is quench'd in night,
 The richest summer wanes to wintry dearth,
 The fairest flowers fade in their native earth,
 And lordly man is buried out of sight.
 Yet, as brief summer yieldeth store of fruit,
 And flowers bequeath imperishable seed,
 And as the sun from west to east doth speed
 Coming from out the dawn in gayer suit,—
 So does the good man live : fruitful and pure,
 His years are as the days of summer-time,
 And when at last he passeth in his prime
 A holy heritage doth still endure ;
 While swift his saintly pinions upward climb,
 And feebler faith to opening Heaven allure.

W. T. H.

DEVOTIONAL WRITERS.

RESPECTING this mortal life, this passing world, and all things appertaining to them, it may be remarked they have one character in common—they are unfinished. Everything is in commencement—nothing is complete. Such a state of things gives rise to endless wishes. And if these wishes are reasonable, they are properly transformed into prayers. God alone can grant a complete fulfilment; otherwise, the wanting can never be numbered nor the deficient supplied.

Two things strike us as highly desirable—a work on Providence, and a work on Devotional Writers. A survey of what God is doing without us, and a view of what God is doing within us, especially in those minds which are the leaders of others in the way of life.

Perhaps there is no way which more readily convinces us of the wide chasms which exist upon any given subject, than the attempt to write a treatise upon it. This would be the case with any one who attempted to write a history of Providence. He would find at once how very scanty were the materials, apart from those contained in the inspired writings.

The history of Providence may be divided into that of public and private providences. The first is more open to view. The second would be the still more difficult task; those secret touches of the Divine Power, which regulate the lives of individuals and the fortunes of families, either altogether escaping from the inattentive view, or being soon effaced from our oblivious and earthly memories. To use the beautiful expression of Wordsworth,

“ They are of the sky,
And from our earthly memory fade away.”

But the very evanescence of Providential interferences, so intermixed as they are with the ordinary occurrences of life, should only make us more watchful to catch, as it were, the sound of the departing wings of the unseen angels, who have been ministering to our inmost wants, or warding off invisible dangers from our heads.

The kindness of a friend is manifested, not only by the greatness, but by the minuteness of his benefits; and there is a sort of feminine delicacy which accompanies maternal affection, as distinguished from paternal love. But no feminine minuteness of care can equal the watchful and superintendent kindness of our heavenly Father, who, while He loads us with the greatest benefits, with untiring solicitude supplies us also with the least.

As the infinitely great, as well as the infinitely little, escape from the range of the human understanding; so our thoughts cannot reach many of the more minute providences which surround us; and even when we reach them in thought, we cannot express them in words. Like the higher powers of nature, which, though full of potency and the spring and moving principle of all that we perceive, yet are beyond the range of the senses; so those manifestations of silent but efficacious Divine interposition must be sedulously waited for and instantly noted down, lest they escape either the observation or the memory. How many remarkable providences relating to a former generation might have been noted down and transmitted to futurity, if the hearer, with pen in hand, had been ready to consign them immediately to paper! But now the objects of those wonderful preservations are removed from the earth. No trace remains of those Divine manifestations of mercy; no pillar is set up to perpetuate their remembrance here below. Like prayers offered up and answered long generations ago, there is a perpetual memorial of them in heaven, but no trace of them on the earth which we inhabit.

In addition to a work upon Providence, there might also be a treatise upon Devotional Writers ; thus uniting the view of God's operations without us, with a treatise on the operations of His Spirit within us ; and thus connecting His providential preservations, with the illustrations of His teaching, and the consolations of the great Advocate and Comforter.

Though Scripture be the sole fountain of all that deserves the name of religion, yet the religion even of true believers is more derived from religious writings than directly from the Scriptures themselves. If we ask what most characterises the Scriptures ? It is thought. As the Bible is the Book of books, so its contents are the Thought of thoughts, demanding, provoking, supplying thought without end. Such we might well suppose to be its character, considering its Author. God is a Spirit ; and thought is the action of Spirit and the purest produce of mind.

But thought is a high exercise ; painful to our low and earthly faculties, and readily dispensed with where not absolutely necessary. And hence men favour classes who think for them, both with respect to their temporal and spiritual affairs. And hence religious writings are more read than the Scriptures themselves, because here the effort has been surmounted by others ; the thoughts are already expanded and the feelings educed which the meditations upon passages of Scripture were suited to inspire. It is true, the feelings which are merely the reflexion of the feelings of others, are not so valuable as the original impressions, and nothing can compensate for the painful but salutary effort of evolving truth for ourselves. Still, the union of thinking for ourselves and profiting by the thoughts of others, will jointly produce the most profitable results ; and they who meditate most upon the Bible will most value and best appropriate the meditations of others.

If it were asked, who has most contributed to the devotional thoughts and feelings of Britain? We think the answer would generally be Leighton. Yet with many, if not most, Doddridge has had the initiative. Most inquirers begin with the "Rise and Progress," before they nourish their minds with the Commentary upon St. Peter. And the first teaching will be apt to retain an enduring influence upon the mind. The "Rise and Progress" of Doddridge was commenced and concluded with much prayer, and those prayers have received an abundant answer. The serious inquirer there finds a seriousness congenial to the state of his own mind. But he will by no means meet there with the simplicity of the Gospel. Having used the "Rise and Progress" as a guide-book ourselves, we speak from experience when we say, that it has a great tendency to perplex the way of salvation.

We hope the prospect is somewhat clearing up, but those who had occasion to inquire of many eminent divines a generation ago, "What must I do to be saved?" would have received answers somewhat different from the plainness of the Gospel. "Are you an inquirer? Then be a serious, be an earnest inquirer." Stop the stream of corruption and wait for something, it is not precisely ascertained what, possibly for some sensible manifestation of the Divine Power upon the mind, apart from the truth. Even from the same eminent individual we have received varying and veering advice—now "Cease from evil and wait,"—now "Cast yourself upon the Saviour at a peradventure,"—now "Pray without ceasing." It was in vain to remark that the last advice supposes the soul already saved, the new life begun, and not only begun, but in strong and healthy exercise. The last thought of, and least recommended, seemed to be the Gospel direction, "Believe and live." Before you think of doing anything, hear what God has already done, and

you will perceive that the work is finished, and you will perceive that nothing remains but to hear, understand, and believe, the testimony of God concerning His Son.

We have often to distinguish between what ought to be, and what is. If the "Rise and Progress" be taken as a map of the plan of salvation, it points out a very circuitous path to the cross. But if it refers rather to what is than to what ought to be, it rightly describes the track that is trodden by many who are uncertain about their way. One great difficulty about the reception of the Gospel consists in the truth being so simple and so divine. "My thoughts are not your thoughts, neither are your ways my ways, saith the Lord." It would be very desirable that a Gospel preface should be prefixed to the "Rise and Progress," declaring a free, full, and present salvation; while the body of the work would still indicate the path more generally chosen, consisting of various stages of advance, instead of an immediate access to the foot of the cross.

It is much to be lamented that Doddridge, whose piety is so serious and so persuasive, should have fallen upon evil days; when the glory of the Gospel was somewhat obscured; when not only the noble and commanding views of the first Reformers should have become somewhat obsolete, but even the piety of the Puritans was suffering from the admission of a false candour, and the prevalence of semi-rational views.

He who begins with Doddridge would naturally continue and end with the works which Doddridge edited; the Commentary on St. Peter and some other excellent works of Leighton. If asked, what work comes nearest to the Scriptures? we would answer, though with some consideration, and consequently hesitation, The writings of Leighton. He has not the fervid genius, nor the commanding views of Gospel truth, which Luther possessed; nor the clear and philosophic understanding of Calvin; nor that peculiar

solemnity of Howe, which places the reader upon the verge of eternity ; but he has a portion of all the excellencies of the most excellent men, and a very deep infusion of the Christian spirit peculiarly his own. The character of his writings is eminently heavenly and catholic ; and these two qualities go together and influence each other. There are no sects or denominations in heaven.

There are some things that require explanation about Leighton, in order fully to harmonise his life, his mind, and his writings. His father stands in great opposition to both his sons ; and this must be attributed partly to a principle of revulsion. After making every allowance, it seems strange and still unaccountable that Leighton should join the party that so persecuted and savagely mutilated his father. The fierce dogmatism of his father may have inclined the son to mysticism ; of which there are strong indications in a short paper, "Rules and Instructions for a Holy Life" (if it be Leighton's, for it is unworthy of him), and but a slight tinge in his better writings. The first sentence of the Commentary of St. Peter might throw some light upon the workings of Leighton's mind. "The grace of God in the heart of man is a tender plant in a strange unkindly soil," &c. Religion with Leighton was therefore an exotic, and generally under glass. But we have a double task to perform ; first, to protect it from unkindly blasts ; and, secondly, to acclimate it and give it a hardier character and an out-of-door existence. It was in this part of religious culture that Leighton most failed. His piety seemed too much confined to his closet, and did not sufficiently encounter the ruder influences of the world.

Though latterly an Episcopalian, more, however, from compliance than choice, there was nothing hierarchical or priestly in Leighton's views ; he saw clearly there can be no priest without a sacrifice, and as there is but one abiding

sacrifice, the great Atonement, so there is but one abiding Priest, the Lord Jesus Christ. Through their union with Christ, all His people are kings and priests also. There remains, therefore, among them the sole distinction of the teachers and the taught. But that distinction does not divide them into clergy and laity. "All believers," says the Archbishop, "are His clergy; and as they are His portion, so He is theirs;" in other words, clergy and laity are identical. All believers are God's people, or His laity; and all His people, or laity, are the lot of His inheritance, or His clergy. Leighton is most distant from anything of the spirit of a caste; he felt that all believers are one brotherhood through the Lord Jesus, and that by His death every wall of partition has been taken away.

None have more clearly seen or strongly urged, that holiness and happiness are identical, and that conformity to the Divine character is the sum and end of religion. God must reign; but if He reign without us, and do not reign in us, our wills must be crushed by the Divine will; and we must ever be unhappy till we be conformed to Him.

Leighton beautifully points out the two opposing streams of the World and of the Word. The World knows not God; has no light of its own, but wandering fires; is dark, and in love with darkness; seeks to shut out God, and to make itself its own centre and end. Its maxims, its course of life, are atheistic, not based upon God and immortality, and seeking to shape out for itself a rest and a paradise here below. One irreligious generation bequeaths its maxims and its example to the succeeding one. "The stream of sin," Leighton remarks, "runs from one age into another, and every age makes it greater, adding somewhat to what it receives, as rivers grow in their course, by the accession of brooks that fall into them; and every man, when he is born, falls like a drop into the main current of corruption,

and so is carried down with it, and this by reason of its strength, and his own nature, which willingly dissolves into it and runs along with it." In opposition to this stream of corruption, ran a tide of the waters of life in the writings of inspired men. "This sweet stream of their doctrine," says Leighton, "did, as the rivers, make its own banks fertile, and pleasant as it ran by, and flowed still forward to after ages, and by the confluence of more such prophecies, grew greater as it went, till it fell in with the main current of the Gospel in the New Testament, both acted and preached by the Great Prophet himself (whom they foretold to come), and recorded by His apostles and evangelists, and thus united into one river, clear as crystal. This doctrine of salvation in the Scriptures hath still refreshed the city of God, His Church under the Gospel, and still shall do so, till it empty itself into the ocean of eternity." The above passage could scarcely be surpassed either for its beauty of expression, or its deep insight into the structure of Scripture, and the ever-flowing enlargement of God's dispensation of mercy. -

Leighton gives a beautiful and complete summary of the answer to the question, "What shall I do to be saved?" Only this. First receive so great a salvation, then love so great a Saviour. And for advice. Remember, this world is but a passing pageant; a procession passing through the street, and then vanishing away for ever. This thought is often recurring to Leighton, and always, no doubt, he found it useful. The more we consider the things of time as shadows, the less we shall be disquieted by them. They are vain shadows in every point of view. Live without care, and care only to please God. He himself will take care of other things. Thus shall thy life become every day less earthly and more heavenly, till heaven itself become thy home.

J. D.

(To be continued.)

OURSELVES.

THE SENSE OF SIGHT.

THE appendages to the Eye, and their uses, have been already noticed.*

The *Globe, or Ball of the Eye*,—the *Optical instrument*,—is a dense, membranous cyst, filled with transparent media, or *Humours*, as anatomists term them. It consists of three principal coats. The outermost—the *Tunica sclerotica*—is white, opaque, slightly compressible, nearly, if not quite, insensible, and very tough or hard, as its Greek name implies. It is perforated behind for the admission of the optic nerve. A portion of the anterior part of it, amounting to about a fifth, is deficient, and its place is supplied by a larger segment of a smaller sphere, called the *Transparent Cornea*, which renders it more prominent than the rest of the eyeball. This beautiful window is made up of six separable laminae placed one upon the other, united at their edges, having a thin colourless fluid interposed between them. At its junction with the sclerotic coat, the edges of both are neatly thinned off, which renders their smoothness quite continuous.

Immediately within the sclerotic, and adhering firmly to it, is the second coat, the *Choroid*. It is a soft, dark brown membrane, consisting almost entirely of the blood-vessels which supply the eye. Over its inner surface, and probably contained in the cells of a very tender tunic, is spread a black, viscid substance, called the *Pigmentum nigrum*, the black pigment.†

* “Excelsior,” vol. iv., p. 407.

† Less than half the choroid coat, in the eye of the horse, and that, not the part in the field of ordinary vision, but chiefly the lower portion, is covered with this pigment. In its stead there is a lucid carpeting of a

The innermost coat, the *Retina*, is a thin, net-like, (hence its name) delicate expansion of the optic nerve ; the pulpy material of which is rendered coherent by the intervention of many minute membranous filaments. It is translucent and almost colourless, very insensible, but highly sensuous of its own proper stimulus, the light. At about two lines (the fifth of an inch), distant from the centre point of the retina, there is on it a yellowish spot, which marks the axis of the eyeball and of vision. At, and immediately around it, is the region of most distinct perception.

The interior of the capsule is filled with three transparent *Humours*, of different densities,—the *Aqueous*, the *Vitreous Humour*, and the *Crystalline Lens*.

The *Aqueous Humour* is nearly as limpid as water, and quite as clear. It occupies the space between the transparent cornea and the crystalline lens, called the anterior chamber of the eye. Floating in it is a circular, perforated curtain, termed the *Iris*, which divides the chamber into two unequal compartments. The outer margin of this elegant curtain is fixed by a ligament to the edge of the choroid coat, just where the sclerotic and transparent cornea are united ; its inner edge is free and disengaged, and forms the margin of the opening known as the *Pupil*.

The iris is principally composed of two sets of contractile (muscular ?) fibres,—one concentric, by whose action the

bright green colour, called the *Tapetum*, which may be readily seen by looking into the eye, in the dusk of evening. It is dark green in the ox and sheep, yellow in the cat, and all his varieties, brilliantly so in the lion. The dog, fox, and wolf, have it grey. In the badger it is quite white. The ferret, as well as white and cream-coloured horses, seem to have no pigment at all ; in them, therefore, and in the human albino, the pupil appears to be red : the blood-vessels of the choroid coat yielding the colour. In predatory animals, and those which feed at night, or in the dark of evening, it seems to give vigour, by reflection, to the sense of sight.

size of the pupil is lessened, though its form is preserved ;* the other radiating : when these contract, they draw the inner toward the outer margin, and so enlarge the opening. The anterior surface of the iris, painted of different hues in different persons, yields all those beautiful varieties of colour, which give sanction to its name. It is richly supplied with nerves. The hinder fold of it, the *Uvea* (grape-coloured), is coated thickly with the *Pigmentum nigrum*.

The *Crystalline Lens* is a solid, transparent substance, enclosed in a transparent capsule. It is doubly convex, with surfaces of different convexity ; and polyzonal ; consisting of a series of concentric layers, which include one another, as those on an onion do : *their density decreases as they recede from the central nucleus*. Its posterior surface, which has the greater convexity, is embedded in the *Vitreous Humour* :

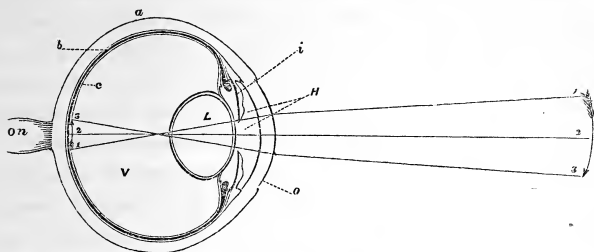
This, the most considerable in quantity of the three humours, for it occupies nearly three-fourths of the globe of the eye, is, apparently, a soft, transparent, tremulous, semi-solid substance, but it really consists of a thin watery fluid, contained in a great number of irregularly-shaped compartments, formed by the intersections of a delicate membrane. It is invested in its own proper tunic, called the *Hyaloid membrane*.

The annexed little sketch, in outline, shows, tolerably well, a section of the globe of the eye, its coats, and humours :—

a, the Sclerotic Coat ; thick and strong, extending inwards to *b*, the Choroid, lined internally with the black pigment ; *c*, the Retina ; *o*, the Transparent Cornea ; *o, n*, the Optic Nerve ; *V*, the Vitreous Humour ; *L*, the Crys-

* The pupil of the horse, the ox, sheep, and other grazers, is oblong, and the axis of the longer diameter is horizontal. It is round in the cat and all his tribe ; but, on contracting, narrows perpendicularly.

talline Lens ; *H*, the Aqueous Humour : the lower line from *H* points to the opening of the Pupil ; *i*, the Iris.



The dark parts, extending from the choroid coat to the sides of the lens, are called the Ciliary processes.

Every part of this curious apparatus is constructed and arranged with reference to one especial purpose—to *produce on the surface of the Retina a miniature picture of every visible object.*

Objects are rendered visible by the rays of light which emanate from them, if they are luminous, or proceed from them, by reflexion, if illuminated. So long as the rays traverse the same medium (the air, for instance), they pass through it in straight lines, if it continues of the same density ; and, if they meet with a new medium (as glass or water), although of a different density, having a plane surface, and they fall *perpendicularly* on it, they still pursue their original, rectilinear course. But, if they fall at all *obliquely* on the surface of the new medium ; or if it is presented obliquely to them, which amounts to the same thing in effect, then their course is altered, and different results ensue. Some of them are dispersed irregularly ; others become *reflected*, in a prescribed path, at a definite angle : this is termed the *angle of their reflexion* ; it coincides in amount to the ob-

liquity at which they strike on the plane surface, and which is called their *angle of incidence*.

The new medium, being transparent, allows a large portion of the rays to pass into or through it. These, too, are affected in different ways. Some of them are absorbed, or lost by partial reflexion and interference; others, and these form the greater part, become deflected from their original course; they are said to be *refracted*, and the amount of their refraction depends upon the density of the new medium; the greater its density, the greater the refraction, and *vice versâ*.

But the *nature* of the material is not the only circumstance which determines their new path; its figure, the form of its surface, is another element in regulating their course. If it has plane surfaces, above and below, as a plate of glass has, and the planes are parallel to one another, the rays pass through it in straight lines parallel to each another.

If the surfaces are placed diagonally, as in a *prism*, the rays become decomposed, in consequence of the unequal refrangibility of the coloured rays of which they are composed, and a *spectrum* is formed.

If one or both the surfaces are *concave*, then the rays become separated, and diverge from one another, as the sticks upon a fan do; or if one or both the surfaces are *convex*, the rays converge, and form a *cone of light*. In either case, the degree of convergence or divergence depends upon the degree of convexity or concavity of the refracting surface.

The apex of the cone of light, called the *focus*, is necessarily the point of greatest illumination; for at it the converging rays meet with those which pass through the lens directly, and which are called the axial ones.

Though at it the rays intersect one another, and seem to

commingle, yet they do not lose their identity: no fusion takes place; each retains the special impression made upon it by the form, colour, and distance of the object, whence it proceeded, and by which it was conditioned.

From the focal point the rays, each continuing its own proper course, again issue and form another cone, the counterpart of the former, with this difference, that their position in respect of the axial line has become altered; the upper have become the lower, the outermost right are now the extreme left, and so on. This is readily ascertained by holding a convex lens, the glass of a spectacle, between a candle and a sheet of white paper. On the distal side of the focus, beyond the point of greatest illumination, an image of the candle-flame, vivid and distinct, will be seen, but *upside down*. When the photographer has adjusted the lens of his camera-obscura, the miniature portrait of the sitter, in all its details of feature, expression, colour, &c. is depicted, *inverted*.

In the formation of lenses for the camera, or for the telescope or microscope, but especially for these latter, which require the greater exactness, one of the greatest difficulties the optician meets with, arises from what is termed *spherical aberration*. This is a consequence of the law of refraction by spherical surfaces, when the medium (as glass) is of the same density throughout. Such forms of surface do not converge either parallel or divergent rays into one mathematical point or focus. The rays which pass through a convex lens, a lens formed of two such surfaces, farthest from the axial line, the line of direct transit, become most refracted, and are the soonest centred; those nearer the central line, converge at a point farther off; while such as are nearest to the central line, being least refracted, unite and form a focus still more distant from the surface of the lens; there are thus produced different foci, and a good deal

of confusion in the principal image. To obviate this, there is placed before the lens a partition with a perforated centre, called a septum or diaphragm, which intercepts the outermost rays, and allows only the more central ones to pass, whose aberration is inconsiderable.

Another difficulty in the formation of lenses is occasioned by the nature of light itself. For, a ray of white light is not simple and uncompounded; it consists of subordinate colorific rays, which are unequally refrangible under the same circumstances. The violet are the most refractile, the ensuing ones in the spectrum less so, and the red least of all. This causes what is called *Chromatic Aberration*. As every convex lens is to a certain extent a prism; for its limitary surfaces are not parallel to one another, some of the rays in passing through it become resolved into their coloured constituents, and converge at different foci; and the outlines of the images which it produces are shaded more or less with prismatic colouring. All single convex lenses are, therefore, more or less, *chromatic*. To remedy this defect, the optician adapts to one another two lenses of different forms, made of different kinds of glass, crown and flint, which have differently refractile powers; by this combination, without very materially lessening the magnifying power of his instrument, he obtains a colourless, or nearly colourless image. Such lenses are called *achromatic*.

In the adaptation of lenses to optical instruments, and in their adjustment, reference is necessarily had to the effects produced, by a difference in the distance of the same object, or the difference in the distance of different objects, from the surface of a lens.

If an object is far off, the rays which proceed from it, although originally divergent, arrive at the lens as if they were parallel to one another, the cone of light is long, and the focal point a distant one. If the object is near, then, as

the divergence of the rays from it is considerable, their refraction is greater, the cone of light is short, and the focal point near the lens ; and for every intermediate distance there is a corresponding variation. These differences are called, for want of a better term, the *Aberrations of Parallax*. By fixing the lens in a sliding tube, which is capable of being lengthened or shortened, its relative position can be altered, and the place of the focal point adjusted and determined at pleasure.

These details, which seem to relate more immediately to the construction of optical instruments, have, nevertheless, direct reference to the structure and functions of the eye itself. For, *it is essentially a camera obscura*. The transparent cornea, and the humours with which the eyeball is filled, are the refracting media which collect the rays, and form the pencil of light by which the images of external objects are delineated: the surface of the retina is the ground, the canvass, on which they are depicted.

If a portion of the sclerotic and choroid coats at the back part of the eye of an ox or sheep are dissected away, and its place is supplied by a piece of oiled paper, and the eye so prepared is fitted into an opening in a sheet of paste-board, or in a shutter, with the transparent cornea presented towards any luminous object or group of objects, they will be seen inverted, but distinctly and beautifully imaged on the surface of the paper.

*That this image should be produced clear and well defined; not too bright to dazzle, nor too faint to be obscure; without any but its own proper colouring, on the sensitive surface of the retina, is essential to seeing well.**

* The perfection of the imaging, and the extreme delicacy of sensation, may be judged of from the fact, that the sun, which occupies about half a degree in space, produces on the retina an image, the diameter of which is, perhaps, rather less than the $\frac{1}{254}$ th part of an inch.

The difficulties which have been pointed out as occurring to the optician in the formation of his instruments, recur equally in the construction of the eye. For though the rays of light are refrangible, the laws of light are not. They are inflexible, and must be deferred to. In strict relation to them, therefore, the materials of which the organ is composed have been chosen, and their adjustment regulated; they have been selected with the nicest discrimination, and put together with the most consummate skill. Every difficulty has been met, every object attained, to make it as perfect, and as practically useful as possible.

Spherical Aberration has been obviated by employing a lens (the crystalline) with elliptical instead of spherical surfaces, and by constructing it of *layers of different densities*; by both of which, inequality of refraction is avoided, and distinctness of vision, so far, secured.

Again, such care has been taken in proportioning the different humours, which have differently refractile powers, to one another, that they are *mutually corrective*: Prismatic colouring is nearly neutralised; and the eye, though not absolutely *achromatic*, is sufficiently so for all the purposes of life.

For a long time it was believed that the other difficulty, the *Aberration of Parallax*, arising from the different distances of different objects, was obviated by an alteration in the convexity of the cornea, and a co-incident change in the relative, perhaps the real, situation of the crystalline lens; the effect of which would be to render uniform the place of the focal point. A slight amount of muscular pressure, on the globe of the eye, would be sufficient to produce the requisite changes.

Mr. Ramsden, a very eminent optician of the last century, contrived an apparatus by which he thought he could test the sphericity of the cornea, measure its differing convexities,

and so determine if a person was looking at an object far off or near. His observations led to the conclusion, that a continually-varying convexity was the true solution of the difficulty.

Some more recent researches of Dr. Young have thrown a good deal of doubt on the accuracy of those experiments and deductions, and have left the fact still unexplained. Its explanation will very probably be furnished by the investigations of comparative anatomists.*

Apart from these difficulties, the function of the eye, considered merely as an optical instrument, is very simple, and will be easily understood. The rays of light which proceed from a luminous body, (as from the different points 1, 2, 3, of the inverted arrow in the little diagram,) strike upon the surface of the cornea; they become refracted by it, by the aqueous humour, and by the crystalline lens, in different degrees; and converge at a point in the vitreous humour, behind the crystalline lens: again diverging, they form an image (as the upright arrow 3, 2, 1,) on the surface of the retina.

But all the rays which fall upon the cornea do not pass through it. Some become reflected from its surface as from the surface of a convex mirror, and occasion the miniature pictures which we see, on looking at each other's eyes. Some are intercepted by the iris; a few, irregularly dispersed, give brilliancy and lustre to the eye; the rest form the visual image.

It will hardly have escaped the reader's notice, that the image formed on the retina is described as an inverted one:

* The sclerotic coat of the seal has its anterior and posterior segments very firm; the middle zone is considerably softer and compressible; sufficiently so, to allow of an elongation of the visual axis by lateral pressure.

or the observation of any person, that though we have two eyes we only see one object.

To account for the erect impression from an inverted image, and which obtains equally in every position of the head, whether, in relation to the object looked at, it is perpendicular, or inclined at any angle, or topsy-turvy, many ingenious explanations have been proposed. Their number and variety show how unsatisfactory each has been. And the fact remains still unaccounted for. The correction, however effected, is evidently congenital, and not obtained by experience; for, persons who have been born blind, and afterwards obtained their sight, see objects at once erect.

In the case of the ear we found a parallel to the unity of effect produced by the action of two organs, in the identity of tone, resulting from the action of two corresponding strings in different musical instruments, if accurately tuned; and were satisfied with the parallel. And if the parts of the retina on which the images are formed were always correspondent in both eyes, as they are when we look at an object directly before us, we might be the less surprised at the unity of the effect produced. But they are not: for whenever we look sideways, non-identical portions of the retinae are impressed, and yet there is no seemingly double vision. There are proofs enough to show that each eye communicates its own view to the brain, and that it is *there* the two impressions are combined into one perception.

The practical usefulness of the eye is greatly enhanced by what opticians term "its mounting." The horizontal movement of the eyeball within the socket amounts nearly to 110° , its perpendicular to about 100° . The head turns on its own pivot, to either side, more than 70° ; and vertically, almost as much. On an emergency, the position of the whole body is easily changed. All the movements are so

easy, that the instrument, almost without our consciousness, is brought to bear on any object, wherever placed ; and the range of vision nearly unrestricted.

Moreover, the eye is *self-cleaning*, *self-adjusting*, and, like the rest of the fabric, to a certain extent, *self-repairing*.

The value of sight, as an inlet to knowledge, and a source of enjoyment, no one can duly appreciate. Happily comparatively few have to bewail its loss—a loss how greatly to be deplored !

The Lament in “ Samson Agonistes ” is but a transcript of Milton’s own feelings, who had both possessed and lost it :

“ But chief of all,
 O loss of sight, of thee I most complain !
 Blind among enemies, O worse than chains,
 Dungeon or beggary, or decrepit age !
 Light, the prime work of God, to me is extinct,
 And all her various objects of delight
 Annull’d, which might in part my grief have eased ;
 Inferior to the vilest now become
 Of man or worm : the vilest here excel me ;
 They creep, yet see ; I, dark in light, exposed
 To daily fraud, contempt, abuse, and wrong,
 Within doors or without, still as a fool,
 In power of others, never in my own ;
 Scarce half I seem to live, dead more than half.
 O dark, dark, dark, amid the blaze of noon,
 Irrecoverably dark, total eclipse
 Without all hope of day !
 O first-created Beam, and thou, great Word,
 ‘ Let there be light, and light was over all ;’
 Why am I thus bereaved thy prime decree ?
 The sun to me is dark,
 And silent as the moon,
 When she deserts the night,
 Hid in her vacant interlunar cave.
 Since light so necessary is to life,
 And almost life itself, if it be true,
 That light is in the soul,

She all in every part. Why was the sigh
 To such a tender ball as the eye confined,
 So obvious and so easy to be quenched?
 And not, as feeling, through all parts diffused,
 That she might look at will at every pore?
 Then had I not been thus exiled from light,
 To live a life half dead, a living death,
 And buried; but, O yet more miserable!
 Myself my sepulchre, a moving grave;
 Buried, yet not exempt,
 By privilege of death and burial,
 From worst of other evils, pains and wrongs."

And again, in "Paradise Lost:"—

"Thus, with the year
 Seasons return: but not to me returns
 Day, or the sweet approach of even or morn,
 Or sight of vernal bloom, or summer's rose,
 Or flocks, or herds, or human face divine;
 But cloud instead, and everduring dark
 Surrounds me, from the cheerful ways of men
 Cut off, and for the book of Knowledge fair
 Presented with a universal blank
 Of Nature's works, to me expunged and rased,
 And wisdom at one entrance quite shut out."

But "He tempers the wind to the shorn lamb." Those who have lost their sight are generally very cheerful. The children at the Blind Schools are proverbially so. Dr. Reid, in his treatise on Nervous Diseases, mentions the very remarkable suggestion made by a blind person, in whose hearing the friends of a hypochondriac were consulting what it was best to do for him. "Oh!" said he, without hesitation, "put out his eyes."

P. S.

NOTES ON GREAT PICTURES.

“THE TRAGIC MUSE,” BY SIR JOSHUA REYNOLDS.

ALTHOUGH England has hitherto earned a much less distinguished name in Art than several of her Continental neighbours, in some departments she has produced her rivals of the very greatest names of foreign states ; and, like Venice, her development of Art has been in strict accordance with her peculiarly social development. Venice, the city of merchants and the emporium of commerce, her thoroughfares thronged with the subjects of many nations from the East and from the West, presenting a constant display to the eye of the painter, so widely different from the other capitals of the numerous Italian states, necessarily developed a distinct and peculiar taste in her artists. The many-coloured costumes of the East engendered a distinctive love of dress in the Venetian painter, so that even the most ordinary religious subject was rendered with all the magnificence of a state feast : the external elements of art prevailed, and the style of the Venetian school became characteristically the ornamental, the church traditions serving only as the ordinary material for the display of pomp and magnificence.

In England, as pictures are virtually excluded from the churches, ecclesiastical art, so important abroad, has been almost impossible ; and what is commonly termed “historic art,” from the almost exclusive private patronage upon which it had to depend, has been nearly equally depressed.

When we deprive the field of art of both the ecclesiastical and the historical element, little that is really exalted remains. Notwithstanding our close vicinity to Holland, the

familiar domestic scenes which have made the names of the Dutch painters so famous, found few advocates in this country.

Even from the earliest periods of State patronage in England, in the sixteenth century, portraiture is the only line that has received any great development till within quite recent times.

Various English painters have attempted what are considered the higher walks of imaginative art; but unless they have united their more ambitious efforts with portraiture, they have uniformly failed in success, with perhaps the single exception of Benjamin West. Romney and Gainsborough, two of the most successful of Sir Joshua's contemporaries, owed their prosperity to their portraits, in which they were accounted by many even the rivals of Sir Joshua Reynolds as portrait-painters.

Sir Joshua likewise combined history with portrait in later life; and though he produced several very celebrated works of an historical character, it is by his portraits that he has acquired his great name in the British school. Many of these are of a peculiarly successful and great character, in which, without sacrificing individuality, he has embodied a general idea and commanded a general interest.

"Mrs. Siddons as the Tragic Muse,"—of which a fine duplicate at Dulwich, painted for M. De Calonne in 1788, is accessible to all—the original is in the Marquis of Westminster's collection,—is one of the most remarkable works of Sir Joshua, and decidedly the greatest of all his idealised portraits. As a portrait, it may be considered, perhaps, the finest in the world. Even Barry says of it, "It is both for the ideal and executive the finest picture of the kind, perhaps, in the world. Indeed, it is something more than a portrait, and may serve to give an excellent idea of what an enthusiastic mind is apt to conceive of those pictures of

confined history, for which Apelles was so celebrated by the ancient writers." The actress herself, seated on a massive arm-chair or throne, is, as regards both pose and costume, as commanding and magnificent a figure as can be well imagined. Behind her throne are two sombre ministers of evil or of vengeance; the one on her right holding in his hand a dagger, the one on her left raising in both his hands a cup of poison. The chiaroscuro is beautifully managed, the principal light falling so completely on the upper part of the figure of the "Muse" herself, as to make all the accessories thoroughly subordinate; and so successfully, that the fact of all being supported on clouds is, except on a detailed inspection, wholly unobserved. The pose of the figure was chosen by Mrs. Siddons herself, who always expressed a high appreciation of the picture.

A very fine print of this remarkable picture, by Francis Hayward, was published in 1787: the whole effect is admirably given. The original picture was valued by Sir Joshua at 1000 guineas, though he sold it to William Smith, Esq., M.P. for Norwich, for 700. The Marquis of Westminster bought it, in 1822, for the large sum of 1760*l.* Mrs. Siddons, its subject, survived until 1833: she was in her twenty-eighth year only when the picture was painted.

This picture of the "Tragic Muse," though carrying the principle to its utmost extent, displays only the ordinary character of all Sir Joshua Reynolds's finest portraits; they were most of them more or less fancy pieces, especially his female portraits. It was this general interest which he thus contrived to give to his pictures, which places him so much above the ordinary portrait-painters. Notwithstanding that two whole generations have passed away, and the subjects of many portraits are known only by the casual record of their names, from the skilful treatment of his subjects

they remain as interesting to posterity as mere pictures, as they were formerly in their individual characters as portraits. The National Gallery affords two fine examples of this class of Sir Joshua's works, in the large picture known as the "Graces decorating a terminal figure of Hymen," which is a portrait of three sisters, daughters of Sir W. Montgomery; and the small picture, "Heads of Angels," which is studies of the head of a daughter of Lord W. Gordon. "Lord Heathfield," in the National Gallery, is another example of what may be termed the historical portrait of an admirable character.

Sir Joshua Reynolds is commonly considered the founder of the English school. He established a new and original style in this country, and certainly exerted an unparalleled influence on the younger artists of his time, which has ruled the English taste with little interruption till within the last quarter of a century.

Sir Joshua substituted, for the hard, dry manner of Sir Godfrey Kneller and his contemporaries, a rich florid style, eventually erring, perhaps, as much on the other side; the two tastes in perfection are thoroughly well illustrated and contrasted in the works of Holbein and of Rembrandt. If Holbein may be considered the great model of the former, Rembrandt exhibits the canon of the other. The richer and more effective style of portrait-painting of Vandyck had declined in England at the close of the seventeenth century: William Dobson (1610-46) and Robert Walker (died about 1650) were the last English painters worthy of this school. The German supervened on the Flemish taste, and the English painters who represented this latter school of portrait, and who were Sir Joshua's more immediate predecessors, were John Riley (1646-91), Jonathan Richardson (1665-1745), and Sir Joshua's own master, Thomas Hudson (1701-79). From the middle of the eighteenth century to

far in the first half of the nineteenth century the influence of Sir Joshua's example was paramount. This circumstance is the most signal tribute that could be paid to powers really great, though not of the highest order: few artists have even formed a school, but fewer still have led a nation.

Joshua Reynolds was born at Plympton, in Devonshire, July 16, 1723; his father was rector of the parish of Plympton St. Mary. Young Reynolds was destined for the medical profession, but Jonathan Richardson had some few years before published an essay on "The Theory of Painting;" this book fell into the hands of the young amateur, and he from that moment resolved to become a painter.

He was placed, in 1741, with Hudson, but after working together for two years they fell out and agreed to separate. The pupil returned to Devonshire and set up as a portrait-painter at Plymouth Dock, where, through the interest of Lord Mount-Edgewcombe, he formed a good connexion among naval men, and Captain (afterwards Lord) Keppel proved a valuable friend to him. When his father died, in 1746, Reynolds came to London and took rooms in St. Martin's Lane, then a favourite resort of painters. In 1749, he accompanied his friend, Commodore Keppel, in the *Centurion*, to the Mediterranean, and visited Rome, where he at last beheld the masterpieces of his art; and he has the candour to tell us that the grand works of the Vatican disappointed him, but he confesses at the same time that "he felt his own ignorance and stood abashed."

While in Italy he did not spend his time in copying; this he very properly considered a "delusive kind of industry." From Rome he went to the other cities of Italy renowned for their works of art; one of the last of those places was Venice; and the Venetian school, notwithstanding the high eulogium he has pronounced on the masterpieces of

Michelangelo and Raphael, made the deepest and most active impression on his taste. He returned, in 1752, to his old practice as a portrait-painter in St. Martin's Lane, after an absence of three and a half years.

The portrait of Giuseppe Marchi, a young Italian assistant that he had brought with him from Rome, in a Turkish dress, was the first example of that more effective and richer style of colouring which henceforth characterised the works of the future First President of the English Royal Academy. His old master, Hudson, when he saw this portrait, exclaimed, with an oath, "Reynolds, you don't paint so well as you did when you left England!" Another portrait, a full-length of his friend, Commodore Keppel, established his reputation as the first portrait-painter of his time. He at first, after his return, painted a head for ten guineas; in 1758, when in Newport Street, he charged twenty guineas for a head, forty for a half-length, and eighty for a whole-length; and in 1761, when he purchased his house in Leicester Square, he valued his time at five guineas an hour.

He had now so much business that he employed several assistants, of whom his Italian friend Marchi, and the well-known Peter Toms, the drapery painter, were the principal. 1761 was the first year of public exhibitions of pictures in London, and one of Reynolds' contributions was the equestrian portrait of Lord Ligonier, now in the National Gallery at Marlborough House. This work shows that Sir Joshua had not nearly attained his ultimate excellence, nor even then established that florid style for which he is now especially distinguished.

An extract from a letter of his friend, Dr. Johnson, will give a sufficient idea of his success so early as 1762, before his fortieth year: "Mr. Reynolds gets 6000*l.* a-year." In 1768, when the Royal Academy was founded, Reynolds was

unanimously elected President, and he was then knighted by George III. The Academy was opened January 1st, 1769, when Sir Joshua pronounced the first of those fifteen discourses which have given him a reputation as a critic and writer on Art little inferior to that which he holds as a painter; and it would be unjust to Sir Joshua to consider him a mere portrait-painter. Some of his poetic or historical pieces, of which he executed several, are works of great power and imagination, as his "Count Ugolino and his Sons starved in Prison," from Dante, painted in 1773: this picture was purchased by the Duke of Dorset for 400 guineas: there is a good print of it by Dixon. Four hundred guineas were a considerable price to pay for a small fancy picture at that time, and this was remarked to his Grace: "Very true," he replied, "but the picture affords me so much more pleasure than the money would, that I do not know how it could be better applied." In this year he was highly gratified by two very different honorary distinctions which were conferred upon him: he was created Doctor of Civil Law by the University of Oxford, and elected mayor of his native place, Plympton. In 1779, Sir Joshua raised his price for a head to fifty guineas; this remained his final price. In 1780, and following years, he was occupied in preparing his designs for the great window of New College Chapel, Oxford, painted on the glass by Jervis of Dublin. The principal subject for the window is the Nativity, the original design of which was purchased by the Duke of Rutland for 1200 guineas, but it was unfortunately burnt in the fire at Belvoir Castle in 1816. The seven compartments below the Nativity are occupied with allegorical figures of the four cardinal, and the three Christian virtues—Temperance, Fortitude, Justice, and Prudence, Faith, Hope, and Charity. There is a print of the Nativity by Earlom.

In 1784 Sir Joshua painted his magnificent picture of

Mrs. Siddons as "The Tragic Muse," more fully described above. And in this year (December 13th), he lost his friend Johnson, who bequeathed to the painter his own corrected folio copy of his English Dictionary. A short time before his death Johnson made three requests of Sir Joshua—that he would forgive him 30*l.* he owed him; that he would often read the Bible; and that he would not paint on Sundays. To all of which Sir Joshua cheerfully assented.

In 1786, he painted his Infant Hercules for the Empress Catherine of Russia, who, in a letter to the Russian Ambassador, Count Woronzow, in 1790, after the arrival of the picture, with a French and an English copy of the "Discourses," says, "I have read with the greatest avidity those Discourses by Sir Joshua Reynolds, which that illustrious artist sent me with his large picture; in both productions one may easily trace a most elevated genius." With the letter was sent a gold box with a medallion portrait of the Empress. For this picture, considered his greatest historical work, Sir Joshua's executors received 1500 guineas. Even his usual depreciator Barry approved of it; yet it had been a singular example of Sir Joshua's indecision of aim and method; for when he parted with it, says Northcote, he observed to a friend, "There are ten pictures under it, some better, some worse." There are prints of it by Hodges and by Walker. It is of the Rembrandt school in effect, extremely rich in colour. Hodges, the landscape-painter, said it looked as if it had been "boiled in brandy."

Sir Joshua executed also three historical works for Alderman Boydell's Shakspeare—the Cauldron Scene in Macbeth, for which he received 1000 guineas; the Death of Cardinal Beaufort, of which the sketch is now at Dulwich, 500 guineas; and a small picture of Puck in Midsummer Night's Dream, in Mr. Rogers's collection, 100 guineas. These were among Sir Joshua's last works. He

died of a disease of the liver February 23d, 1792. His body, after lying in state in Somerset House, was buried with great pomp in St. Paul's Cathedral, where a statue by Flaxman was some years afterwards erected to his memory. The day after his death his eulogium from the pen of Burke appeared in the public prints, containing some high and merited compliments to both Sir Joshua's great professional attainments and social virtues. "He was," writes Burke, "on very many accounts one of the most memorable men of his time. He was the first Englishman who added the praise of the elegant arts to the other glories of his country. In taste, in grace, in facility, in happy invention, and in the richness and harmony of colouring, he was equal to the greatest masters of the renowned ages." "His social virtues in all the relations and all the habitudes of life, rendered him the centre of a very great and unparalleled variety of agreeable societies, which will be dissipated by his death." "The loss of no man of his time can be felt with more sincere general and unmixed sorrow."

In his busy life of almost unparalleled success, Sir Joshua Reynolds necessarily accumulated a large fortune. His works are extremely numerous, and were well paid; even his engraved pictures amount to upwards of 700. He left in all about 80,000*l.*, the principal portion of which went to his niece, Miss Palmer, afterwards Marchioness of Thomond. His collections alone sold for 17,000*l.* He was never married. Sir Joshua Reynolds has left few literary labours besides his fifteen "Discourses" delivered at the biennial distribution of medals at the Royal Academy, and of which there is a magnificent illustrated edition by John Burnet. Of his other contributions, his "Notes on his Tour through Flanders and Holland in 1781," is the most important.

The partiality of British criticism has, with some few

exceptions, awarded Sir Joshua unqualified praise. "To the grandeur, the truth, and simplicity of Titian," says his pupil and biographer, Northcote, "and to the daring strength of Rembrandt, he has united the chasteness and delicacy of Vandyck." This is the opinion of a devoted admirer. Sir Joshua certainly struck out a new path in portrait, and by uniting graceful composition and breadth of light and shade with a rich and mellow tone of colouring, established a novel and rich style, well calculated to attract and captivate the taste of a public accustomed only to the dry productions of a Kneller or a Jervas. It is, however, not without much justice that the style of Reynolds has been termed superficial and alluring. His principal object was *effect*, depending on colour, and light and shade. His principle was, that the likeness and individual character depended more upon the "general effect," than upon the exact expression of the peculiarities, or minute discrimination of the parts. To this generally dangerous principle may be traced the characteristic defects of his own works, of which the "Holy Family," in the National Gallery at Marlborough House, is a remarkable specimen—a mere general florid effect, without intellectual character, and wholly wanting in drawing or modelling—in other words, precision of parts. The forms are merely indicated, not expressed, and the execution is exceedingly loose, the composition having much more the effect of a large, careless sketch, than that of a finished picture. Sir Joshua's great fear of falling into "the vulgar error," as he has termed it, "of imitating nature too closely," and while aiming at individuality attaining only "littleness," led him into the opposite extreme of acquiring breadth at the expense of nature, by an almost total neglect of *modelling*, or drawing in its strictest sense. And this was the rule, not the exception, of his practice in all the later years of his remarkable career. And through his great influence upon his immediate followers, these individual defects specified, became, and have

been, the distinctive characteristics with the painters of the British school for more than half a century. Now, however, happily, a better system is being rapidly established.

It may have been observed that Sir Joshua's historical efforts belong to the latter part of his life. It is a fact that has been remarked by his biographer, Northcote, that Sir Joshua was neglected as a portrait-painter when Romney grew into fashion. Difference of price cannot have been the cause of this, for Romney's prices were also high, though less than Sir Joshua's. Romney was, however, distinguished for fine and powerful drawing, and his best efforts contrasting with the exceedingly careless portraits of Reynolds's later years, though full of that peculiar power which distinguished him, may have legitimately caused a decline of the public favour on the part of Sir Joshua. Lord Thurlow is reported to have said, "Reynolds and Romney divide the town; I am of the Romney faction." The influence of Romney was, however, but a transitory fashion, while Reynolds, on the other hand, became the idol of posterity. And we may congratulate ourselves on this rivalry if we owe to it the greater share of his time which Sir Joshua gave to historical painting towards the end of his career; for though prominently displaying all his defects of style, no number of his ordinary portraits would replace their loss; and while bad as examples for the aspiring student, as specimens of an original and individual genius they are works of great interest. "The Tragic Muse" alone is sufficient to immortalise his name as a great painter, realising the charming compliment he paid to the great actress: when the latter, on inspecting her finished portrait, remarked on Sir Joshua's name written on the border of her dress, he replied, "I could not lose the honour this opportunity afforded me, of going down to posterity on the hem of your garment."

R. N. W.

LIFE, IN ITS HIGHER FORMS.

No. I.

FISHES.

IN passing from one country to another, we do not find any boundary lines in nature corresponding to those which we see upon our maps. There may be a gradual change of features, indeed; as the vegetation that characterises Spain differs from that of France, and this latter from that of Prussia; but the traveller is not conscious of any abrupt change; the last mile of his journey on one side of either frontier being pretty much the same as the first mile beyond it. We speak, too, of the various ranks and classes of society: the labourer, the artisan, the tradesman, the manufacturer, the merchant, the professional man, the scientific man, the statesman, the peer, the prince, the sovereign; but the homes, the raiment, the manners of these, though characterised by well-marked diversities and peculiarities, are not separated by broad lines of demarcation, but pass imperceptibly into each other. The diversities exist in nature, but the boundary lines are arbitrary.

So it is in Natural History. The student will do well to bear in mind continually that those subdivisions of organic beings which we call Classes, Orders, Families, and Genera, are but convenient aids for recording and remembering facts. There is but one division which exists in nature,—that of Species. Each Species is separated from every other Species by an impassable boundary (whether we can in all cases determine it practically or not). It was originally created distinct, and distinct it remains. But the group of Species which

we call a Genus is a merely arbitrary collocation ; convenient, indeed, as we before said, and to a certain extent natural, inasmuch as it is a formula for expressing the community of certain characters ; but still arbitrary, inasmuch as it might be made more or less extensive, according to the pleasure of the naturalist who chooses the characters on which it is made to rest. And so of all the higher groups.

The great division of animal existences which we propose now to consider presents peculiarities of structure and function, which we can seize and identify with great precision when we look at it as a whole. But if we examine the points of contact between it and the great groups we have dismissed, we find these broadly-marked distinctions becoming evanescent, and melting into those of the conterminous phalanx.

One grand distinction of the higher animals is commemorated in the title by which they are generally known,—VERTEBRATA. They possess an internal *skeleton* composed of many pieces, and formed of a substance, which is not deposited layer by layer like the shells of MOLLUSCA, but is capable of growth in the manner of fleshy tissues, being permeated both by blood-vessels and nerves, and undergoing a perpetual change in its component atoms. In its simplest form this substance is flexible and elastic, and is called *cartilage*; but by the addition, in various degrees, of the calcareous element, it becomes hard, solid, and inflexible, and we call it *bone*.

Now, as in the highest forms among the MOLLUSCA we saw the external skeleton of shell gradually vanishing, and traces of an internal skeleton of cartilage appearing, (as the cranial ring, or skull, and the fin-plates, of the Cuttle-fishes)—so in the most rudimentary of the FISHES, as the Lamprey, and that curious creature the Sea-hag (*Myxine*), and, more markedly still, in the dubious Lancelet (*Amphi-*

oxus), the spinal column, instead of forming a series of distinct bones, is an undivided rod of cartilage; in the latter two instances horny, flexible, and bearing the closest resemblance to the "pen" of the common Squid.

Perhaps it will be well to examine the nature of this distinctive *skeleton* as we find it in its normal development. Its most important element is the *spinal column*, which consists of a linear series of pieces attached to each other, and running longitudinally through the animal. These pieces are called *vertebræ*. The best way to study a *vertebra* is to take that of a fish,—one of the joints from the backbone of a Cod for example, since in this class we find it most simply and yet most perfectly developed. We thus perceive that it is composed of several parts. 1. The *central cylinder*; 2. the *superior arch*, formed by two sloping side pieces, between which the spinal marrow passes; 3. the *superior spinous process*, projecting upward from the union of these pieces; 4. the two *lateral processes*; 5. the *inferior arch*, formed as the superior is, protecting great blood-vessels; 6. the *inferior spinous process*, pointing downward.

A number of the *vertebræ* at the fore part of the column are so far modified in shape and proportion of parts as to be identified only by close study and comparison. They constitute the *skull*, a capacious chamber of bone formed to contain the *brain*, which is but the aggregation of several pairs of *ganglia* greatly developed.

In front of these bones there is placed another series, arranged in pairs, constituting the *face*; some of these are excavated into cavities to protect the organs of sense and others form the jaws, &c.

These may all be considered as integral parts of the vertebral column; but besides these, there are important accessories yet to be noticed. First, there are a number of slender bones, which are articulated to the transverse pro-

cesses of the *vertebræ*, and arch outwards and downwards. They form two series: 1. The hyoid arches, which spring from the skull; these are minute in the human skeleton: but in some animals, especially in fishes, they are large and important, forming the great framework which carries the gills. 2. The ribs, which are in general developed in a ratio inverse to that of the hyoid arches. Secondly, we find two pairs of *limbs*, each consisting of several pieces articulated to each other, and free at one extremity, while the other is jointed to the *spinal column*, or suspended in the muscles of the body.

Such is a brief enumeration of the essential parts of an internal skeleton, which, when examined in detail, with intelligence of the purpose which every part is intended to subserve, forms one of the noblest monuments of the wisdom of God that can be found in creation. It must be observed, however, that the various portions are seen in various degrees of development in different classes of animals, and that some of the constituents are occasionally either very rudimentary or entirely wanting.

Not less important in the economy of a vertebrate animal is the condition of the *nervous system*. To this, indeed, the *skeleton* is ancillary. There is a great concentration of nervous matter in the fore part of the animal, constituting the *brain*, whence cords are given forth to the organs of sense, which are mostly situated in the vicinity. From its hinder part proceeds the *spinal marrow*, running along a tube formed by the *superior arches* of the *vertebræ*, and giving off a number of threads on each side in symmetrical pairs. The spinal marrow itself is not homogeneous, but is composed of four cords fused together, of which the upper pair is destined to convey the commands of the will to the voluntary muscles, while the lower pair receives the sensations which are conveyed from without. Hence, they are

respectively termed the *motor* and the *sensitive* tracts of the spinal cord.

In like manner every lateral nerve is double, arising by two distinct roots, the one from the *motor*, the other from the *sensitive* tract.

Besides these, there are series of nerves, extensively ramified, which do not originate from either *brain* or *spinal column*, but from scattered *ganglia* situated in various parts of the body, and destined to supply those important organs whose motions are independent of the will, and which are therefore distinguished as the organic or vegetative system.

The blood is, in every case, composed of red globules or disks, suspended in a watery fluid. It circulates through two series of vessels, which ramify to every part of the body. The one series,—that of the *veins*,—receives the assimilated nutriment from the digestive system, and conveys the blood, so reinforced, but exhausted of its oxygen, to the heart, a great muscular chamber, which alternately contracts and expands without intermission. By these movements, the contained volume of blood is urged forward, in whole or in part, to the lungs, or (in such animals as are aquatic) to the gills, where it is brought into proximity with fresh oxygen, either from the inhaled air or water. This element readily combines with the blood through the inconceivably attenuated coats of the vessels, and revivifies it, restoring at once its brilliant red hue. Thus renewed, the vital fluid is returned to the heart, whence it is forced into the other series of vessels called *arteries*, which carry it forward to all parts of the body, and at length, uniting with the *veins* by excessively minute tubes called *capillaries*, situated at the circumference, and having built up the whole structure of the living temple in its course, takes its return journey as we at first described it.

The lowest Class of the great Vertebrate Division, is

that of FISHES. They are distinguished by the simplicity of their outline, by their respiring by gills instead of lungs, by the enormous development of their hyoid apparatus, by their cold blood, by the modification of their limbs into fins, and by the possession of accessory organs of the same kind, especially the tail-fin, which is their grand instrument of locomotion. All these characteristics are, more or less obviously, dependent on the great fact of their aquatic life.

We have already adverted to the existence among the MOLLUSCA of the rudiments of an internal skeleton, by which that great division overlaps, so to speak, the present. On the other hand, we find in most FISHES remnants of the external skeleton neither few nor unimportant, by which they manifest their affinity with the creatures below them. The scales of the majority of fishes, the bony plates which we see in the Trunk-fish (*Ostracion*) and in the "Tittlebat," which every truant schoolboy knows, the recurved spinous tubercles with which the Thornback's skin is studded, and the opercular bones, or plates that cover the gills,—what are all these but portions of an external skeleton, in no way belonging to that series of bones which belongs to the fish as a vertebrate animal? The rays of the fins which are not limbs (as the *dorsal*, the *anal*, and the *caudal*), and the blade-like bones penetrating the flesh to which these are jointed, must also come into the same category.

The scales which form the covering of most fishes are highly instructive objects. "Examined separately," says Professor Jones, "each scale is found to be partially embedded in a minute fold of the living and vascular cutis, to which its under surface is adherent. Every scale is, in fact, made up of superimposed laminæ of horny matter secreted by the cutis, precisely in the same way as the shelly cover-

ing of a mollusc; and by maceration the different layers may readily be separated, the smallest and most superficial being of course the first formed, while the largest and most recent are those nearest to the surface of the living skin: as far as relates to the mode of growth, therefore, there is the strictest analogy between the scale of a fish and a shell. Various are the forms under which these scales present themselves to the ichthyologist; sometimes, as in the Eel, they are thinly scattered over the surface of a thick and slimy cutis; more generally they form a close and compact imbricated mail; in the Pipe-fishes (*Syngnathidæ*), the whole body is covered with a strong armour composed of broad and thick calcareous plates: and in the Coffin-fishes (*Ostracionidæ*) the integument is converted into a strong box made up of polygonal pieces ankylosed together, so that the tail and the fins alone remain moveable.”*

The bones which compose the proper skeleton have little density or hardness in any fishes; and in one large subdivision—that containing the Sturgeons, Sharks, and Skates—they are wholly composed of cartilage. In the latter, which, in this, as well as some other respects, are the lowest forms in the Class, we find, however, analogies and peculiarities which raise them above the highest.

Teeth, which are so characteristic of VERTEBRATA, are nowhere found in such variety of form and function as among FISHES. They are not confined to the jaws, but are found by turns in almost every one of the bones that compose the mouth, though not in all species. They are generally simple spines, curved backwards; but innumerable modifications of this form occur. Thus the jaws of the deadly Shark are flat and lancet-like, the cutting edges being notched like a saw; the front teeth of the Plaice and the Flounder are compressed plates; some, as the Wrasse, have flat

* “Gen. Outline,” p. 506.

grinding teeth ; others, as the Sheep's-head, have the grinding surface convex ; and others, as the genus *Chrysophrys*, have convex teeth so numerous and so closely packed over a broad surface, as to resemble the paving-stones of a street. The beautiful *Chaetodons* of warm climates, on the other hand, have teeth which resemble bristles, and these are set close together like the hairs of a brush ; while the Perch of our own rivers has them still more slender, minute, and numerous, so as to resemble the pile of velvet. Another of our well-known fishes, the bold and fierce Pike, is armed with teeth scarcely less formidable in size, form, and sharpness, than the canines of a carnivorous quadruped. In number, also, there is a great variety. The Pike, the Perch, the Catfish, and many others, have the mouth crowded with innumerable teeth, while the Carp and the Roach have only a few strong teeth in the throat, and a single flat one above ; and the Sturgeon, the Pipe-fish, and the Sandlaunce, are entirely toothless.

The eye in this Class presents a beautiful example of adaptation to the medium in which they live. From the density of water being so nearly the same as that of the aqueous and vitreous humours, these have scarcely any power to refract the rays of light ; and hence a high magnifying power is given to the crystalline lens. Its form is that to which the very highest possible power is assigned—a perfect sphere, and the density of its texture is very great. But as the power of a lens and the nearness of its focal point are in the same ratio, it was needful to bring the *retina*, or curtain on which the image is painted, very close to the lens ; and this is done by diminishing the vitreous humour behind it, and thus flattening the sphere ; while a provision is made for maintaining this shape in certain plates of bone or cartilage, imbedded in the tough coat of the eye, called the *sclerotica*.

The eye is never protected by an eyelid in fishes ; the pupil is very large and incapable of contraction ; and another peculiarity is, that (at least in many species), the one eye is moved independently of the other.

The last organ we have space to notice at present is the air-bladder, which is found in most of the bony fishes. It is usually of a lengthened form, attached beneath the spine ; but its shape is subject to some variety. Thus, in the Hedgehog fishes it is two-lobed, like a Dutchman's breeches ; sometimes it is a double sac ; in the great Carp family, and in the Electric Eels, it is divided into two compartments by a transverse partition, which, in the former case, is perforated to allow an intercommunication. In one of the Cat-fishes (*Pangasius*), it is divided into four compartments, and in others into many irregular cells. Thus, the air-bladder closely approaches in structure the lowest form of the *lung* in air-breathing VERTEBRATA, as in the Axolotl and the Newts, in which this organ is a simple bladder, and in the Frogs and Toads, in which it is subdivided into large cells ; and it may, therefore, be considered as the first rudimentary appearance of an ærial respiratory apparatus.

With regard to its function, in Fishes, it appears primarily to be connected with swimming. Being condensed by muscular pressure, or allowed to expand, it renders the body either heavier or lighter ; and thus enables the fish to swim at any height in the water according to its pleasure. In general, the roving and surface-swimming species are furnished with the organ in question, while such as haunt the bottom are destitute of it ; and this arrangement well agrees with the function we have ascribed to it. Yet it cannot be denied that there are some most unaccountable deviations from this rule. Thus, the Gurnards, which are ground-fishes, are well furnished with bladders ; the two British species of Surmullet are deprived of the organ ;

while the Tropical species, which have the same habits, are provided with one. Again, of surface-fishes, our common Mackerel has no bladder, while the Spanish and Coly Mackerels, which have exactly the same manners, are each furnished with one.

In many cases the bladder is hermetically sealed, but in some instances it communicates by a tube with the stomach, or the gullet. The air which it contains appears to be a secreted gas ; it is found to be, in some cases, oxygen, and in others, strange to say, nearly pure nitrogen. The former gas occurs chiefly in species that live in very deep water.

The blood, as already observed, is cold ; that is, it commonly takes the temperature of the surrounding water ; in some of the swift oceanic Fishes of the Mackerel family, however, such as the Tunny and the Bonito, the blood is found to be 10° higher than the temperature of the surface of the sea, even within the Tropics : the flesh of these Fishes is dark and dense. The blood-disks are sometimes circular, sometimes oval. They are larger than those of MAMMALIA and BIRDS ; smaller than those of REPTILES, and especially than those of AMPHIBIA.

The irritability of the muscular fibre is considerable, and is long retained. Fishmongers take advantage of this property, to produce rigid muscular contraction, after life has ceased, by transverse cuts and immersion of the muscles in cold water : by this operation, which is called "crimping," the firmness and density of the muscular tissue are increased.

In our next paper, we may enter into some details of the instincts and habits of Fishes, and some other matters connected with the Class, of more popular interest than these structural peculiarities, which, we fear, will prove but a dry morsel to many of our readers.

P. H. G.

CAPTAIN WILLIAM COOK.

WILLIAM COOK was born at Greenock about the year 1788. His father commanded a vessel of his own, but died whilst his son was little more than an infant. The sailor's widow gave her little boy such schooling as her means could afford; and at ten years of age he left home for good and went to sea, and by the time he was thirteen years old his earnings were the chief support of his mother and two sisters. His mother had made him get by heart the Shorter Catechism with the Scripture proofs; and this, together with a certain influence from her own exhortations, he regarded as his chief preservative from evil. For although he was in some respects no better than other lads, he could never forget the Catechism and the Bible texts; and they, at least, kept him from drinking and the grosser immoralities. He was an excellent seaman. More especially he was remarkable for cool bravery and daring. As he once told us, "I never knew fear. I heard people speak about being nervous, but I did not understand the feeling. Still it was only stoicism—a dogged contempt of death and danger; it was not the courage of a Christian." He had his own share of adventures. Whilst mate of a merchant vessel he fell into the hands of a press-gang, and served for two years and a half on board a man-of-war; and afterwards, whilst commanding a trader in the China Seas, he was taken by pirates, and made a narrow escape from being murdered on the spot. But probably his name would never have emerged above the level of the many intrepid and self-sacrificing men who conduct across the deep the wealth of England, had it not been for an incident that awakened much attention at the time, and of which the remembrance ought not to perish.

In the end of February 1825, after being long detained by contrary winds, Captain Cook sailed away from Falmouth in command of the *Cambria*, a small vessel of 200 tons burden, with thirty-six miners on board, whom he was conveying to Vera Cruz. On the morning of the 1st of March he was overtaken by stormy weather in the Bay of Biscay, and was driven considerably out of his course. Whilst jogging on impatiently in a track which he was anxious to quit, he saw a large vessel bearing towards him under press of sail. At first he took little notice; but observing signals of distress flying at each mast-head, he hastened to render assistance. On drawing near he perceived that she had troops on board; and he saw what could not be fewer than five or six hundred persons crowded in the rigging and all along the hammock nettings. But it was not till within half-a-mile that, crossing her bows in order to take up a position to leeward, Captain Cook discovered thick volumes of smoke issuing from her ports, and saw too plainly that the stranger was on fire.

A boat soon came on board, and told him that this was the *Kent* East-Indiaman; that she had been burning for the last five hours; that the fire must now be near the powder-magazine; that she had on board from six to seven hundred souls; and Captain Cook was asked how many of this number he could receive. "All! all!" was the instant answer of a British tar. But the rescue was attended with enormous difficulties. The guns of the merchant-warrior were loaded and shotted; and as the fire approached, they would discharge themselves to the imminent danger of the friendly deliverer. And, what was a much more fearful peril, there were 500 barrels of gunpowder, which any moment might scatter the mighty ship on the seething waters like the fragments of a filbert-shell. But Captain Cook sailed close up under the burning vessel's stern; and,

in concert with the commander of the *Kent*, at once completed his arrangements. From the stern of a ship there projects a horizontal beam called the spanker-boom. To ordinary people in the calmest weather it would be dizzy work to creep out along that slippery timber and look down from a height of twenty feet; but on this occasion the sea ran mountains high, and for most of those who wished to escape, it was needful to find their way to the farthest extremity of this giddy path, whilst the ship was rising and plunging in the storm; and then, when he reached the end of this beam, the soldier, or whoever he might be, had to lower himself from his sickening elevation by a rope, so as to catch the boat which was hovering to and fro on the billows beneath. And fortunate was he if he dropped into it at once; for if, as often happened, the boat was swept away by the swell before it could return, the poor fellow was buried deep under the water, and then found himself drawn up to dangle high in air. And it was only after many a trial and many a miss that some at last flung themselves bruised and dripping into the ark of refuge. And others, their courage entirely failed. They advanced a little way along the spanker-boom, and then, when they looked down into the boiling surge, they could only lie close and hug the timber; and as there they clung, with blanched cheeks and clammy hands, refusing to proceed, and obstructing others, they died many deaths in rejecting the means of safety.

It was a fearful scene: for it was the Bay of Biscay, and hundreds of miles from the nearest land. The shades of night had gathered round them; and on board the little *Cambria* hundreds of the saved stood shivering in wet garments in the keen March wind, whilst the great seas burst, and through the broken bulwarks washed ankle-deep along the deck. And with his drawn sword, the captain stood at

the vessel's side, receiving fresh cargoes of the rescued, and driving back the reluctant and exhausted sailors in quest of more. And yonder, at a cable's distance, amid the howling of the tempest, amidst the crackle of the flames and the crash of timbers, like a floating volcano, or like Behemoth in a bonfire, leaped and laboured the mighty ship in her fiery throes. And there could be seen the idle lines down which no more of the panic-stricken remnant could be induced to drop, and under them the one lingering boat which vainly urged the venture. And now, after a five hours' grapple with destruction—a fierce and fearful combat with wind, fire, and water—the Cambria is forced to quit. Five hundred and fifty-seven immortal beings has she snatched from the jaws of death; and many has been the shriek of ecstasy as the successive boats came alongside and restored to the embrace of frantic wives and children husbands and fathers who were given up for lost. But now no more can be done, and slowly the brig drops away. At a little distance she sees the devouring element sweep over the upper deck, and like lightning rush up the masts and the rigging. In the conflagration the heavens are lighted up; and for awhile the flags of distress, which had been hoisted in the morning, keep waving amid the flames. At last, one after one, “like stately steeples,” the masts fall overboard. And there it comes! The magazine is reached, and in blazing rockets the exploded castle goes up into the firmament; and by the time the roar has reached the Cambria, the fiery shower has rained back into the surge, and all is quenched, and dark, and desolate.

After this, the Cambria made speed for a place of safety. A cabin intended for eight or ten was packed with eighty occupants, and so densely peopled were the decks, that at no one time could a half lie down. There was food on board sufficient for ten days; but to work the ship amidst such a crowd was an arduous problem, and to six hundred

human beings, wet and miserable and crammed together, a protracted voyage would have been a dire calamity. But the breeze was fair for Falmouth; and, after a rapid run of eight-and-forty hours, the *Cambria* was off the harbour, and, by an opportune veer of the wind, she was enabled to enter at once. But as soon as she was safely within, and whilst the seamen were still handing the sails, the wind went round to the north-east, and they shuddered to think that if they had arrived a little later, they might all have been blown back to sea.*

In every such deliverance many providences converge.

* See "The Kent and the *Cambria*," in "True Tales for Spare Hours," which was compiled from information supplied by Captain Cook. Among the rescued was Major (now Major-General Sir Duncan) MacGregor, to whose pen is ascribed the well-known narrative, "The Loss of the Kent." Another of the many valuable lives preserved was Captain (now Lieutenant-colonel) Spence, since so distinguished in the campaign of the *Sutlej*. The first of the passengers of the *Kent* handed on board the *Cambria* was an infant of a few weeks old, the son of Sir Duncan MacGregor, who is now a barrister in London, eminent for his zeal in many a patriotic and Christian enterprise. As is mentioned in "True Tales," owing to the heavy sea and the difficulty of keeping the boat alongside, it was found a very tedious as well as a dangerous operation to transfer the ladies and others from the boat to the brig's deck. To assist in this, Captain Cook had selected the strongest of his men, and placed them in the chains, with breastropes. They reached over as the boat rose with the sea, and received the ladies and others into their brawny arms, from whence they were transferred to others, till landed on deck. From the first boat all were safely got out; others were not so fortunate, for some of the men fell between the boat and the brig, and were killed. "I remember," says Captain Cook, "one poor woman, a soldier's wife, who had her child fastened to her waist. While she was being lifted out of the boat the brig rolled to windward, and the boat fell from under her. The man lifting her had only hold of her two hands, and as she was very stout, it was as much as the man could do to retain his grasp. Whilst thus suspended, the infant slipped out of its fastening, and must have dropped into the sea had not the mother contrived to catch it between her knees, and hold it there till both were rescued."

Without the *Cambria* there was no likelihood that any of the 640 persons shut up in the Kent could have been rescued from their fiery prison; for in all that day of terror, and all the homeward voyage of the *Cambria*, till she reached the Chops of the Channel, not a single sail was sighted. And, in order to bring the two ships together, it was needful that Captain Cook should be kept from weighing anchor for weeks beyond the time intended, and that he should be driven out of his proper course by the storm of that Tuesday morning. In order to effect the rescue, it was needful that the tempest of the morning should have so far abated that row-boats could live and effect the passage from ship to ship; and it was needful that the flames should be kept back from the powder-magazine for an unwonted period. In order to accommodate such an influx of passengers, it was needful that the *Cambria* should be encumbered with no bulky cargo, and that she should be supplied with a good store of provisions,—conditions that were met by her carrying not freight but passengers, and by her having almost intact the rations she had laid-in in port. And in order to make even these provisions last, and to escape the horrors of a pestilence, it was needful that the *Cambria*, with her shattered bulwarks and now-laden hull, should be sped on her homeward way: a condition which was more than met by the double change of wind which wafted her back to Falmouth and dropped her direct into the anchorage of Carril Roads. But it all was arranged by Him who is wonderful in counsel and excellent in working; and, though the deep had opened and sent up from beneath some miraculous asylum, or although the sky had opened and revealed the outstretched arm of Omnipotence, the call to praise God for His goodness could not have been louder, nor could the deliverance have been more truly divine.

Of the share which he had in this rescue, Captain Cook

was seldom disposed to speak. His turn was the reverse of boastful, and he seemed almost oppressed by the importance attached to this incident. The last time we alluded to it, he said, "I was but a poor instrument in the hand of Providence. He could easily have found another. He had no need of me. When I came home on that occasion, I was fêted and petted; but last week, though my bodily suffering was as great as mortal man could bear, I was thinking how much happier I am now than then: for, in those days I had not found out the great source of consolation."

When it was that he made this great discovery, we cannot tell, nor could he tell the exact time himself. But during his latter years, the excellent of the earth were all his delight, and the house of prayer was his endeared resort. "For two-and-twenty years," he lately remarked, "in choosing a house, I have always taken care to choose it where I could easily get twice a-day to the house of God:" and so much did he love the place that he still would come to it when every movement was agony, and it was a distress to see his pale and death-stricken countenance.

For the last ten months and more he was an invalid, and his suffering was frequently severe. His firm nerves and hardy frame were capable of great endurance; but the helplessness and captivity of the sick-room were a severe trial to his active and independent spirit. To a Christian friend, on his first visit, he said, "For the last three or four years, it has been my prayer, and I believe it was my earnest desire to glorify God; but when this trouble came upon me, I felt as if it was not the way I desired to glorify Him. But it has been teaching me patience and resignation, and I now begin to find that God's way is the right way, and I desire willingly to submit to *His* way." And it was instructive and affecting to see how the sanctifying process went on, till the sturdy, self-reliant nature had become a weaned child.

Another friend who used to visit him two or three times a-week, has favoured us with the following particulars:—

“About the end of last summer, when he began to be confined mostly to the house, his faith assumed a strongly-subjective form ; but while this disturbed his peace, it never led him to cast away his confidence in the Saviour. He was deeply impressed with a sense of God’s love to him in Christ, and often mourned over the coldness of his affections and the hardness of his heart. It sometimes appeared to me that he was disappointed with himself. He seemed anxious to bear, when in the furnace, a much higher and nobler testimony for God ; and when he found himself able only to say, ‘I am the chief of sinners,’ he was cast down and discouraged. ‘How is it,’ he would often exclaim, ‘that I *can* be so cold and unmoved when thinking of His wondrous grace ? I ought to be for ever speaking of His love, and praising Him for all His goodness.’ But sometimes, even at that period, he was able to do this. Calling in the evening to see him, he would sometimes say, ‘This has been a blessed, peaceful day. I have had rest from pain, and my soul has been resting peacefully in Christ. But, oh ! that I could praise and love Him more!’

“During these latter months he had more abiding peace. One Sabbath evening I found him rejoicing : he seemed ‘filled with the Spirit.’ Although in a good deal of bodily suffering, he spoke much, and it was all about the love of God in Christ. He repeated text after text, as well as psalms and hymns, all speaking of redeeming love, which seemed to fill his whole soul—all brought to remembrance by the Holy Spirit the Comforter. As he said, ‘To-night I am lost in wonder at God’s marvellous mercy. My heart is full, and I cannot help speaking of it.’

“One evening, shortly before his death, I found him very prostrate, and able to say very little. I had been speaking of Christ’s finished work, and, although lying in

an apparently almost unconscious state, he said in a clear collected tone, 'Oh! what a sad delusion these poor Catholics are in! to think that a thousand years' suffering, or even ten thousand years, could atone for sin. What a blessing to know the Saviour!'"

Yes, what a blessing to know the Saviour! That knowledge was the blessing of this brave old seaman. His latter days were very lonely; his sufferings were sometimes intense; and his temperament was never impulsive or emotional: but amidst all the outward dreariness and bodily distress, his mind was often filled with a joy unspeakable. "O the condescension of that blessed Saviour!" as he exclaimed one of the last times we saw him;—"Father, I will that they also whom Thou hast given me, be with me where I am, that they may behold my glory, which thou hast given me.' To think that He should wish to share His own Heaven with us sinful worms!' And then he repeated,—

"The Lamb which dwells amidst the throne
Shall o'er them still preside;
Feed them with nourishment divine,
And all their footsteps guide."

This was the theme to which his thoughts seemed to fly spontaneously, and on which he loved to hear others enlarging. "O speak to me of Christ," he would sometimes say to his visitors, when the conversation grew general: "Speak to me of the love of Christ. It is Christian conversation I want."

He died at 4 Bond Street, Pentonville, January 14th, 1856, aged sixty-eight, and his remains are interred in Highgate Cemetery.—At the time of the Niger Expedition, Captain Cook accompanied it as Civil Commissioner; and the last years of his life he filled the post of London agent to the Scottish Equitable Insurance Society. J. H.

FAMILY CONNEXION OF POPULAR FICTIONS.

SOUTHEY says, "Jests and the fictions of Romance and Superstition seem to have travelled everywhere." He was led to make this remark in consequence of a coincidence between a romance in Spanish, a German poem of Wieland, and an old Welsh poem, which all mention the same story.

The following Persian apologue furnishes a fresh instance of this family connexion between the popular stories in different countries, being evidently a variation of the familiar fable of the "Town and Country Mouse."

In former days there was an old woman who lived in a hut as confined as the minds of the ignorant, and as dark as the tombs of misers. Her companion was a cat, from the mirror of whose imagination the appearance of bread had never been reflected, nor had she, from friends or strangers, ever heard its name. It was enough that she now and then scented a mouse, or observed the print of its feet on the floor; and when, blessed by favouring stars and benignant fortune, one fell into her claws, she became like a beggar who discovers a treasure of gold; her cheeks glowed with rapture, and past grief was consumed by present joy. This feast would last for a week or more; and while enjoying it she was wont to exclaim, "Am I, O Allah! when I contemplate this, in a dream or awake? Am I to experience such prosperity after such adversity?"

But the dwelling of the old woman was most usually the mansion of famine, and the cat spent her days in complaint and her nights in those luscious dreams that haunt the sleep of the hunger-stricken. One day, when reduced to extreme weakness, she had, with much labour and difficulty, reached the top of the hut. She observed a cat stalking on the wall

of a neighbour's house, which, like a great tiger, advanced with measured steps, and was so loaded with flesh that she could hardly lift her feet. The old woman's friend was amazed to see one of her own species so fat and sleek, and broke out into exclamations of wonder. "Your stately steps have brought you here at last; pray tell me from whence you come? From whence have you arrived with so lovely an appearance? You look as if from the banquet of the Khan of Chatai. Where have you acquired such a comeliness? and how came you by that glorious strength?"

The other cat replied, "I am the Sultan's Crumb-eater. Each morning when the table is spread, I attend at the palace, and as my address and boldness are great, I cull many a choice morsel from among the rich meats and dainty wheat-cakes. I then retire to pass my time, till the next day dawns, in delightful repose."

The old woman's cat requested to know what rich meat was, and what taste wheat-cakes had. "As for me," she added, in sad and plaintive tone, "during my life I have neither seen nor eaten anything but my old dame's gruel and the flesh of three or four mice." The other smiled and said, "I perceive now why it was that till I drew near I believed you to be a spider. Your lank form is enough to make the whole race of cats blush to acknowledge you as belonging to them. Even now I should not know you to be one of us, but for your ears and your tail. But there might be some hope for you, if you could but get one glimpse of the Sultan's palace, one scent of his delicious viands. You would receive new life; those withered bones, fast retiring behind the curtain of invisibility, would once more come into the open plain of observation. We know that when the perfume of his beloved passes over the tomb of a lover, his dry bones are reanimated."

The old woman's cat now addressed the proud cat of the

Sultan in the most supplicating manner, "Oh, my sister! have I not sacred claims upon you? Are we not linked in the ties of kindred? Will you not give me a proof of friendship by taking me with you when next you visit the palace? Perhaps from your favour plenty may flow to me; and from your patronage, dignity and honour. The wise man has said, 'Withdraw not from the friendship of the honourable; abandon not the support of the elect.'"

The heart of the Sultan's crumb-eater was melted by this pathetic address; she promised that her new friend should accompany her on the next visit to the palace. The latter, overjoyed, went down immediately from the roof and told all to the old woman, who shook her head and said, in a solemn tone, "Be not deceived, my dear friend, with the high-sounding words you have heard. Abandon not your corner of quietness. Be content where you are and with what you have, for the cup of the covetous is only to be filled by the dust of the grave, and the eye of cupidity can only be closed by the needle of mortality and the thread of fate. Remember the words of the sage, 'It is content that makes men rich; mark this, ye avaricious, who traverse the world; he neither knows nor pays adoration to Allah who is dissatisfied with his condition and fortune.'"

But the expected feast had taken such possession of the imagination of poor Puss, that the salutary counsel of the old woman was thrown away; for good advice is like wind in a cage or water in a sieve, when bestowed on the headstrong.

Next day, the half-starved cat hobbled after her new acquaintance to the Sultan's palace; but before the unhappy one came an extraordinary event had occurred, and, as her evil destiny would have it, the water of disappointment was poured on the flame of her hopes. The day before, a whole legion of cats had surrounded the table, and made so much noise that they disturbed the guests, and, in consequence, the

Sultan had ordered that some archers from Tartary should, on the next occasion, be concealed in the room, and that as every cat ate the first morsel he should be shot through with these arrows. The moment the flavour of the viands reached the old woman's cat, she flew like an eagle to the prey ; but scarcely had the weight of a mouthful been placed in the scale to balance her hunger, when a heart-dividing arrow pierced her breast. A stream of blood gushed from the wound ; she fled in dread of death, exclaiming, " Should I escape from this terrific archer, I will be satisfied with my mouse and the miserable hut of my old mistress. Henceforth my soul rejects the honey, if accompanied by the sting. Content and frugal fare are better far than delicate cates and danger."

E. H.

LEAVES FROM THE LINDEN GROVES.

AUTUMN THOUGHTS.

I SAW the forests fade,
 The air was still and grey,
 And o'er my soul dismay'd
 A heavy sadness lay.

Rough Autumn's hand now shed
 Leaves o'er the silent way,
 The joy of Summer fled
 Become the Winter's prey.

The Sun's life-breathing glance
 Forsakes this dying hour ;
 The streams no longer dance,
 Bound by the frost's chill power.

Sudden there sweetly rang
 To me a song so new !
 The transit-bird it sang
 As southward fast it flew.

Like strokes that cause a spring,
 The song sank in me deep ;
 Each note lost joy to bring,
 And cause my heart to leap.

It told of joy forgot,
 Pointed to distant Heaven ;
 Sang, " Soul, forget it not,
 To thee, too, wings are given." GEIBEL.

EARLY TROUBLE.

The Palm's already strong, though but by young leaves graced.
 So once, its youthful strength to try,
 A marble plinth was brought and on it placed,
 And all considered it must crush and die.

But silently shoots up the stem in strength so calm,
 And upward, too, its burden heaves ;
 And now, a stately Heaven-aspiring Palm,
 It bears the stone soft-turbaned in its leaves.

The tree is like a heart where God enshrined dwells.
 Already burdened in its bloom,
 It knows how big sometimes its anguish swells,
 And how 'tis pressed by heavy care and gloom.

But troubles only serve to make it bold and strong.
 Firm Faith can shoulder all its cares,
 And, growing daily stronger, before long
 The heavy cross as ornament it wears. SCHENK.

REVIEW OF THE MONTH.

SELDOM has the announcement of "Peace" been hailed with so little rapture, as when the news reached England on the 17th of January that Russia had accepted the Austrian proposals. We were pleased with our ally; we were not much afraid of our foe; and we were not altogether satisfied with our own achievements. In our wars we have almost learned to reckon on a bungling commencement; but then, we have also become accustomed to a brilliant *finale*; and the public would have liked the Russian war to conclude with the annexation of the Crimea, or the capture of Cronstadt. But even allowing that such decisive successes might have been finally hoped for, it is possible to purchase too dear a dramatic *dénouement*; and every humane and sensible man will be thankful if sufficient concessions can be secured without a further waste of human lives and human happiness. It might be a very good reason why a New Zealand chief should make war, that "his barrel of gunpowder was spoiling;" but England is above the childishness of prolonging a contest for the sake of trying new projectiles, or testing the strength of Mr. Scott Russell's floating batteries. Should the tranquillity of Europe be at this time restored, let us be deeply grateful to Him who is "the Author of Peace and Lover of Concord:" and let us pray that, delivered from a hereditary and disastrous war, the new monarch of Russia may devote himself to the mitigation of serfdom, and to those internal improvements which will do more to illustrate his reign than the erection of a Kremlin in Constantinople.

The friends of the Sabbath are making the most praise-

worthy efforts for the protection of the day of rest, and for the preservation of the rights of the labouring people. For the full success of these, however, we are convinced that nothing will be effectual which does not secure a greater amount of week-day leisure, and which does not on week-days render places of innocent recreation more accessible to the working classes. Were Saturday or Monday afternoon a general holiday, there would be an end to the great excuse for Sabbath desecration. But a suspension of labour without amusement is hardly a holiday. To make it a play-day every museum and picture-gallery should be open, at least as long as daylight lasts; and we are disposed to think, that without material risk to the marble and granite, gas might be introduced in the Egyptian and Elgin saloons. At present the Zoological Gardens and the Polytechnic are open on Monday for six-pence: but to a labouring family with three or four children, half-a-dozen sixpences are a serious sacrifice. We believe that a twopenny admission would "pay," especially in the Panopticon, the Crystal Palace, and the Zoological Gardens, where the accommodation is sufficient for almost any number of visitors; and even if there should at first be a slight shortcoming, it would be well worth the while of the Christian community to make good the deficit as a present from the friends of the Sabbath to their toiling fellow-citizens.

On the 27th of December, Mr. Josiah Conder ended his career of eminent activity and usefulness. For many years he was editor of the "Eclectic Review," and for a still longer period conducted the "Patriot" newspaper. But, perhaps, the most tangible monument of his industry is "The Modern Traveller," a book very different, indeed, from ordinary compilations. In thirty volumes,—clear, vivid, and entertaining,—it gives a historical and topographical survey of nearly the whole extra-European world,

and is a wonderful proof of the freshness and never-flagging versatility of its author's mind. Mr. Conder was a man of public spirit and truly Christian purity of character. His "Literary History of the New Testament" ought to be better known, and his Hymns will long be prized throughout the churches.

Miss Brightwell has given us a second biography of Mrs. Opie, supplying what many felt a desideratum in the former,—her religious history. But we would have preferred the literary and the religious life in one. Under the title, "The Visitor's Book of Texts," Mr. Andrew Bonar has furnished a valuable arrangement of Scripture sayings adapted to the sick and the sorrowful, accompanied with brief but very fruitful notes; and in "Poor Folk at Home," Miss Barber has given a rapid series of faithful and affecting pictures from the real life around us. "The Bush-Boys," by Captain Mayne Reid, is another of those wonderful zoological romances which fascinate old readers as well as young, and which make us completely at home in those wild "karoos" to which John Campbell and Pringle first introduced us. A very beautiful book is "Flowers from many Lands," with its charming coloured plates,—a Christmas offering of the Tract Society. And to those who wish to promote the welfare of their industrious neighbours, we would recommend a very practical and useful tract by Dr. George Wyld, "Health and Comfort: their Attainment and Preservation."

Although it seems strange that such an expedition should have gone forth without an Esquimaux interpreter, the return of the party sent out by the Hudson's Bay Company to search for traces of Sir J. Franklin has sufficiently confirmed the previous year's discovery as to the fate of this gallant seaman and his comrades. Unfortunately, however, no papers have been found, and little has been added to the information previously brought home by Dr. Rae.

NATURE'S LAWS.

THERE are no uncertainties in the great works of creation. To man, looking superficially over Nature, many phenomena may appear irregular and even capricious. To man, examining the physical world with the eye of a philosopher, every phenomenon is observed with a full consciousness that, however mysterious may be the undiscovered causes, it is one of a series of effects in perfect harmony with an unchangeable law.

The wild notes of the Eolian harp varying with the breeze, may appear to many to breathe sweet music in erratic independence of the laws of sound; but, in this instrument, equally with one elaborately constructed, and played upon by the most skilful fingers, a certain number of vibrations of the stretched string produces a fixed note; and if the pulsations are quickened or retarded, if the waves of vibration are rendered longer or shorter, we have at once a different modulation of sound. This example is chosen as being a familiar one, but it may not be the best.

The immense number of errors which are committed through the want of a knowledge of some of the great guiding laws of Nature, serve to convince us that a few pages may be profitably employed in attempting to put the subject in a familiar view. It is necessary that our attention should be limited to a few selected points; it is important that those should be of that character in which the interests of the public are involved, and it will be interesting to seize upon matters which have recently been the subjects of discussion.

Animal power—Heat, as applied to produce Motion—Electricity, as the source of Power and of Light—are, therefore, the subjects of our choice.

There is no more common mistake than that of supposing that POWER can be *produced* without what is virtually an expenditure of matter. Hence we are for ever hearing of projects by which an enormous amount of work is to be done, at scarcely any cost. Under modified forms the dream of perpetual motion is constantly engaging the attention of ingenious but untrained minds. Much valuable time, large sums of money, together with great efforts of thought and vast industry, are thus uselessly expended, all of which would have been saved by a clear perception of the law,—that *man cannot produce power without a change of form in matter somewhere*. Wind and Water are sources of power which man can apply, and Nature supplies him here with a costless Prime Mover. Not so, however, is it with animal, calorific, or electrical powers, to the consideration of which we now advance.

A horse is employed in raising a weight by means of a windlass or whim from a deep mine. We find by experience that it is only possible to “get a certain amount of work out of the animal.” This—the work which he is capable of doing—is called the HORSE POWER. Smeaton estimated that a horse of average strength, working for eight hours a-day, was capable of lifting, during the whole of that period, 22,916lbs. one foot per minute. Messrs. Boulton and Watt subsequently made experiments with the strong brewers’ horses in London, and determined from these trials that 33,000lbs. raised one foot per minute was the value of a horse’s power, and this is the unit of engine-power now adopted. Whether we take the estimate of Smeaton or of Watt, it matters not; horses vary in strength, and we all know that animal strength is exhausted after the continuation of muscular effort for some time. Food and rest are required to effect a restoration of strength. The same remarks apply to human efforts. A man exerts a certain

amount of force for a given time; exhausted, he then seeks food, and usually sleep. In even the smallest muscular effort there is a corresponding waste of muscular matter: this is supplied by a process of assimilation; and if we trace the progress, we advance from muscle to blood, from blood to the fluids of the lacteals, from the lacteals to the contents of the stomach; and thus we find that the man or horse, when labouring, exhausts his food more speedily than when at rest.

Life, although standing in mysterious independence of the ordinary physical forces, is supported by their operations, as carried on in the beautiful machine of the organised being. Heat, electricity, and chemical force, are ever active and necessary for the maintenance of animal health. The processes of digestion and respiration are of a nature to develop these forces. The chemical action constantly going on in the stomach, and in the blood as it passes through the lungs, maintains the due proportion of animal heat, and, doubtless, produces those electrical indications which have sometimes been mistaken for the *Vital Force*.

However, certain it is, that the carbon element of animal food gives the correct equivalent of heat produced, and of strength attainable from either man or horse. A pound of beef or a gallon of corn fairly represents an equivalent of available power. If more than this is exacted, it is obtainable only at the expense of muscle and blood itself: it is like wearing away the metal of the wheels and rods of the steam-engine, after the steam has done its duty. The best economist is he who feeds his horses or his labourers amply. The condition of the animal is in many respects analogous to that of the steam-engine: and, by examining the source of power in it, the whole question will be placed in a clearer light.

Coal or wood is burnt in the furnace of a steam-engine

to vaporise the water which is in the boiler. This steam, by its expansive force, lifts the piston, which turns the crank connected with the wheels which do the work, of whatever kind that work may be.

In the process of respiration the carbon of the blood unites with the oxygen of the air to form carbonic acid, and heat is the result. In the process of vaporisation the carbon of the coal combines with the oxygen of the air during combustion. In both cases the quantity of carbon combining with oxygen is a measure of the heat developed, and the heat developed represents the available power. It will be useful to remember two general facts:—

1. *Under the ordinary atmospheric pressure, a cubic inch of water is by evaporation converted into a cubic foot of steam.*

2. *The mechanical force exerted by the evaporation of a cubic inch of water, would be equal to raising about one ton weight a foot high.*

One pound weight of coal will, theoretically, evaporate 14lbs. of water; but the most perfect results which have been practically obtained have given 10·29lbs. as the quantity of water evaporated by the combustion of a pound of coal, and about 1,000,000lbs. weight have been lifted by this pound of coal one foot high. Notwithstanding this apparently large exertion of force, it is really only $\frac{1}{12}$ th of the force theoretically possible. Such is a brief statement of the mechanical value of heat produced by ordinary combustion, and it fairly represents the mechanical value of the heat produced in animal respiration.

An example may render our meaning more intelligible. A locomotive engine will, by the combustion of a quantity of coal—which we will call 100—move a train, the weight of which shall be designated as 10,000, at the rate of 10 miles in one hour; and in doing this the driving-wheel must per-

form a certain number of revolutions. If the train required to be urged at the rate of 20 miles an hour, the revolutions of the wheels would be proportionally increased, and theoretically double the quantity of coal would have to be used to evaporate the additional supply of steam necessary: in practice this is greatly exceeded.

The chemical equivalent, or proportional number given to carbon, is 6; and in the process of combustion it combines with two equivalents, or 16 of oxygen, to form carbonic acid. Now these 6 grains of carbon represent an exact equivalent of heat, which has been expressed by the number 13,268 in relation to other bodies; and this calorific equivalent is capable of performing an exact amount of *work* (*mechanical power*), and no more.

ELECTRICITY has been proposed as a source of heat, light, and mechanical power. The electricity of the battery—voltaic electricity—is the only form of the force which we can apply. We know that we can, by coiling a quantity of copper wire around a piece of soft iron, convert the iron into a magnet of enormous power. Such magnets may be made to exert the force of tons, either by their attracting or repelling powers, and thus machinery may be moved. Experiments on the largest scale have been made, but none of them have been *economically* successful.

The mechanical force of electricity, however applied, is represented by the chemical change in the voltaic battery, which is, with its metals and its acids, to the electrical engineer, what the furnace and its coals are to the ordinary mechanical engineer.

As the carbon consumed represents the force in one case, so the zinc consumed in the voltaic battery represents the power in the other. The equivalent of carbon we have stated as being 6. The equivalent of zinc is 32.5; in the voltaic process this is converted into oxide of zinc by the

absorption of one equivalent of oxygen, and the mechanical force *theoretically* obtainable from the 32 grains of zinc is exactly that which 6 grains of carbon give us. In practice, however, this is greatly exceeded. By the arrangements of the voltaic battery, it becomes necessary to work with a series of cells, each cell containing a pair of plates of dissimilar metals (say zinc and copper). If we employed ten such pair of plates, the electricity of the last of the series alone is available, the resistances offered to the passage of the power annulling the force generated in the nine, which are, nevertheless, necessary to force out with sufficient intensity the electricity of the last cell of the series, so that ten or more equivalents of zinc, or 320 grains, are required to produce effectively the mechanical equivalent which is due to 32 grains only.

Heat and Light stand in precisely similar positions, and by the electrical battery they are only produced at a cost far exceeding that by which they may be obtained from coal. A certain voltaic battery power produces a given intensity of heat and light, and a certain quantity of oxide of zinc is the result. We desire to convert this back again into zinc, and employ coal to effect this change. The coal required to smelt the oxide of zinc produced, would, if distilled at the gas-works, yield carburetted hydrogen in such abundance, that infinitely more light and heat would be obtained by its combustion, than from the electricity developed during the formation of the oxide of zinc.

Light, heat, electricity, and mechanical power, stand in the same relations to organised or inorganic matter. Each mass of matter, as it is constituted, represents an equivalent of each of these forces; and to produce the effective manifestation of one or the other of these powers, the matter employed must change its form. The law of proportions or chemical equivalents holds good through all the conditions

under which matter has been examined ; and, naming the equivalent numbers by grains,—6 grains of carbon, 8 grains of oxygen, 32 grains of zinc, 28 grains of iron, and to include a few other substances, 16 grains of sulphur, 36 grains of chlorine, and 98 grains of platinum, are exactly equal in their relations to the physical powers which we have been considering.

Nature's laws are singularly exact. The living machine is the most perfect possible. The Great Mechanician has, without difficulty in its construction, effected that which is impossible to man. Yet the laws of the human engine impelled by Life, are the same as those of the locomotive engine impelled by Fire. An equivalent of matter gives its full equivalent of force as muscular power ; but man, with all his endeavours, has not yet arrived at that perfection, which enables him to use the full available force of any of the agents which he compels to minister to his will.

R. H.

DEVOTIONAL WRITERS.

(Concluded.)

NEXT to the writings of Leighton we suppose that the greatest religious impressions have been produced by the writings of Howe ; and those impressions have been deepest upon the highest minds. Passages from both leave long traces behind them, in the soul that is musing upon eternity. But we read them with a still higher aim than producing deep emotion in ourselves. We wish, if it were possible, to assimilate the whole frame of our spirits to theirs, that the griefs and events of time might be met by us in the same temper with which they were received by them. But we feel

how hard it is to reach, even in a small degree, the heights which they have attained, and from which they calmly surveyed the storms of this nether world rolling away in innocuous thunders beneath their feet. The attempt to imitate them, in the first instance, seems almost as vain as the advice of the critics, "If you wish to write good poetry or genuine eloquence, think how Cicero would have expressed himself, or how the verses of Virgil would have flowed." But in religion all things are possible with the Divine help; and the same Divine Teacher that instructed Leighton and Howe is ready to irradiate our minds with the same celestial illuminations.

When we imbibe the spirit of Howe, we seem to stand on the confines of either world; the earth is fast receding, and eternity, in all its immensity, is opening before us. The earth seems as vain and unsubstantial as it appears to the dying eyes; and the all-importance of living near to God, and wholly to God, is forced upon the conviction. As in the Bible, so in the writings of Howe; all things seem hastening to their proper end, and the rudiments both of happiness and misery are fast tending to their full development.

How august in Howe's writings appears the Living Temple of God in the renewed soul of man, with the cloud of God's presence resting upon it, with its blending of gloom and glory! A residence preparing for the inhabitation of the spirit through eternity, and where even the first dim preparations are full of hope and brightness! How deeply does Howe feel the worse than trifling of religious controversy! and how quickly does he perceive the decline of real religion, amid the noisy war of words and pretended zeal for peculiar doctrines! None have felt more deeply the necessity of perpetual revivals. For the inheritance of the Lord, like some of the fairest portions of the East, would

soon be turned into a barren wilderness, were it not for the ever-recurring returns of the evening and morning dew.

With what pleasure would we see in the life of Baxter, as in the lives of the poets, the events of his biography connected with his devotional works! His biography, like his other writings, is indeed somewhat wrong-headed and partial, but a faithful biographer might set that to rights, and represent all the circumstances of his times in the open and equal light of truth. There are many dramatic incidents which would have their due place. Cromwell, for instance, endeavouring to talk Baxter over, with one of those long and interminable harangues which Baxter, who inflicted so many upon others, was least patient of himself; while Lambert, the elegant and the brave, but not the very profound, is indulging by their side in a quiet nap. While the civil war was raging around him, the theological war was equally raging within, and scarce a topic was started which admitted of any doubt, where Baxter did not add a few errors of his own raising. How different the value of his devotional from his controversial works! And how much greater his usefulness and comfort, had he endeavoured to supersede the necessity of controversy by a fuller exposition of the truth!

But the light of the Gospel, which shone so brightly around the first reformers, is much beclouded and perplexed in Baxter's view. None have more earnestly called upon sinners to accept the Gospel, and few evangelical writers have more perplexed the Gospel. Where the foundations are not firmly raised, the edifice must ever be subject occasionally to shake; and the want of clear views is not only a loss to the inquirer who seeks for information in Baxter's writings, but it tended to diminish his own peace, as well as his usefulness to others. His best works were written where he had fewest aids from books. He apologises for the want of learning in works which are still too full of the thorns

and mazes of scholastic ingenuity. How much evil have artificial systems of theology occasioned, which have diverted the mind from the simplicity of the truth, and distracted the attention from the pure word of God to the vain and vexing figments of human ingenuity! In his devotional works Baxter is admirable, when he pleads from the heart to the heart. No works appear better fitted to awaken the conscience and stir up the better feelings of the mind. And numbers will owe to Baxter, as the instrument, their entrance into that rest which he has so nobly described and strongly commended.

Boston, perhaps, has produced the deepest effect upon the religious mind of Scotland in former generations. It is a solemn consideration how the religious preacher or writer imprints on his hearers or readers his own devotional likeness, in its excellences, and, alas! in its defects. When crystallisation is about to take place, it is of great importance that a perfect crystal should be inserted. It is of still greater importance that a perfect and freely-developed character of the truth should be exhibited to disciples, otherwise the image and superscription will be only half represented. Boston's views are most powerful, and his expressions, like the nails that were fastened in the ancient walls, built into them, become part of them so as not to be removed.

No merely human writers seem able to state the whole truth in its complete fulness and exact proportions; and the deficiencies of one must be supplied out of the abundance of another. It is thus that the Spirit is divided in order that all the members may be united; each requiring the aid of others to form one perfect whole. In every masterly picture light and shade must have their due place; the manner in which they are blended is characteristic of the art of the master. In Boston there is much of the bright-

ness of the gospel, but still more of the stern severity of Divine Justice. His dark and Rembrandt-like shades have a solemn effect; but the impression upon the mind is scarcely in complete accordance with the bright rising of the Sun of Righteousness, and the calm and serene fulness of the Gospel Day. The effect of this was still more strongly marked in some of the aged disciples, who had imbibed the distinctive character of Boston's writings, and who, as they approached the verge of eternity, were more marked by seriousness and solemnity than by the bright and cheering dawn of future glory. To take in the full impression of his writings, we must take into account his strong national as well as individual character, the scattered and sequestered population among whom he lived, and the lonely pastoral solitudes, so favourable to musing and melancholy, with which he was surrounded.

Ages may roll on, and nations pass away, but one little work of Boston's will still hold its place in religious estimation. "The Crook in the Lot" will be remembered while the believer remembers and feels that few and evil are his days upon earth, though he may be looking forward in exulting hope to the ages beyond ages of happiness in heaven. Nothing, we think, can be finer than the contrast which he draws between pride and lowly-mindedness:—"Humility is a piece of the image of God; pride is the master-piece of the image of the devil. Let us view Him who is the express image of the Father's person, and we shall behold Him meek and lowly in heart. None more afflicted, yet His spirit perfectly brought down to His lot. That is a shining piece of the Divine image; for though God cannot be low in respect of His state and condition, yet He is of infinite condescension. None bears as He, nor suffers patiently so much contradiction to His will, which is

proposed to us for our encouragement in affliction as it shone in Christ.

“Pride, on the other hand, is the very image of the devil. Will we value ourselves on the height of our spirits? Satan will vie with the highest of us in that point; for though he is the most miserable, yet he is the proudest in the whole creation. There is the greatest distance between his spirit and his lot. The former is as high as the throne of God, the latter as low as hell. And as it is impossible that ever his lot should be brought up to his spirit, so his spirit will never come down to his lot; and therefore he will be eternally at war with his lot.”

In Newton's letters we have religion brought to bear upon every circumstance of life—a delightful picture of daily and hourly Christianity. And though always so simple, so natural and easy, still there is a life and a power accompanying all that he says.

If we examine any of the great writers, and endeavour to estimate the effect they produce upon us—and deduct all the play of fancy, all the depth of emotion, all the force of thought—there remains a residuary power which is yet to be accounted for; the secret, impalpable power of genius, which not only vivifies itself, but communicates its unseen warmth to others. If we may judge from the impression he produces upon us, we think that Newton, in his humble and modest pages, does possess something of this power, though it does not effloresce in fancy, or flash upon us in original thought.

Were we writing a treatise upon Newton's life, we would point out the many and visible providences which attended his early life, when he was forgetful of God, or only a beginner in religion; and mark the decrease of those more manifest interpositions when he was walking more by

faith and in continual resignation of his concerns to the guidance of the word and of the Spirit. We think this contrast might afford some useful, though somewhat difficult, conclusions. By difficult, we mean hard to be understood, like some of the sublimer passages of the Apostle Paul; which are difficult, because involving the largest and most spiritual views of God's proceedings towards those whom he has called to be heirs of his kingdom of glory.

Connected with Newton's letters are some of Cowper's earlier letters addressed to his relative Mrs. Cowper. These contain the clearest views of the gospel of grace. "Marshall," he writes, "is an old acquaintance of mine. I have both read him and heard him read with pleasure and edification. The doctrines he maintains are, under the influence of the Spirit of Christ, the very life of my soul and the soul of all my happiness. That Jesus is a *present* Saviour from the guilt of sin by His most precious blood, and from the power of it, by His Spirit; that corrupt and wretched in ourselves, in Him—and in *Him only*—we are complete; that being united to Jesus by a lively faith, we have a solid and eternal interest in His obedience and sufferings to justify us before the face of our Heavenly Father; and that all this inestimable treasure, the earnest of which is in grace and its consummation in glory, is given, freely *given* to us of God; in short, that He hath opened the kingdom of heaven to *all believers*. These are the truths which, by the grace of God, shall ever be dearer to me than life itself—shall ever be placed next my heart as the throne whereon the Saviour Himself shall sit to sway all its motions, and reduce that world of iniquity and rebellion to a state of filial and affectionate obedience to the will of the Most Holy."

Such is the power of insanity, that, though these truths in the mind of Cowper remained true for all others, they ceased, in his estimation, to be applicable for himself. More

mighty than the Word of God, a supposed new revelation sprung up in his mind that he was to be an exception to that which admitted of no exception—the free and full proclamation of mercy through the Gospel to sinners. All reasoning seems vain in such a case. We have had experience in this ourselves in the case of an aged Christian, who had most full views of the Gospel, but who yet suffered the impressions of his own mind—contrary to his own convictions—contrary to his own writings—to prevail against acknowledged truth; and though conversation and reasoning might for a moment dissipate the darkness, yet the clouds would still return after rain. This mental, and perhaps incurable malady, which suffers a belief in the Gospel to be accompanied by a denial of its applicability to the individual himself, presents, where it is altogether involuntary, a sublime and prolonged martyrdom; where the morbid mind still cleaves to the Saviour without a hope of participating in so great and so free a salvation. But this subject, the mixture of clear views and cloudy impressions, is so natural to the half-renewed mind of man, and so common, that it might require an essay to be adequately treated.

Cowper has made a great addition to our religious poetry. Dr. Johnson says of Watts, “His devotional poetry is, like that of others, unsatisfactory. The paucity of its topics enforces perpetual repetition: and the sanctity of the matter rejects the ornaments of figurative diction.” But the truth is, most devotional poetry is no poetry at all. It is merely theology in rhyme. The writer has had a task to execute, and is happy to have got through it without any egregious failure. Most true poets have not been truly devout, and therefore could not be reasonably expected to produce devotional poetry. Milton and Cowper were devout, and their poetry is devotional also.

The paucity of topics applies to the sublime as well as to the religious. The simple, the enduring, the sublime, must lay hold of the mind by the deep and enduring emotions they excite, not by means of variety. But Johnson's greatest mistake seems to consist in supposing that the sanctity of the matter rejects the ornaments of figurative diction. The Bible is a proof of the contrary. It is at once the most holy and the most figurative of writings. Imagination, as all would allow who understood the structure of the mind, though when misemployed it leads man from heaven, when rightly directed leads man to heaven. It is the necessary attendant and companion to faith. Without imagination man would be of the earth, earthy indeed. But imagination first leads us from the real to the ideal; and from the ideal, if rightly improved, to the celestial.

Were the subject fully examined, we think it would appear that the great difficulty of religious poetry is similar to the difficulty of writing poetry in a foreign language. The seeds of genuine poetry are sown in very early youth, and are only matured by the development of the mental powers. Few are religious when very young; and hence generally religion comes as a stranger and foreigner to the mind. Poetry is an impulse, and religion a restraint; and they are often like two forces acting contrary to each other. But the time will come when all shall know the Lord, from the greatest to the least, from the oldest to the youngest. There will be no need of cutting off one portion of our existence from another; but religious impressions will flow from the springs of early childhood in a continuous stream of the water of life.

The Devotional Writers we have mentioned are not all the springs, but some of the chief fountains, we have drunk of in passing through the vale of Baca. We have drunk of those clear waters; and, refreshed by those cooling

draughts in the midst of a burning wilderness, we have lifted up the head. The praises which Wordsworth bestows upon the poets, justly belong to the devotional writers, "On earth they have made us heirs of truth and pure delights." In the highest sense they have administered their bread to the hungry; they have revived the soul that was ready to perish; they have comforted the mourners, and wiped the tears from many eyes. The peace they felt themselves, they have communicated to many others, and brightened the hopes of eternal glory to many sufferers.

Yet they are but men, and it is right to point out their failings. They are but members of one great body, and the deficiencies of one must be supplied out of the fulness of another. They have also the disadvantage of being highly professional. We know what a strong current in one particular direction the mind of each of the learned professions takes, and what an advantage it would be if a non-professional mind was more frequently introduced into the pursuits of either medicine or law; a fresh eye at once dissolving some prejudices and being apt to perceive some things that had escaped the notice of others. We should greatly desire, therefore, to see more frequent additions to the devotional writers from the ranks of other professions; not only from physicians and lawyers, but from officers of the army and navy, from philosophers and from statesmen. The best commentary upon the Bible is the practical commentary it receives from the lives of its disciples. The greater the variety of circumstances in which these disciples are placed, the greater is the evidence for the inexhaustible resources and variety of wisdom with which the Bible is stored. Every new position will present a new point of view; and a Divine experience will be educed that the Bible is all-sufficient in itself as a rule, and sufficient in itself for all the eventualities of life.

J. D.

CAPE TOWN AND CONSTANTIA.

IN the year 1493, the Cape of Good Hope was discovered, as every one knows, by Bartholomew Diaz ; and four years after, Vasco de Gama immortalised his name by doubling its rocky shores and braving the tempest-tossed seas that guard its approach. For many years the Cape was the temporary resort of civilised man ; and the commanders of outward-bound ships belonging to the Dutch East India Company were accustomed to bury here their despatches for the Directors, cutting at the same time certain signs as directions in the rocks as a guide to those who should make search for the hidden documents. In the year 1650, the Dutch made a permanent settlement, and built the capital of their colony on the spot where Cape Town now stands ; although, thirty years earlier, the agents of the English East India Company had taken formal possession of the country in the name of King James. The Dutch retained possession of the Cape till the year 1795, when, in consequence of the war with France, whose satellite Holland had become, it was seized by the British, but restored by the Treaty of Amiens. At the renewal of the war, however, a British force under Sir David Baird and Sir Home Popham again captured the settlement in 1806 ; and at the peace in 1814 it was formally surrendered to the British Crown.

It was on the afternoon of Monday, the 4th of December, 1854, on board the good ship *Seringapatam*, that we heard the joyful cry of "Land, oh ! land on the starboard bow !" And true enough, there in the dim distance, just like a cloud in the horizon, from which it can scarce be distinguished, land high and mountainous looms into view. Now every eye is strained, and the cry of "Land ! land !"

is re-echoed from bow to stern. On the following day we cast anchor in Table Bay. Colonel Smith and a guard of honour of the 73d regiment were in waiting to escort our distinguished passenger, Sir George Grey, to Government House; the band played "God Save the Queen;" and a royal salute thundered forth to the inhabitants of Cape Town the news of the arrival of their Governor, who bore with him the prestige of popular and successful administration in other colonies. A considerable number of people had assembled at the central jetty to witness his landing; but none of that enthusiasm was exhibited which an event of like importance would certainly have called forth in England. Perhaps the colonists are so used to a change of Governors that they have come to look upon the arrival of a fresh one as a thing of very common occurrence.

Cape Town nestles at the foot of Table Mountain. The latter has much the appearance of some old and gigantic fortress, under the dark frowning battlements of which the city reposes peacefully. The town is built with great regularity, parallel streets intersecting each other at right angles. The houses are, for the most part, plastered and coloured, but seldom more than one story high. Green is a favourite colour for doors and window-sills. The windows are divided into a number of small panes of glass; the rooms are lofty and unceiled—oak, or some dark wood, being substituted for the plaster and whitewash of English apartments; the floors, as in France, are frequently of polished wood. The shops differ little from ordinary houses; there is no attempt at display, and shop-architecture is evidently little thought of, though here and there plate-glass windows may be observed; and the example having been once set, it will probably be speedily followed, although the absence of competition, which in England has at least contributed so much to the beauty of the streets, may act as a retarding

cause. Some of the shops, particularly in the country towns, are called "general stores," and at these everything may be procured. Shop and other announcements are made in English and Dutch; and some of the Cape Town newspapers are published in both languages.

The Cathedral, or St. George's Church, which is situated near the public offices and promenade, is a most unchurch-like building, capable of containing 1000 people. The façade next the street, with its row of columns, resembled very much the entrance to a Pantheon or Town-hall; although, on closer examination, the ball and cross which surmount its ambitious and column-supported spire would perhaps tell its real character. The interior is an oblong parallelogram; the windows are oblong, and divided into small panes of glass; the organ and choir are over the communion-table; and if the pulpit, pews, &c., were removed, the cleared space would make a capital ball-room. The service is not performed in cathedral style, but resembles that of a parish church. There is, however, a good attendance, and I was gratified by hearing an excellent sermon from Dr. Gray, the Bishop. The Dutch Church is a large building, but not worth notice in an architectural point of view. There are also many other churches and chapels in Cape Town.

The Royal Exchange and Public Library are situated on the Grand Parade. They are both noble institutions, and claim the attention of the visitor. In the reading-room of the first-named building are newspapers from all parts of the world, and of every political creed under the sun. Maps of large dimensions, on rollers and in mahogany cases, each bearing the name of the chart within, hang round the room, and can be consulted at pleasure. The Commercial Hall is chiefly devoted to the purposes its name denotes; but it is also used for lectures, public meetings, balls, and concerts.

The Public Library, forming the north-east wing of the

Royal Exchange, contains a splendid collection of books in every department of literature, amounting to nearly 40,000 volumes, and continually increased by new publications from England. On the tables I saw many old friends of familiar name, such as Fraser's, Blackwood's, and Tait's Magazines, "Chambers's Journal," "Household Words," "Punch," and many other periodicals of the day.

The Botanical Garden, situated in Kloof Street, near the Lion's Rump, belongs to Baron Ludwig. Visitors obtain free admission without difficulty. On a hot day in the beginning of December, the first month in the Cape summer, I passed some pleasant hours in this delightful retreat. I found the scarlet pimpernel, so common in English corn-fields, growing wild. There was also a handsome and cultivated variety of the same plant. Edgings of myrtle and roses were in full flower and of great fragrance. The Norfolk Island pine and the blue gum-tree of Australia here grow side by side. There is a good collection of ferns, and some excellent specimens of the date-palm. The prickly pear will not easily be forgotten by the incautious, for the slightest touch will leave in the hand a thousand minute thorns, which so insinuate themselves beneath the skin, as to be very difficult of extraction. On certain days in the week the military band plays for a couple of hours in the Garden, whilst the *beau monde* of Cape Town, both English and Dutch, walk on the velvet lawns, or lounge on the shady seats placed here and there under some leafy canopy.

Close to the Botanical Garden is the Public Promenade, a long and shady avenue of the African oak, which, as far as the leaf is concerned, bears an exact resemblance to its English namesake, but is of more stunted growth. This tree is much cultivated in Cape Town for the sake of its shade, so grateful during the burning days of summer.

Very striking to the stranger is the remarkable mixture

of races so observable in the coloured inhabitants of Cape Town. There is the Malay, with his conical thatched hat, the Hottentot, the Negro, and the innumerable shades and amalgamations of the Creole population.

Not less novel are the large ox-waggon, with their "spans" of twelve or sixteen oxen. The blue veils, twisted round the hats of the gentlemen, and, when necessary, worn over the face as a protection against the clouds of dust raised by the south-east wind, have a picturesque effect. The coloured women wear no bonnets, but take great pains in dressing and adorning their hair. It is turned back from the forehead something in the French style, and stiffened with a preparation they make for the purpose. A large gold or gilt pin is thrust in behind. They generally go with naked feet, wearing only, as a protection, a wooden sandal, which is kept in its place by a projecting piece of iron with a round flat head introduced between the toes.

The purest water from Table Mountain is supplied to the town by iron pipes. The streets are wide and airy, and, though unpaved, are lighted with gas, but the drains are open. No close lanes, however, nor reeking alleys, the abode of squalid want, and vice, and misery, offend the sight. There are two introductions from the mother country very pleasing to the traveller far from home, and which stamp an English character on the city. The first of these is the Police, whose dress and organisation correspond exactly with those of their English brethren; and next, the neat and well-horsed cabs which ply at reasonable fares to every part of the town and neighbourhood. The city is divided into twelve districts, each of which is again subdivided into four wards, the inhabitants of each choosing their own ward-master. The Cape Town district includes nine and a half square miles.

The seasons are the very reverse of those at home, and

are as follows:—September, October, and November, spring; December, January, and February, summer; March, April, and May, autumn; June, July, and August, winter. During the summer months the heat is great, and the peculiar situation of Cape Town, backed towards the south by Table Mountain and open on the north to the full glare of the sun, renders it all the more insupportable; but there is something exhilarating in the pure dry air and the cloudless blue of the summer sky. Green Point, at the back of the Lion's Rump, is a favourite place of residence with the merchants and others, on account of the greater coolness, as well as the salubrity of the air. It is prettily dotted over with handsome villas. When a real south-easter blows, no one in Cape Town, except when absolutely compelled, thinks of stirring out-of-doors owing to the plague of dust that then prevails. If a house be left shut up for a few weeks, the floors will be found covered inches thick with the penetrating dust. The compensation, however, is, that this wind, blowing as it does off the land, is a great purifier, sweeping all noxious effluvia into the sea: hence its name of "the Doctor," by which it is also known.

The early part of December is not a favourable time for fruit, for the oranges are nearly over, and the apricots, peaches, and grapes, are not yet ripe. When in season, they are good, plentiful, and cheap, apricots and peaches being sold for about ninepence the hundred. A Dutchman will think nothing of eating fifty apricots or peaches for his supper.

No one should visit Cape Town without, if possible, climbing the far-famed Table Mountain. It is important, however, to take a guide, or to go with some one well acquainted with the route, for many have lost their way, and, being overtaken by the "table-cloth"-cloud, and so enveloped in thick fog, have perished by cold and hunger,

or been dashed to pieces against the rugged and precipitous rocks, over which a false step would hurry them.

The morning of the 7th of December proved fine at Cape Town, although a slight cloud hung over the mountain; and at five o'clock I started, in company with a gentleman whose kind hospitality I enjoyed during my stay, and two others, our purpose being to spend the day on the mountain-top. About a third of the way up is the Platte Klip Mill, a large grey rock in the bed of the stream; and a little way above this we halted for the black servants, Paul and Mohindee, whose dusky forms were visible in the distance toiling up the steep ascent under a plentiful load of provisions. A fire was soon kindled, and breakfast spread, and, with appetites sharpened by exercise and mountain air, we did full justice to the meal.

In a clear running stream hard by, a number of native women, forming a picturesque group, were washing clothes, for which purpose they ascend thus far once a-week. They dash the linen against the smooth round stones, but do not use a wooden mallet, as is customary in some parts of the Continent of Europe.

Just above this the second, or granite, region of the mountain commences and extends nearly to the entrance of the great kloof, or ravine, which is the only way of ascent from Cape Town. Here, capping the granite, the sandstone again shows itself, and has been estimated to be about 2000 feet in thickness, and the precipitous rocks and cliffs, for which the mountain is so remarkable, are composed of large-grained quartz limestone.

At the kloof the real difficulty of the ascent begins, and the wind now swept down the pass in cold gusts; but, after a due amount of exertion, we gained the summit, and at 11 A.M. we stood on the top of the mountain 3580 feet above the level of the sea. It is a table-land, as the name

denotes, of considerable extent, scattered over with immense blocks of large-grained quartz-sandstone, worn by natural causes of almost unlimited duration into forms as fantastic as the sunset clouds. What object, indeed, is not represented by one or other of these huge relics of the past? Here is an admirable profile of the Duke of Wellington; there are houses, castles, birds, and animals, in mortal combat, yet wrought by no sculptor but old Time, who, age after age, has slowly shaped these ponderous blocks and was busy at his work before man was created on the globe. How recent are the sculptures left us by the nations of antiquity compared with these hoary monuments! Baboons are sometimes met with amongst the rocks, but we did not see any. The flora of Table Mountain is interesting and peculiar. Upon the mountain-side grows the beautiful silver-tree or whitteboom (*Leucodendron argenteum*). The upper surface of the leaf is downy, and has a white silvery appearance, and even when dried it retains its beauty. On the top, amongst the wiry grass, grow numerous varieties of heaths, ferns, lichens, and mosses. In the kloof is found the *Sticta crocata*, a lichen also found in the Falkland Islands. Geraniums, or more properly *Pelargoniums*, are met with in great numbers; also beautiful flowers of the orchis tribe. I found a large and handsome sundew (*Drosera*) growing on the boggy soil; also a pretty little flower very similar to the English *Polygala*, or milkwort. A handsome fern (the *Iodea Africana*) grows amongst the rocks, and a beautiful little ivy-leaved fern. None of the indigenous flowers, however, though beautiful to the eye, have any scent. Indeed, there is a proverb at Cape Town, that "the flowers don't smell, the birds don't sing, and the women don't think;"—but I will not take upon myself to answer for the truth of the last assertion. And here on the mountain-top, how rapidly can the eye take in the bold

features of South African scenery! Sand and rock and mountain, ever-green trees and smiling vineyards, pass in quick review. There lie the ships in Table Bay, looking like nutshells in their littleness. Robben Island, at the entrance of the bay, might be taken for some floating seaweed. To the right stretches out the promontory of Blue Berg, where the English force landed when it took possession of the colony. Cape Town, with its guardian lion on the left, is seen without the intervention of any smoky canopy, and behind the fine sweep of False Bay runs far inland.

The descent from the mountain is more difficult, and requires even more care than the ascent. Through the kloof the loose stones slip from under your feet, rolling before you to the bottom, and the wind sweeping down the ravine propels you forward with more haste than good speed. When we left, the south-east wind, which had been blowing gently all day, increased somewhat in violence, and looking towards Cape Town, the effect of this wind in raising the dust was strikingly visible. A dense cloud of dust hung over the city and swept across the bay. Before we had reached the bottom, the summit of the mountain was enveloped in mist. On the following Sunday, I had an excellent opportunity of seeing that singular phenomenon, the "table-cloth,"—the invariable accompaniment of a south-easter. A dense white cloud lay all along the flat top of the mountain, and pouring over its rocky edge, the vapour descends about a third of the way to the bottom, when it is absorbed by the warmer air of this lower region, and hence becomes invisible. The rest of the sky is perfectly cloudless.

During a south-easter, ships are sometimes driven from their moorings, and at such times exorbitant sums are demanded of those who are compelled to join ships lying in

the bay, in consequence of the great danger of returning to shore in the teeth of such a wind.

A dock, which would be of immense advantage to Table Bay, is talked of. Every facility is afforded for enabling vessels to ascertain the rates of their chronometers; a ball drops from the crosstree of the flag-staff at the Royal Observatory daily (Sundays excepted), at the instant of one o'clock Cape mean solar time, which corresponds to 11^h 46^m 5^s, Greenwich mean solar time. The signal is almost instantly repeated by another ball attached to a lever arm at the Lion's Rump Signal Station. The Observatory ball is visible from the outer anchorage; the Lion's Rump ball is visible from the whole sweep of the bay. Both balls are raised at five minutes before signal nearly, and the interval between the drops is half a second.

Within a pleasant distance of Cape Town, for a morning drive, are the famous vineyards of Constantia. Omnibuses leave Adderley Street nearly every hour for the pretty village of Wynberg, eight miles distant. There is a capital macadamised road all the way, which for miles winds through shady avenues of the African oak,—trees of larger growth than those at Cape Town. Passing two or three villages, we arrive at Wynberg, a charming place of residence for those who like a retired country life. It is a favourite resort of English visitors who come to the Cape to recruit their health. The Dutch church is a conspicuous object, and there is also an English Episcopal chapel. The inn is a comfortable house, where the traveller meets with civility, and, as far as my experience goes, the charges are moderate. Before proceeding to Constantia, we repaired to the police-station, where the Kaffir chief Seyolo, who figured conspicuously in the last war, is detained a prisoner. A more miserable state of existence for a savage, who has

ever been accustomed to the wild freedom of his native haunts, can scarcely be imagined. A small room without furniture, and a court-yard of very limited dimensions, now form the bounds of his habitation. Seyolo, a fine shrewd-looking man, with a cunning twinkle in his keen black eyes, was lying on the floor of his room wrapped up in a blanket, and he did not disdain to accept some tobacco given him by one of the party. He is allowed the company of one of his wives, and the poor child was lying also wrapped up in a blanket in the same apartment, but of course she is not a prisoner. Her devotion to her unfortunate husband in thus voluntarily sharing his captivity is, indeed, touching. There has been some talk of this petty chief being restored to liberty; but he is a great rogue, and also an assassin, and those best acquainted with the character of the Kaffirs say that anything like philanthropy and kindness is quite thrown away upon them, being viewed only as a sign of weakness, and as prompted by fear. Another Kaffir war seems to be looked for by the colonists.

Gladly turning away from this picture of misery, we took the sandy road that leads to Constantia, now about three miles distant. Winding round from the right, the mountains stretch away in the distance, and very fine they looked with the sun shining on their sloping sides and rugged tops. Fir-trees of various species, the silver tree, the curious sugar-bush, pelargoniums, lobelias, many kinds of aloes, and other trees and plants too numerous to mention, here afford an ample field of observation to the lover of the vegetable world. But here we are at the Constantias. There are three estates, called respectively High Constantia, Great Constantia, and Little Constantia. Straight a-head is a large board, with the word "Constantia" painted on it in large characters; and to the left is

also a board indicating the road to the "Original, or Great Constantia." We pursue the road straight on, or rather the path which is shaded with a hedge of oak, and a few minutes' walk brings us to the house of the Messrs. Van Renen. It is prettily situated amidst fine oak, willow, orange, and lemon-trees, which afford a delightful shade, and the vines grow in the fields around. In one of the oak-trees is a capital summer-house. We were met by one of the gentlemen who own the estate, who politely showed us over his cool and spacious stores, and freely offered us the delicious wines for which the locality is famed. Here are seen huge barrels filled with the rich unadulterated juice of the grape. There is the Pontac, a red, and the Frontignac, a white Constantia, both rich, luscious wines, and the same in price, which on the spot is 4*l.* the five-gallon cask. There is also the white Muscadel and the red Muscadel, both just half the price. December, unfortunately, is not the grape season; they are ripe in February, and the wine is made in March. The vines are not trailed, but are about the size of a well-trimmed currant-bush, and are planted in rows three feet apart.

C. T. W.

THE SAFETY-LAMP.

THERE are various kinds of air or gas, having, in most cases, the same *physical* properties as the air we breathe, but all possessing very different *chemical* characters. Thus, taken in a popular sense, some are *inflammable*, or burn when ignited, as *hydrogen gas*; others which do not ignite on the approach of a burning body, yet *support the combustion*, as *oxygen gas*; and, lastly, some are neither inflammable nor support combustion, but *extinguish flame*, as *nitrogen gas*. A mixture of any of the two former classes under certain conditions, when brought into contact with a naked flame, immediately ignites, and produces what we term *an explosion*.

Now, in coal-mines we meet with evolutions of gas of the first and latter classes, which alone would undergo no change in contact with flame; but, in order to support the animal life in these underground works, there must be a large supply of common air. Hence arises the possibility of explosions.

The most common inflammable gas found in mines and elsewhere has been termed *carburetted hydrogen*, and an account of it is recorded as early as 1640 in the "Philosophical Transactions." It is composed of three parts of carbon, and one part of hydrogen. It has neither colour, taste, nor smell, and possesses all the mechanical properties of common air. It takes fire by the application of a lighted candle, and burns with a strong yellow flame, but, providentially, it requires a much higher temperature for ignition than any other gas.

It has long been known to issue from the naphtha springs near the Caspian Sea, and the "holy fires" of Baku are chiefly composed of this gas. It is a very common gas in many salt-mines, being employed to light that of Szlatina in Hungary, and to evaporate the liquor of the salt-pans in the district of Tseu-lieon-tsing in China. A remarkable decrepitating salt, obtained from Wieliczka, encloses a gaseous mixture, composed of

Carburetted hydrogen	..	..	..	84·60
Carbonic acid	..	..	..	2·58
Oxygen	..	..	..	2·00
Nitrogen	..	..	..	10·35
				99·53

It also enters into the composition of the gases which escape from several celebrated springs, viz., in the

Hot-springs of Aachen, to the extent of	·26	—	1·82	per cent.
Sulphur spring of Neundorf	..	..	·17	— 1·46 ,,
Mineral spring of Niederlangenau	..			8·02 ,,
Hercules baths of Orsova	..	..	·38	— 0·88 ,,
Mineral waters of Harrogate	..	..	·52	— 27·71 ,,

Thus, though very generally distributed in those products, liquid and gaseous, which are evolved from the earth, it is chiefly found in coal-mines, where it has received the name of *fire-damp*. It is mixed with various other gases, nitrogen, oxygen, carbonic-acid gas, and common air, besides occasionally hydrogen and olefiant gas.

We can make a very reasonable conjecture as to the formation of these gaseous mixtures by comparing the known composition of wood and coal, the latter being produced from the former by a mouldering process under the influence of water and pressure with a limited supply of air. If we allow the initial letters of carbon, hydrogen, and oxygen, to represent these bodies, and annex the number of the proportions or atoms in which they combine to form

white heat, but igniting instantaneously in contact with flame. An experiment of Davy illustrates this point in a striking manner, for he found he could blow up a charcoal fire to whiteness with an explosive mixture of carburetted hydrogen without danger. Hence no *incandescent* or *red-hot* body will explode such a mixture.

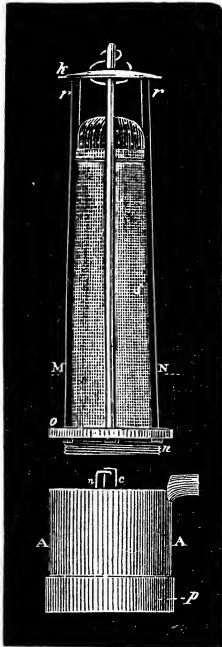
Carburetted hydrogen requiring so high a temperature for ignition, it has been found that the extreme heat cannot be maintained, while the gaseous products pass through tubes of a certain diameter, or wire-gauze of a certain fineness. This fact may be illustrated by any one holding a piece of fine wire-gauze over the flame of a common candle, when the unconsumed gas will pass through without flame, which may be ignited by bringing it in contact with a lighted match.

Lastly, Davy found that, of the following mixtures brought in contact with a lighted taper,—

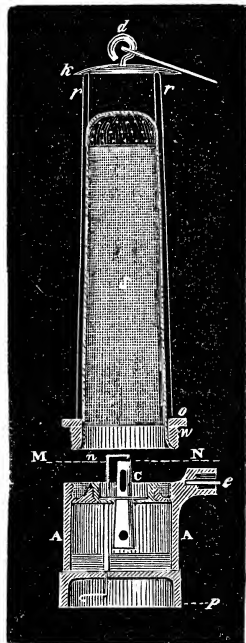
1	vol. of inflam. gas	with 2	vols. of air,	burnt without exploding.
1	„	„	3	„ ditto.
1	„	„	4	„ ditto.
1	„	„	6	„ inflamed with a slight whistling sound.
1	„	„	7	„ ditto, rather a louder noise.
1	„	„	8	„ ditto, the greatest noise.
1	„	„	9 to 14	„ ditto, a diminished sound.
1	„	„	15	„ the flame enlarged without exploding,
1	„	„	16 to 30	„ the increase of the flame gradually diminishing.

The most explosive mixture, therefore, consists of one part of gas and eight parts of air, and if we suppose such an inflammable gaseous mixture in a state of combustion to be enveloped by a metallic gauze of sufficient fineness, the heat will be dissipated by the metal with such rapidity that the temperature of the gases will be reduced below the point of ignition.

We are now enabled to understand the construction of the Davy lamp, as illustrated by the following wood-cuts:—



1.



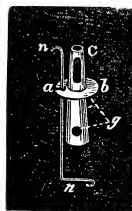
2.



3.



4.



5.



6.

Fig. 1 is a front view ; fig. 2, section ; figs. 3 and 4,

horizontal section through $M N$ and $M' N'$; figs. 5 and 6 show minor details.

It thus consists of three distinct portions, viz.—the lower part, which serves as a reservoir of oil; the body, or circular envelope of wire gauze impermeable to flame; and the exterior, or brass-frame work.

The oil cistern, $A A$, is a metallic cylindrical box, the upper surface of which is formed of a copper or brass plate, with a circular opening in the centre; a ring screws into this opening, rising slightly above the surface. The socket which supports the wick consists of a circular plate $a b$, attached to a vertical tube c . This tube has a lateral rectangular opening g , through which the hook n is made to adjust the wick. This hook accurately fits the tube which passes through the oil cistern, which has a slight projection, p , to receive the handle of the hook, and so prevent any accident from suddenly placing the lamp on the floor.

The cylinder is made of wire gauze, $\frac{1}{40}$ to $\frac{1}{60}$ inch in diameter, containing from 700 to 1000 meshes to the square inch, and about 6 inches long, with $1\frac{1}{2}$ inch diameter.

The frame is composed of four or five strong metal rods, $r r$, attached to an upper metal plate, k , thus protecting the lamp from any falling body, and to the bottom by a circular ring, o , fitted with a screw, w , for insertion in the oil cistern.

A ring, d , connected with the plate, k , enables the miner to carry or suspend the lamp from the roof.

The cylinder is secured to the oil cistern by a lock, e , which has been further protected by the use of a long key crossing the top of the lamp, $a b$.

This lamp has been the subject of innumerable experiments to test its safety and ascertain its liability to failure; but the best criterion of its value consists in the fact, that from 12,000 to 15,000 are in daily use in the northern counties.

Some facts have been ascertained, which, to a certain extent, militate against its absolute security under all circumstances; thus, a strong current of air carries the flame through the gauze, to remedy which, a shield has been used on the windward side. Besides, gauze yields to the action of a column of flame after some time; but to this it ought never to be exposed in carefully conducted mines.

The late eminent engineer, George Stephenson, independently of the celebrated chemist, had discovered the same principles of safety, and invented a lamp in 1815, which is still in use in some collieries. The "Davy" and the "Geordey" have become household words among us, and to our shame no other memorial in the land proclaims the gratitude of their countrymen.

Subsequently, Upton and Roberts proposed a modification, by employing a glass cylinder to defend the flame from the action of currents of air, which has been still farther improved by Glover and Cail, in introducing a current of cold air between *two glass cylinders*, one of the objections to the use of glass being its liability, after becoming heated, to break on the application of cold air or water.

It is impossible to describe within our limits all the various forms which have been suggested. Some are characterised by great delicacy, so that the flame is extinguished by the slightest explosion. Another indicates the presence of a large quantity of gas by a peculiar noise, or, in the language of the inventor, "Elle crie dans le danger;" but none combine so many *practical* advantages as the Davy.

Mr. Stagg suggested employing the electricity of the waste steam of the colliery engines by means of Armstrong's machine. He proposed to carry a wire down the shaft, and to break contact wherever a light was required, protecting the charcoal points within a glass cylinder hermetically sealed.

We now reap the benefit of the labours of many ingenious men for the last half century in a cheapened fuel; and if we cannot yet count upon perfect immunity from danger for our miners, the following statistics will show how far this danger has been reduced to a minimum.

Previous to the introduction of the safety-lamp, from 1817 to 1825, there was one life lost for every 142 miners employed per annum, and after the use of the Davy, from 1825 to 1831, this was reduced to 1 in 345.

Mr. Taylor has now adopted a different standard by which to judge of the efficiency of the precaution employed in lighting and ventilating coal-mines, viz., *the quantity of coal raised for the loss of one life*, and he finds at present that the following is the result of his inquiry:—

Durham and Northumberland	..	..	84,000 tons.
Great Britain	..	..	43,000 ,,
Belgium	..	..	34,000 ,,
St. Etienne, France	..	..	rather more than Belgium.
Germany	..	..	do. do.

In 1853, the number of persons employed *underground* in the northern counties, was estimated at 33,000, and the total loss of life from all causes was 151,—a number lamentably too high, and which, we hope, may be annually reduced by improved methods of working and ventilation, increased education among the miners, and a deeper sense of responsibility among all engaged in this important source of national wealth.

T. R.

NOTES ON NORWAY.

No. VI.

ISLANDS OF EIDER-DUCKS. SAI THE-SHOWER. OVERLAND JOURNEY. FORFEIT-MONEY. COUNTRY INNS. ASCENT OF SNEEHAETTEN. A ROYAL WAITER.

SOON after leaving Bodö, we recrossed the Arctic circle. A day or two after this, landing on the little island of Sövik, we engaged a fisherman to pilot us to the Stor Braken, an island famous for the abundance of its Eider-duck. It is one of the outermost islands; and the length of the sail from Sövik to the Brakens gave us some idea of the depth of the belt of islands, great and small, which hem in the coast. We were surprised to find inhabitants on these outer islands, the *ultima Thulæ* of Norway. They all turned out, though it was midnight, and surveyed us with great interest. They were most grateful for some Norsk tracts and some tobacco, which we gave them. We found the Eider-duck very abundant, and it is from these islands that a large portion of the down is procured which gives to German quilts and pillows their cloud-like softness and lightness. We had engaged our pilot for the day, at the rate of half a thaler. But when we came to part with him, he would not accept the full amount, because he had been with us much less than twenty-four hours; and this, though we were obliged to land him at a considerable distance from his home. We had to employ no little urgency before he would yield. It is pleasant in this Mammon-loving age to meet with traits like this.

About eleven o'clock next night, while becalmed between two islands, and occupied with tea in the cabin, we were

startled by a sudden splashing and dashing in the sea close beside us, which resembled the noise of a waterfall. Going on deck we found that a vast shoal of saithe were disporting themselves in the sound. They seemed to be in pursuit of a shoal of very small herrings; and they, in their turn, were pursued by some half-dozen porpoises, which tumbled about in their track. For a minute or two the noise and commotion would entirely cease, and then be suddenly recommenced with fresh energy in another part of the sound. Putting off in our small boat, we were soon at the margin of the disturbed waters with salmon-rods and lines. The saithe leaped so greedily to the fly, that in less than an hour we returned with a copious supply of them, varying from one to five pounds. Their rapid change of place, with the incessant cataract-like noise produced by their leaping, and the occasional appearance among them of an unwelcome porpoise, made the little bay a sufficiently animated scene for an hour or two. During the day we had several whales of considerable size sporting about our vessel.

Next day, Sunday, it blew almost a gale from the south, with incessant rain, obliging us to lie at anchor in the snug sound of Naerö, among the Vigten Islands. We were struck with the excessive variableness of the climate. A few days before we had been scorched with the heat of the cloudless and almost unsetting sun; now it was so chilly that we were glad to cower over a fire in the cabin, as we listened to the rain pelting upon the masts and deck above. We were able, however, to congratulate ourselves that this was the first thoroughly bad day we had encountered.

On the morning of the 20th of July we again found ourselves riding at anchor among the little merchant fleet of Trondhjem Bay. Here our mode of travel was to undergo a change. We had resolved to proceed overland from Trondhjem to Christiania, and thus gain some acquaintance

with the interior of the country, while the yacht was to be despatched to Christiania to meet us there. We were accordingly busied with the necessary preparations. Our kind friend Mr. K. had, at our request, secured two carriages for us. On finding our charioteer, however, we discovered that he expected three days' notice. Days were too precious to us to admit of such delay; so we told Ulle (the name is, perhaps, the commonest in Norway) that we wanted to start next morning. "Next morning!" he said; "the thing is impossible!" "And why impossible?" I asked. "Because we are not ready. The saddler is repairing the cushions, and the smith is repairing the wheels, and they cannot be done for two or three days." "Take me to the saddler's," I said, "and we shall see." It turned out, as I anticipated, that an hour or two's work was all that the cushions required, and with some difficulty we got a promise that they should be ready by six next morning. A similar assurance was, with similar difficulty, procured from the smith. And these engagements were kept. If the Norwegians are slow and cautious in making engagements, they are most faithful in keeping their promises. Poor Ulle looked very much surprised at this mode of despatching business, and managed to find out some other difficulties; but these, too, being disposed of, he at length agreed to be ready for us on the beach at seven o'clock next morning. We would strongly advise the traveller in Scandinavia to see to his own affairs whenever time is an object.

We were occupied most of the day in laying in the necessary provisions, &c., both for the yacht and for ourselves. We filled a large tin box with loaves, fowls, ham-beef, &c. Next morning, true to his word, Ulle was waiting for us with his carriages at the landing-place at seven o'clock. Our own arrangements, however, were not completed, so that we were about two hours behind the appointed time in

starting. The effect of such delay in a Norwegian journey is rather serious; for you incur a certain amount of "forfeit-money" not only at starting, but at each successive relay throughout the day's journey. It is necessary, in order to secure your progress, to send on a *forbud*, or missive, requiring that so many horses be in waiting for you at each station at a certain calculated hour. This is required, as the post-horses are, for the most part, either engaged in agricultural employments or running at large on the mountains. The forfeit-money is only a reasonable compensation to the "post-master" for lost time; and, of course, the programme of a whole journey is disordered by a lack of punctuality at the outset. The "post-master," on the other hand, incurs a fine if his horses are not forthcoming at the time specified in the *forbud*. Our first day's experience was not lost upon us, as we never afterwards incurred any forfeit-money. This system of posting is found to answer well. We invariably found a sufficient relay of horses at the stations; and only on one or two occasions, when the *forbud* was not sufficiently in advance of us, were we kept waiting.

The great roads in Norway are well maintained. They are, indeed, in many places very steep; often unnecessarily so, according to the old-fashioned engineering which presumed the curve which a road takes over the top of a hill to be shorter than that which it might be made to take round the base of it. The maintenance of the roads is much better than their engineering. Before the traveller has proceeded many miles, he is struck with the numerous sign-posts on the highway. The inscription states the property which is charged with keeping the road in repair, and the number of ells so to be maintained. The material used for repairs is chiefly the gravel of the rivers, producing in level districts and in favourable circumstances a roadway as smooth as the approach to a baronial mansion in our own

country. Such at least is the case at midsummer and in autumn. In the spring months travelling in Norway is almost impossible, owing to the melting snow, the mud, and the torrents. In winter it is better, for the frozen rivers (by the side of which the roads for the most part run) afford a smooth and safe surface for the passage of sledges.

The change in our mode of travelling gave a zest to our enjoyment. The fjord views from the heights were fine, but the chief charm of the scenery was centred about the Gula Elv, whose course we followed all day. At Volland, a pretty station on its banks, about thirty miles from Trondhjem, we halted to unpack our provender and pic-nic on the green sward. Jugs of fresh milk from the little inn formed an acceptable addition to our meal. The weather being intensely hot, we enjoyed a delicious bath in the broad and rapid Gula. The valley of the Gula abounds in legendary lore. Von Buch describes it as the cradle of the land. He says, "the whole antiquity of the land is crowded together in this valley." This is owing to its proximity to the ancient capital, to its remarkable fertility, and possibly also to the facilities for defence furnished by its lofty and often precipitous banks. Nature, too, has clothed the scene with fitting accompaniments of beauty. Our drive the same evening along the banks of the Gula to Hov was surpassed for varied beauty by no scene between the two capitals of Norway. The broken and craggy banks are laden with pine, varied with birch, and the rapid windings of the stream give a constant freshness to the scene.

Hov was our first sleeping station. It proved to be a group of farm-buildings pleasantly situated on a height over the river. We found the rooms and the linen remarkably clean. Our fare was simple, consisting of *flad-bröd*, river-fish, eggs, milk, and *gröd*, or barley-meal porridge. *Flad-bröd* is a wafer-thin cake made of oatmeal, or oat and

barley-meal mixed. It is the staple bread of the country, loaf-bread being entirely unknown in the interior. Gröd, too, we could always procure, and along with the rich mountain milk, of which there was great abundance, it formed an important item in our daily diet. Cheese was generally produced, especially goat-milk cheese, but the virulent flavour of it was too much for our southern palates. If we wished to eke out our meal, we could always command a blazing pine-wood fire, to make available a few slices of bacon or a modicum of rice from our own capacious provender-box. And if fresh fish were not at hand, it was not generally a difficult matter to extemporise a dish of trout or grayling from the nearest stream. The inns in the interior are all farm-houses, and we found them, with very few exceptions, clean and comfortable. On getting our bill at Hov next morning we found it drawn out on the most moderate scale, as is the case universally in the interior.

With our reader's permission we will carry him, without the fatigue of travel, down the vale of the Orkel and up that of the Driva to Drivstuen, the comfortable station where we slept on the following night. From this a magnificent drive along the banks of the dancing river conducted us to Kongsvold.

Kongsvold being a convenient point from which to make the ascent of Sneehaetten, we sent on our carriages to Hjerkin, and procured horses and guides. Sneehaetten was long considered the monarch of Scandinavian mountains; but the more accurate measurements of recent times have shorn it of this distinction, and placed the crown on the rugged brows of Galdhøpigen, the loftiest summit of the Ymes-fjeld. The height of Sneehaetten is 7763 feet, but it must be admitted that its appearance does not come up to the expectations excited by its elevation, from the circum-

stance of its rising from the lofty plateau of the Dovrefjeld, whose average height exceeds 3000 feet. The Dovrefjeld must not be conceived of as a mountain-chain, but rather as an elevated plain, covering hundreds of miles of country. This plain is a vast, boggy wild, relieved with unimportant elevations; and from it spring various ridges of mountains, of which Sneehaetten is the chief.

The ascent conducted us rapidly through the various belts of vegetation, till we reached the region of dwarf-willow and dwarf-birch, when we had a long course of almost level land to traverse. The ground was in parts covered with bright anemones, and gentians of exquisite blue. By and by only mosses appeared, at first in astonishing and beautiful variety, but diminishing gradually, till only club-moss and reindeer-moss were visible. After crossing a brawling torrent, we left our horses in charge of one of our guides. The ascent of the final summit is an affair of some difficulty, from the looseness of the stones, great and small, with which it is covered. These being in many places hidden with snow, the interstices form traps for the legs of the climber, which it is not easy to avoid. The ascent is steep and fatiguing, bearing some resemblance to the upper portion of Ben Nevis. Unfortunately, as we approached the summit, mists began to descend upon it, which deterred some of the party from pressing on to the top; and, indeed, there was no view from it except that of a few yards of snow, and then an impenetrable curtain of cloud. We found some reindeer horns on the very summit. One side of the mountain terminates in a vast precipice, which descends to a valley filled with snows that never melt.

We had not been long descending when the mists rolled majestically away, and afforded us splendid views of the snowy ridges around us, and a fine opportunity of judging of the desolate and almost interminable expanse of the plain of the Dovrefjeld. Turning in the direction of

Hjerkin we varied our route, and thus were led to traverse a considerable extent of red snow. There were various glaciers, more or less perfect, among the roots of the ridge; but one in particular, which lay to our right as we descended, riveted our gaze. It was remarkable from terminating in a half-frozen lake, above whose waters it reared a precipitous ice-cliff of at least 200 feet in height, according to our estimate. A number of small icebergs (for we may fairly employ the term), detached no doubt from the overhanging glacier floated on the surface of the lake. On these, and on the glacier, and on the waters of the lake itself, rested tints of the most exquisite blue, brought out into strong relief by the black waters of many neighbouring tarns. We were strongly tempted to explore the beauties of this lovely scene, which, in memory, forms the principal feature of the day's excursion; but our feet bruised and our limbs wearied with the stony ascent, declined the digression.

It was half-past nine o'clock when we remounted our steeds on the Hjerkin side of the mountains, and we had a ride of fourteen miles before us, over hill and dale, through rivers, and, what was worse, bogs. There is no human habitation—if the summer hut of an adventurous native hunter be excepted—till Hjerkin is reached, and, of course, there is no kind of path or track. So far south as this, the light became sufficiently obscured to reveal a few stars to us, the first we had looked upon for some weeks. Slowly and sleepily we plodded on, our trusty and enduring steeds picking their steps with wonderful skill in the dim twilight, among the pits and breaks of the boggy ground. The excitement of the expedition was over; the ground was desolate and unvaried, and the length of the way seemed interminable. The Driva was successfully forded, but still no Hjerkin. At last, to our great joy, our foremost rider shouted the welcome words, "Smoke a-head!" The white houses of our resting-place appeared, and at half-past one we were

comfortably established before a blazing wood-fire, while the awakened household were busily preparing a supper of Driva trout and flad-bröd.

We spent two days in this retreat, the fishers of our party finding excellent sport in the neighbouring streams. One drawback to the enjoyment was, that on the banks of the Driva, in spite of veils, gloves, and other precautions, we were almost devoured by mosquitoes.

Our hostess and the innkeeper at Kongsvold are said to be almost the only remains of the ancient Norwegian nobility. They are reported to be descended in a direct line from the celebrated Harald Harfagar. They have lived from time immemorial on their mountain property. The possessions of our hostess were very extensive; her herds of cattle are large, and her fame is wide-spread for the breed of pure Norsk horses reared on her estate. She showed us, among other relics, a handsome and evidently very ancient chased silver goblet, which is handed down from generation to generation. Yet such are the simple manners of the country, that this daughter of Harfagar waited upon us at table. She was most kind and courteous, and invited the ladies to inspect the mysteries of her extensive dairy, which was beautifully clean and well regulated. Altogether, she quite won our hearts. I should mention that our guide to Sneehaetten was no less a personage than Harfagar's other descendant, mine host of Kongsvold.

We enjoyed the refreshment of a Sabbath in this solitude. We had service in the large salle, a Christiania advocate and his family, and four young Englishmen, besides a number of the retainers of Hjerkin assembling with us, though the latter were, of course, unable to understand. They are twenty miles from any church, but we were glad to learn that they are in the habit of assembling each Sabbath to read the Scriptures among themselves.

R. H. L.

LIFE, IN ITS HIGHER FORMS.

No. I. (*continued*).

FISHES.

As the innate selfishness of our hearts always prompts the question, *cui bono?*—it may be as well to commence this paper with a few particulars of the usefulness of FISHES in ministering to our bodily wants. The value of fish as an article of human food has been appreciated in all nations and all ages. The earliest pictorial records of Egyptian every-day life are largely occupied with the capture and preservation of these animals; various forms of nets, the fish-spear, the hook and line, are all in requisition, and strings of fishes, split and salted, and hung out to dry, remind us of scenes familiar enough to the writer of these papers,—the cod-fisheries of Newfoundland. Allusions to the hook and line occur in the most ancient of writings,—the Book of Job; and in the Mosaic Law, “whatsoever hath fins and scales in the seas and in the rivers,” was freely given to Israel for food. The most remote and savage tribes feed largely on a fish diet; and the ingenious devices and implements employed by the islanders of the Pacific Archipelago far exceed in variety, and in their elaborate effectiveness, those produced by European art. Every sea, from the Pole to the Equator, is stocked with fishes; they abound in the rivers and lakes of all climates; even the “tarns” and little basins scooped out of the summits of mountain-ranges, hold species of interest and value peculiar to themselves. So that the beneficent Providence of God has thus stored up inexhaustible magazines of wholesome, palatable, and nutritious food, and placed them within reach of man for the

supply of his necessity,—the stimulus and the reward of industry.

The fisheries of Britain are of national importance; the amount they contribute to the public wealth is immense; and they are regulated, even in many minute details, by repeated enactments of solemn legislation. An enumeration of the species which form the objects of our fisheries is itself startling:—the surmullet, gurnards of half-a-dozen kinds, sea-bream, mackerel, scad, dory, atherine, grey mullet of two kinds, gar-fish, salmon, herring, pilchard, shad, cod, haddock, pout, whiting of two kinds, pollack, hake, ling, burbot, torsk, turbot, holibut, sole, flounder, plaice, dab, eels of three species, conger, thornback, skate of several kinds,—are all taken in quantities and brought regularly to market; not to speak of many other kinds, such as perch, trout, char, pike, carp, roach, tench, &c., which are taken for the table, chiefly from our rivers, for individual amusement.

The quantity of human food thus taken yearly from the water is enormous; an idea of it may be formed from the fact, that, of one species alone, and that a very local one, being confined to the western extremity of our island,—the pilchard,—the Cornwall fisheries yield 21,000 hogsheads annually. What, then, must be the produce of all the species above enumerated, all round the indented coasts of Britain and Ireland? We have no sufficient data to determine the commercial value of British fisheries; but it has been loosely estimated by Mr. M'Culloch at 3,500,000*l.*, and by Sir John Barrow at 8,300,000*l.*, per annum.

The possibility of capturing fishes of any particular species at any given time, with tolerable certainty, in such numbers as to constitute a *fishery*, is dependent on certain instincts and habits in such species leading them to associate in multitudes in particular localities at particular sea-

sons. The most prominent of these instincts is connected with reproduction. It is essential to the hatching of the spawn (or eggs) of most fishes, that it be deposited in comparatively shallow water, within reach of the vivifying influences of light and heat. Hence, as the season of spawning draws nigh, the various kinds leave the deep water, and approach, in countless hosts, the shores, where they are readily seen and captured. And it is a most beneficent ordination of God's providence, that at this season they are in the very best condition for food: let the spawn be once deposited, and the fish is worthless. What is more vile than "a shotten herring?"

Any one who will look with curiosity at the "hard roe" of a Yarmouth Bloater, may form a notion of the extent to which fishes obey that primal law, "Be fruitful, and multiply, and fill the waters in the seas" (Gen. i. 22); for this hard roe is nothing else than the accumulation of eggs in the ovary of a female fish: every seed-like grain an egg, and all to be laid in the course of a few days;—the contribution of one individual herring to the population of the seas! It would be no sinecure to count them; but partly by counting, partly by weighing, approximations have been made to a knowledge of the extent of a fish's family. Six millions of eggs have been estimated to lie in the roe of a single cod!

Now, of course, an immense proportion of this number comes to nothing; perhaps three-fourths of these eggs are devoured by other fishes, or voracious creatures of one kind or other, almost before they well reach the bottom; and of the proportion that is hatched, multitudes find a speedy termination of existence in the maw of their watchful and numerous enemies. For, as a general rule, fishes are universally carnivorous; every species preying without mercy upon all others that it can master and swallow.

Some curious examples of this voracity are on record. Mr. Jesse speaks of a Pike, to which he threw in succession five Roach, each about four inches in length. "He swallowed four of them, and kept the fifth in his mouth for about a quarter of an hour, when it also disappeared." At a lecture delivered before the Zoological Society of Dublin, Dr. Houston exhibited as "a fair sample of a fish's breakfast," a Frog-fish, two feet and a half long: in the stomach of which was a Codfish, two feet in length; the Cod's stomach contained the bodies of two Whittings of ordinary size; and the Whittings in their turn held the half-digested remains of many smaller fishes, too much broken up to be identified.

"Harsh seems the ordinance, that life by life
Should be sustained; and yet, when all must die,
And be like water spilt upon the ground,
Which none can gather up,—the speediest fate,
Though violent and terrible, is best.
O with what horrors would creation groan,
What agonies would ever be before us;—
Famine and pestilence, disease, despair,
Anguish and pain, in every hideous shape,—
Had all to wait the slow decay of nature!
Life were a martyrdom of sympathy;
Death lingering, raging, writhing, shrieking torture:
The grave would be abolished; this gay world,
A valley of dry bones—a Golgotha—
In which the living stumbled o'er the dead
Till they could fall no more, and blind perdition
Swept frail mortality away for ever.
'Twas wisdom, mercy, goodness, that ordain'd
Life in such infinite profusion,—Death,
So sure, so prompt, so multiform, to those
That never sinn'd, that know not guilt, that fear
No wrath to come, and have no heaven to lose."

MONTGOMERY.

The statement has been common, in books of natural history, that fishes manifest no parental affection or care;

that the spawn having been deposited in the proper situation, the parents' work is done, and all their solicitude ceases. It is possible that this may be the general rule; but it is not without numerous exceptions. As early as the time of Fabricius it was known that the male Lump-sucker kept a strict watch over the spawn when laid, defending it with the most obstinate courage. And recent observations have added not a few other examples of parental care among fishes, not exceeded by the devotion of the mother *bird*. Within a few months a most interesting detail has been published by Mr. Warrington, of the nest-building instincts and tender care of the commonest of British fishes—the tiny Stickleback that swarms in every pool.

In the month of May the male Stickleback, which is then adorned with the most brilliant tints—his nuptial dress—begins to make a nest. For this purpose he selects small woody fibres, rootlets, &c., which he collects one by one; and carrying them to the selected place, inserts them into the ground, and skilfully interweaves them, so as to form a ring. Now and then he collects minute bits of gravel, and brings mouthfuls of sand, all of which he lays upon the fibres to keep them steady. Thus a thick ring of interlaced materials is at length made, with a hole in each of the two opposite sides, through which the fish can squeeze himself. During the whole time the little creature resents the least intrusion on his operations, attacking his fellow fishes with the utmost fury, and driving them to a distance. The house being ready, the lady is invited to take possession; and the following curious scene ensues:—

“The female fish came out of her hiding-place, her attention being fixed apparently on the nest; when immediately the male became, as it were, mad with delight. He darted round her in every direction, then to his accumulated materials, slightly adjusted them, fanned them, and then

back again in an instant. This was repeated several times. As she did not advance to the nest, he endeavoured to push her in that direction with his snout: this not succeeding, he took her by the tail and by the side-spine, and tried to pull her to the spot, then back to the nest; and having examined the two small openings alluded to, he thrust his nose in at the lower, and gradually drew himself under the whole of the materials, making his exit at the opposite one, as though to prove to her that everything was prepared for her spawning.”*

The female now deposits her spawn in the nest; and is immediately repulsed by the male as earnestly as she had been invited. The nest is then opened by the male to the action of the water, which, by a peculiar motion of his body, called in the previous extract “fanning,” constantly repeated, is driven in currents over the spawn. This proceeds for about ten days; at the end of which period the male sets himself to destroy and scatter the materials of the nest, so as to leave a space of clean gravel about three inches in diameter. Let Mr. Warrington tell us what next:—

“Watching carefully, for a short time, to understand what all this busy alteration indicated, I at last had the pleasure of observing, by the aid of a long-focused pocket lens, some of the young fry—of course most minute creatures—fluttering upwards here and there, by a movement half swimming, half leaping, and then falling rapidly again upon or between the clean pebbles of the shingle-bottom. This arose from their having the remainder of the yelk still attached to their body, which, acting as a weight, caused them to sink the moment the swimming effort had ceased.

“Around all the space above mentioned, and across it in every direction, the male fish, as the guardian, continually moved. And now his labours became still more arduous

* “Annals of Nat. Hist.” Oct. 1852.

than they had been before, and his vigilance was taxed to the utmost extreme ; for the other fishes, three of them twenty times larger than himself, as soon as they perceived that the young fry were in motion, used their utmost endeavours continuously to pounce upon the nest and snap them up. The courage of this little creature was certainly now put to its severest test ; but, nothing daunted, he drove them all off, seizing their fins, and striking with all his strength at their heads and at their eyes most furiously. All the assistance that could possibly be afforded him was of course rendered, short of actual interference, by keeping them pretty well fed in order to allay, if possible, their voracity. Another circumstance, which appeared to add greatly to the excitement that he was constantly subjected to, arose from a second female fish, being in spawn, endeavouring most pertinaciously to deposit her *ova* in the same locality, and hence rushing frequently down towards the spot. But the male fish was ever on the alert ; and although he did not strike at her in the furious way he attacked the larger ones, yet he kept continually under her, with the formidable back-spines all raised erect, so that it was impossible for her to effect her apparent object.

“ The care of the young brood, while encumbered with the yelk, was very extraordinary ; and as this was gradually absorbed, and they gained strength, their attempts to swim carried them to a greater distance from the parent fish ; his vigilance, however, seemed everywhere ; and if they rose by the action of their fins above a certain height from the shingle bottom, or flitted beyond a certain distance from the nest, they were immediately seized in his mouth, brought back, and gently puffed or jetted into their place again. This was constantly occurring ; the other fishes being continually on the watch to devour the stragglers, and make a savoury morsel of these Lilliputian truants. Indeed, the

greater number of the whole brood must have fallen a prey to their voracity, as it was only some three or four that reached a size to place them beyond the power of their destroyers."*

Some of our fishes perform long migrations in order to deposit their spawn. The Salmon, for instance, ascends rocky rivers from the sea, overcoming various barriers, and leaping up cascades, to accomplish its purpose, with indomitable perseverance and energy. The Eel, on the other hand, descends rivers to spawn in the brackish waters of estuaries, displaying equal determination. Of this a curious example is said to occur annually in the vicinity of Bristol.

Near that city there is a large pond, immediately adjoining which is a stream. On the bank between these two waters a large tree grows, the branches of which hang into the pond. By means of these branches the young Eels ascend into the tree, and from thence let themselves drop into the stream below, thus migrating to far distant waters, where they increase in size, and become useful and beneficial to man. A casual witness of this circumstance remarked that the tree appeared to be quite alive with these little animals. The rapid and unsteady motion of the boughs did not appear to impede their progress.

Did space permit, we could furnish many entertaining details of manners in this Class of animals, in their various modes of taking prey; but we must content ourselves with one. An interesting example of what we may be allowed to call skill, is afforded by the instincts of some of those beautiful little tropical fishes called *Chætodons*. In the East Indies these are kept in vases for the purpose of witnessing their unerring archery, as their feats in this way are highly amusing. The manners of these little fishes (abundantly confirmed by subsequent testimony) were first

* "Annals of Nat. Hist." Nov. 1855.

described by Dr. Schlosser, in a communication to the Royal Society, on the authority of Mr. Hommel, the Governor of the Hospital at Batavia.

The little fish alluded to (*Chelmon rostratus*) "frequents the shores and sides of the sea and rivers in search of food : when it spies a fly sitting on the plants that grow in shallow water, it swims on to [within] the distance of four, five, or six feet ; and then, with a surprising dexterity, it ejects out of its tubular mouth a single drop of water, which never fails striking the fly into the sea, when it soon becomes its prey.

"The relation of this uncommon action of this cunning fish raised the Governor's curiosity ; though it came well attested, yet he was determined, if possible, to be convinced of the truth by ocular demonstration. For that purpose he ordered a large wide tub to be filled with sea-water ; then had some of these fish caught and put into it, which was changed every other day. In a while they seemed reconciled to their confinement ; then he determined to try the experiment.

"A slender stick, with a fly pinned on at its end, was placed in such a direction on the side of the vessel as the fish could strike it. It was with inexpressible delight that he daily saw these fish exercising their skill in shooting at the fly with an amazing velocity, and never missed their mark."*

P. H. G.

* "Phil. Trans. for 1764," vol. liv. p. 89.

METEORIC STONES.

SOME bookworm of the fifteenth century, poring over a rare manuscript of Livy, may have chanced to read that in the early days of Rome, when Tullus Hostilius was king, word was brought to the Senate that a shower of stones like hail had just fallen on the Alban Mount, and the Patres Conscripti, being sceptical, sent a commission to inquire about the matter, who found it was true as narrated. Had our scholar taken the book to the wisest natural philosopher of his day, and asked his opinion about the story, he might have been answered in terms such as these:—"Learned friend, what thou hast read is nought but a fiction. This narrative of Livius is but one form of that myth unto which the nations of antiquity so commonly gave their belief. Take as an example that black stone which had its place over the gate of that temple of Diana at Ephesus which the ancients held for one of the seven wonders of the world. The priests pretended that the goddess herself had thrown down that mighty stone from heaven. No, my learned brother, there are indeed divers marvellous stones, chiefly that one which can turn tin and lead into gold; which we, philosophers of Hermes, do not cease with much zeal to seek after; and which, I confide to thee in all secrecy, I, thy unworthy friend, am just on the eve of obtaining. The planets, truly, rule over the actions and the destinies of men, and there can be no subtler or wiser pursuit than to seek out their occult influences, but no true philosopher believes that they fall from their houses in the empyrean."

And how, courteous and intelligent reader, have you come to believe when the title of this paper caught your

eye, that it was to be a dissertation on facts, and not a play of fancy? You never saw a stone fall from the sky, nor did any of your friends ever see one. You have noticed, I dare say, the earthy and metallic masses in the British Museum, which bear such labels as—"Meteoric Stone, which fell Dec. 13th, 1795 (at $\frac{1}{2}$ past 3 o'clock P.M.), in the Parish of Thwing, East Riding, Yorkshire." And, perhaps, you have seen similar collections at Vienna or other places; but then you know very well that for anything you can see to the contrary they may have come from the nearest iron-furnace. How do you come to believe in their descent from the airy spheres? Why, like a sensible man, you believe it on the testimony of others; just because there is such a mass of varied and concurrent testimony, that to esteem it all false is more difficult than to credit the wonderful fact, that from time to time huge stones have actually fallen from the skies; and though on the one side you may hear that among living scientific men, there may be one or two still sceptical, and though on the other hand you find philosophers who see an aërolite in every bit of rough iron that is picked up in any unaccountable position, your faith is unshaken.

At the close of the fifteenth century, Professor Bautenschoen, of Colmar, called the attention of the learned world to the accounts of the great stone which was said to have fallen from the skies on the 7th of November, 1492. It weighed 260 lbs., and was kept in a church at Ensisheim, and King Maximilian and many other notable people went to look at it, but could make nothing of it unless a miracle.

In 1510, there fell in Lombardy a shower of stones, one of which weighed 120 lbs. The historians have found in it a political signification.

We have good evidence that in the territories of Jalinder, in Persia, in 1620, a large mass of iron fell hissing hot,

and buried itself in the earth. The king ordered a sabre, knife, and dagger to be made of it, but it was not malleable, and had to be mixed with other iron before what was required could be done.

But till sixty years ago scarcely any attention was given to these meteoric showers ; even the falling of one weighing 50 lbs. near Flamborough Head scarcely roused the curiosity of the British *savans*; but when about that time Major Williams brought to this country some fragments of a stone that fell at Benares, Sir Joseph Banks caused them to be analysed, and the chemist's report showed them to be so different from anything commonly found on the earth, that the united testimony pretty well established the fact that there are such things as meteorites.

And just at that time the skies seemed intent on convincing men that meteoric stones were indeed no airy imaginations, but "hard facts." There occurred some most startling exhibitions of this character, and that on a grand scale. At Landes in France, at Sienna in Italy, they fell. One of the narratives of the time, well vouched for by numerous witnesses, we will abridge from Rees' Cyclopaedia : " On Tuesday, April 26th, 1802, about one in the afternoon, the weather being serene, there was observed from Caenpont, Andemer and the environs of Alençon, Falaise, and Verneuil, a fiery globe with a very brilliant splendour, which moved in the atmosphere with great rapidity. Some moments after there was heard at Laigle and the environs of that city, to the extent of more than thirty leagues in every direction, a violent explosion which lasted five or six minutes. At first there were three or four reports like those of a cannon, followed by a kind of discharge resembling a fire of musketry, after which was heard a dreadful rumbling like the beating of a drum. The air was calm and the sky serene, except a few clouds such as are fre-

quently observed. This noise proceeded from a small cloud which had a rectangular form, the largest side being in a direction from east to west. It appeared motionless all the time the phenomenon lasted, but the vapour of which it was composed was projected momentarily from the different sides by the effect of the different explosions. This cloud was about half a league to the N.N.E. of the town of Laigle. It was at a great elevation; for the inhabitants of two hamlets, a league distant from each other, saw it at the same time above their heads. In the whole canton over which this cloud hovered, a hissing noise like that of a stone discharged from a sling was heard, and a multitude of mineral masses were seen to fall at the same time. These stones fell over a space of about two leagues and a half in length, by nearly one league in breadth. The largest of those that fell weighed $17\frac{1}{2}$ lbs., and they were the first to descend. The whole number was certainly above 2000 or 3000."

A still greater phenomenon of the same kind occurred at Weston in Connecticut on the 14th of December, 1807. There also was observed a globe of fire, which seemed to make three bounds before it disappeared, and at each bound shot a shower of stones, sprinkling them along a course of nine or ten miles. One mass was seen to fall with a streak of light, and the shock produced by its concussion against the earth was felt; and when the proprietor of the field where it fell went to look after his frightened cows, he found that a ridge of micaceous schist had been shivered; and there, in a hole five feet long by four and a half broad, and three deep, and all around, mixed with torn pieces of turf and earth, lay the fragments of a meteoric mass, which in its integrity must have weighed 200 lbs. Every now and then since similar occurrences have been heard of. Sometimes, also, nearer home; as, for instance, at a quarry near Glasgow, when two men and two boys heard a noise,

thought a judgment was coming upon them, then found themselves surrounded by "Oh! such a reek!" and a lump of iron smashed a drain not far from where they were standing.

When these stones descend they generally enter the ground to some depth, and that in a slanting direction. If picked up shortly after falling they are hot, and sometimes have a sulphureous smell; their form is of the most varied character, often jagged, yet the edges are generally somewhat rounded, as though they had been exposed to the action of fire, and they are usually covered by a black crust. Their composition is highly remarkable. Almost all known meteorites consist essentially of two distinct parts—an earthy mineral and a mass of metal, the two being intermixed in every conceivable way and proportion; but some are purely metallic. The earthy mineral is a crystallised silicate of magnesia, which is well known elsewhere by the name of olivine; but it is often impure through the admixture of alumina and other substances. The metallic mass is very remarkable: It is iron mixed with a small quantity of nickel and cobalt, together with phosphorus and sulphur; indeed iron pyrites may often be detected, and a compound of a similar appearance, which has received the name Schreibersite, and which exists nowhere but in meteoric masses. It is a phosphuret of nickel and iron.

Beside these substances, the presence of carbon, chlorine, chromium, copper, manganese, calcium, potassium, sodium, tin, zinc, and in one instance lead, has been noticed, but never in any large proportion. Titanium, yttrium, and zirconium, are doubtful. The black crust is simply oxide of iron, formed, no doubt, during the transit of the heated metal through the atmosphere. What is very noticeable is, that metallic iron, or phosphuret of iron, occurs nowhere in any mineral commonly belonging to the earth, except,

indeed, in very small quantity in one or two places, where its metallic state appears to be due to organic matter or some other reducing agent.

Its association with nickel has been relied on as a characteristic of meteoric iron, but perhaps too implicitly; for though they are always united in *bonâ fide* aërolites, yet we believe many a pig and slag from our iron furnaces would be found alloyed with a minute percentage of nickel. One peculiar characteristic, however, is what are termed the Widmanstättian figures—markings on the iron, which we can best compare to the interlacing strands of a cane-bottomed chair, only less regular. Not every mass of aërial iron exhibits these; but they are beautifully displayed by some of those in the British Museum, especially by one from Lenarto in Hungary, and a small piece from Seneca Falls, New York. In the same collection may be seen among others fragments of the stones already described as having fallen at Ensisheim and Benares, as well as specimens of the showers at Sienna, Laigle, and Weston.

But whence come these stones and metallic masses? Is the air their birth-place, or do they visit us from afar? Are they bits of the moon, or the sun, or some dismembered planet? What is the fiery globe from which they have appeared to rain? The discussion of these questions we must defer to another number, when we hope to say something about fiery meteors and shooting stars, with which it is often supposed that they are closely connected.

J. H. G.

THE DOG.

(*Canis familiaris*, L.)

THERE is great diversity of standard in matters of taste. In China, a well-roasted pup, of any variety of the very variable *Canis familiaris*, is a dainty dish. In London the greatest exquisite delights in the taste of a half-cooked woodcock, but would scruple to eat a lady's lapdog, even though descended, by indubitable pedigree, from a genuine "liver-and-tan" spaniel, that followed King Charles the Second in his strolls through St. James's Park ; and which was given to her ladyship's ancestress on a day recorded, perhaps, in the diary of Mr. Samuel Pepys. Again, in the country of the Esquimaux, who has not read in the intensely interesting narratives of the Moravian missionaries, how the dogs of the "Innuits,"—of "the men," as they call themselves—are, in winter, indispensable to their very existence? Parry, Lyon, Franklin, Richardson, Ross, Rae, Penny, Sutherland, Inglefield, and Kane have told us, what excellent "carriage"-pullers these hardy children of the snow become from early infancy ; and how the more they work, like the wives of savages in Australia, the more they are kicked. Passing over the dogs of the Indian tribes of North America and the gaunt race in Patagonia, the reader may remember that the Roman youth, like the young Briton, had, in the days of Horace, his outer marks—one was, that he loved to have a dog, or a whole pack beside him,—"*gaudet canibus.*" This attachment to the dog is given us "from above," and is one of the many "good gifts" which proceed from Him, who made man and dog

“familiar,” as the apt specific name of Linnæus denominates the latter. One of our greatly-gifted poets, in a cynical mood, could write an epitaph on a favourite Newfoundlander, and end it with the dismal lines on his views of “earthly friends,—”

“He never knew but one,—and here he lies.”

Our genial and home-loving Cowper has made his dog Beau classical. We must beg our readers to refresh their memories, by looking into the Olney bard’s exquisite story,

“My spaniel, prettiest of his race,
And high in pedigree,”

and they will find that *that* story of “The Dog and the Water-lily” was “no fable,” and that Beau really understood his master’s wish when he fetched him a water-lily out of “Ouse’s silent tide.” How graceful are the last two stanzas of that sweet little poem :

“Charm’d with the sight, ‘The world,’ I cried,
‘Shall hear of this thy deed ;
My dog shall mortify the pride
Of man’s superior breed.

But chief myself I will enjoin,
Awake at duty’s call,
To show a love as prompt as thine
To Him who gives me all.’ ” *

* It may interest the reader, who does not dive deep into literary curiosities, to refer to the original edition of Hayley’s “Cowper” (4to. 1803, vol. i. p. 314), where the poet, in a letter to Samuel Rose, Esq., written at Weston, August 18, 1788, alludes to his having “composed a *spick* and *span* new piece called ‘The Dog and the Water Lily ;’” and in his next letter, September 11, he sent this piece to his excellent friend, the London barrister. Visitors to Olney and Weston, who have gone over the poet’s walks, cannot but have their love for the gentle and afflicted Cowper most deeply *intensified*.—See Miller’s “First Impressions.”

That the world might know the very “mark and figure” of this spaniel, the late able illustrator of so many topographical works (Mr. James Storer), published in his “Rural Walks of Cowper” a figure of Beau,



from the stuffed skin in the possession of Cowper’s kinsman, the Rev. Dr. Johnson.

We could linger over a prized octavo volume, published in Edinburgh in 1787; the first poem of this, “The Twa Dogs, a Tale,” occupies some thirteen pages, written with that “rare felicity” so common to *the* Bard of Scotland. We mention it, because of the peculiar happiness with which, the collie, or Scottish shepherd-dog, is described in lines that Sir Edwin Landseer alone has equalled on canvass, or his brother Thomas with the graver:

“ He was a gash an’ faithfu’ tyke
 As ever lap a sheugh or dyke.
 His honest, sonsie, bawsn’t* face,
 Ay gat him friends in ilka place.
 His breast was white, his touzie back
 Weel clad wi’ coat of glossy black;
 His gaucie tail, wi’ upward curl,
 Hung owre his hurdies wi’ a swirl.”

That’s the shepherd-dog, as we have heard him described

* “Bawsn’t,” having a white stripe down the face.—*Glossary to Burns’s Poems.*

from a specimen, which was the friend and follower of a valued one, who, when a boy ('tis sixty years ago), frisked with the dog, over *one* of the many ferny haughs that margin the lovely Tweed above and below Peebles. It is *the* collie we have seen, on one of the sheep-farms of Lanarkshire, obey its young master by a word or two, as unintelligible to us as Japanese. But to the Culter "Luath," to hear was to obey; and in a quarter of an hour a flock of sheep, which had been feeding on a hill-side half a mile off, were brought back, driven by this faithful "bit doggie." We wonder not that shepherds love their dogs. Why, even the New Smithfield cattle-drovers, who drive sheep along the streets of London on a Monday or Friday, never even require to urge their faithful partners. Well may the gifted authoress of "The Dream" address "the faithful guardian,"—

“ Oh, tried and trusted ! thou whose love
 Ne'er changes nor forsakes,
 Thou proof, how perfect God hath stamp'd
 The meanest thing he makes ;
 Thou, whom no snare entraps to serve,
 No art is used to tame,
 (Train'd, like ourselves, thy path to know,
 By words of love and blame ;)
 Friend ! who beside the cottage door,
 Or in the rich man's hall,
 With steadfast faith still answerest
 The one familiar call ;
 Well by poor hearth and lordly home
 Thy couchant form may rest,
 And Prince and Peasant trust thee still,
 To guard what they love best.”

HON. MRS. NORTON, *The Dream*, &c. p. 192.

No ordinary-sized volume, much less a short article, could give a tithe of the true anecdotes of members of the dog race. Mere references to their biography would take up a volume of Bibliography itself; just as their forms, and

character, and “pose,” give endless subject to the painter. Of modern authors, no one loved dogs more truly than Sir Walter Scott, as the reader of his writings and of his biography is well aware; but it may not be generally known that, on the only occasion when the great novelist met the Ayrshire peasant,—

“Virgilium tantum vidi,”—

the poem, which had made Burns a wonder to the boy then “unknown,” was that of “The Twa Dogs;” so that, even then, Scott had commenced to show his attachment to these faithful followers. It was in the house of Sir Adam Ferguson, when Scott was a mere lad; and the scene was described most vividly to the writer by the late Scottish knight, after whose battle in South Italy the author of “Marmion” named his pet stag-hound Maida, or, as Scott pronounced it, “Myda.” It was as the author of “The Twa Dogs” that young Ferguson and Scott regarded Burns on his entrance into the room with such wistful attention. The story is told in Lockhart, and we will not quote it further: but, leaving dogs of our own days and lands to Mr. Jesse, who has given an interesting volume on them, we will close with a few paragraphs on the Dog of the East—a very differently treated animal to that generally prized and esteemed “friend” of man in these lands of the West.

The Holy Scriptures show us, that dogs were generally despised. We select three, out of many instances. “Is thy servant a *dog* that he should do this thing?” was the question with which Hazael, ignorant of the deceitfulness of his own heart, indignantly replied to Elisha, when the prophet told him of the evil that he would yet do unto the children of Israel. (2 Kings, viii. 13.) He, “who spake as never man spake,” knowing the faith of the Syrophœnician woman, and giving her an opportunity of manifesting it “for our

example," said, in the Syriac fashion of thought, "It is not meet to take the children's bread, and to cast it to *the dogs*." (Mark, vii. 27.) And the Apostle John, in that wondrous close of the prophetic writings, says, "For without," *i. e.* outside of the New Jerusalem, "are *dogs*." (Rev. xxii. 5.) In the East up to the present day, with but few exceptions, dogs are treated with great dislike. We might quote passages in proof from almost every Eastern traveller, and may venture to extract one from the graphic page of the Rev. W. Graham, who lived five years in Syria, and who has given some noble word-pictures of men, and streets, and scenes in Damascus and other Turkish towns. Writing of Damascus,* he remarks, "The dogs are considered unclean, and are never domesticated in the East. They are thin, lean, fox-like animals, and always at the starving point. They live, breed, and die in the streets. They are useful as scavengers. They are neither fondled nor persecuted, but simply tolerated; and no dog has an owner, or ever follows and accompanies a man as the sheep do. I once went out in the evening at Beyrout with my teacher to enjoy the fresh air and talk Arabic. My little English dog, the gift of a friend, followed us. We passed through a garden, where a venerable Moslem was sitting on a stone, silently and solemnly engaged in smoking his pipe. He observed the dog *following* us, and was astonished at it, as something new and extraordinary; and rising, and making out of the way, he cried out, 'May his father be accursed! Is that a dog or a fox?'" Again, in Damascus: should a worn-out horse, donkey, or camel die in the streets, in a few hours the dogs have devoured it; and the powerful rays of the sun dry up all corrupt matter. Mr. Graham tells us that the dogs of Damascus are brown, blackish, or of an ash colour, and that he saw no white or spotted speci-

* "The Jordan and the Rhine" (1854), p. 46, and pp. 91-93.

mens. He never saw a case of hydrophobia, nor did he hear a *bark*. The dogs "howl, and make noise enough," he continues, "but the fine, well-defined *bow-wow* is entirely wanting." With a quiet humour, he hints at the bark being a mark of the civilised, domesticated dog, and as denoting, apparently, "the refinement of canine education." We have been struck with the attempts of Penny's Esquimaux dogs, deposited by the gallant Arctic mariner in the Zoological Gardens, to *get up* a bark somewhat like the "well-bred" dogs in the cages near them. Mr. Graham tells us of the Damascus dogs having established a kind of police among themselves, and, like the rooks, driving all intruders far from their district.

Dogs were not always disregarded in the East. Herodotus informs us,* during the Persian occupation the number of Indian dogs kept in the province of Babylon for the use of the governor was so great, that four cities were exempted from taxes for maintaining them. In the mountain parts of India, travellers describe the great dogs of Thibet and Cashmere as being much prized.

"The domestic dog of Ladak," says Major Cunningham,† "is the well-known shepherd's dog, or Tibetan mastiff. They have shaggy coats, generally quite black, or black and tan; but I have seen some of a light brown colour. They are usually ill-tempered to strangers; but I have never found one that would face a stick, although they can fight well when attacked. The only peculiarity that I have noticed about them is, that the tail is nearly always curled upward on to the back, where the hair is displaced by the constant rubbing of the tail." And that the same massive variety was also prized in ancient times we know, by a

* See Layard's "Nineveh and its Remains," vol. ii. (1849), p. 425.

† "Ladak, Physical, Statistical, and Historical," p. 218.

singularly fine, small bas-relief in baked clay, found in 1849 in the Birs-i-Nimrud, Babylon, by Sir Henry Rawlinson,



which is preserved in the British Museum, to which it was presented by H. R. H. the Prince Albert, and an outline of which, reduced one half, will convey a good idea to the reader of its form. We may

add that this bas-relief was first noticed and figured, in 1851, in the third edition of a truly learned and excellent work on "Nineveh and Persepolis," by Mr. Vaux of the British Museum (p. 183). These dogs, then, were nothing else than big, "low-jowled" Thibetan mastiffs, such as we occasionally see, brought over by some Indian officer; and the use for which they were employed by the ancient kings and their attendants is strikingly exhibited on some slabs from a chamber in the north palace of Koujunjik, a part of the great Nineveh. On some of these slabs, dogs are seen engaged in pulling down wild asses, deer, and other animals; and they were evidently kept also to assist in securing nobler game—"the king of beasts:"—the sport of which animals shows, how truly the Assyrian king was named "Nimrod, the mighty hunter before the Lord."

A. W.

THE ALPINE GENTIAN.

SHE 'neath ice-mountains vast
Long had lain sleeping,
When she looked forth at last
Timidly peeping.

Trembling she gazed around,—
All round her slept,
O'er the dead icy ground
Cold shadows crept.

Wide fields of silent snow,
Still frozen seas;
What could her young life do
'Mid such as these?

Not a voice came to her,
Not a warm breath:
What hope lay there for her,
Living 'midst death?

Mournfully pondering,
Gazed she on high;
White clouds were wandering
Through the blue sky.

There smiled the kindly sun,
Gentle beams kissed her;
On her the mild moon shone
Like a saint sister.

There twinkling many a star
 Danced in sweet mirth ;
 The warm heavens seemed nearer far
 Than the cold earth.

So she gazed steadfastly
 Loving on high,
 Till she grew heavenly
 Blue as the sky ;

And the cold icicles
 Near which she grew,
 Thawed in her skyey bells,
 Fed her with dew :

And the tired traveller
 Gazing abroad,
 Fixing his eyes on her,
 Thinketh on God,—

Thinks, how 'mid life's cold snow,
 Hearts to God given,
 Breathe out, where'er they go,
 Summer and heaven.

E. C.

REVIEW OF THE MONTH.

WITH the "Memoirs of Dr. Wardlaw" we must confess ourselves not a little disappointed. They do not reproduce the lively, industrious, and accomplished theologian, whose clear logic, silvery speech, and fluent pen, did so much to expound and defend the truth; and who, as pastor and

preacher, author and professor, condensed into his half-century more work than was achieved by any single contemporary. The editor, who is a respectable divine, is an unskilful biographer. In his attempts at playfulness he only loses his dignity, and in the grandiloquent passages there is more of pomp than majesty. The trite quotations from Horace, so trite as "Periculosæ plenum," &c., "Si vis me flere," &c., "Nonumque prematur in annum," &c., give a pedantic air to the book; and we question if Dr. Wardlaw would have allowed to slip into the "Life" of any friend of his such passages as may be found at pp. 496-500, 35, and the note to p. 76.

After the hundreds of volumes devoted to Syrian travel and topography, we could hardly have expected to find so much that is new and interesting as we find in "Sinai and Palestine in connection with their History," by the Rev. A. P. Stanley. In a minute and delicate descriptiveness, and in the faculty of linking together the sacred text and the existing localities Mr. Stanley is unequalled. The maps of different regions, tinted according to their existing aspect, will be very valuable to those who cannot visit the country for themselves; nor, since the days of Robinson, have we accompanied any tourist with an eye so fresh and so well prepared by previous learning.

Very different, but also very beautiful, is "The Pilgrimage, and other Poems," by the Earl of Ellesmere. To make this a charming book, luxurious quarto and pictorial illuminations were hardly needed; but with these enhancements the entire volume will take a foremost place amidst the poetry of the peerage.

Apropos of the Holy Land, we gladly notice a Map of Palestine and Egypt prepared by Dr. Philip of Alexandria. It is not too crowded, and by simple expedients it gives a good idea of the leading features of the country.

Philosophical readers will find rich materials for thought and reflection in "Typical Forms and Special Ends in Creation," by Professors M'Cosh and Dickie. As in the instance of vegetable forms and colours, many of the facts and observations are new; and the ingenuity and eloquence with which natural phenomena are brought to illustrate the mysteries of revealed religion, give the work a theological importance equal to its scientific value.

The Memoir of Captain Hedley Vicars well deserves the warm welcome which it has already received. "The Birthday Council," by Mrs. Alaric Watts, whilst it will amuse our young readers, will help to make them kind and useful. "The Preaching of Christ," by Mr. J. A. St. John, is the work of a poet; and we have felt a peculiar captivation in its devout, tender, and often highly descriptive narrative. Perhaps the most remarkable publication of last month is a volume of "Lectures on Great Men," by the late Rev. F. Myers. The great men are Luther, Columbus, Xavier, Czar Peter, Wycliffe, More, Cranmer, Cromwell, Savonarola, Ximenes, De Coligny, Washington. Prepared for his Keswick parishioners, these Lectures are a wonderful monument of the genius, the expansive catholicity, and the devotion to his people of their lamented author. And now that this lamp which burned under a bushel is placed on a candlestick, we cannot but ask, Are these his only remains? What like were his sermons? What was his history?

We are happy to record the defeat of Sir Joshua Walmsley's motion to open the National Gallery and British Museum on the Lord's day, by a majority of 376 to 48. We hope that the promoters of the half-holiday movement will now press that measure till an afternoon for innocent amusement becomes the privilege of every citizen, as well as the day of sacred rest.





Encampment of the Frontier Lapianders.

NOTES ON NORWAY.

No. VII.

A VISIT TO THE LAPS. THE FRONTIER. THE ENCAMPMENT. REIN-DEER. A SUPPER AND A NIGHT WITH THE LAPS. THE BIBLE IN THE TENT.

WHEN in Saltdalen, we learnt that there had been an encampment of Laps there a fortnight previously. But as the reindeer do not thrive except on the mountains, their stay was short. Our plans did not admit of our crossing the country to Lapland at that point, or even penetrating to the loftier mountains in Nordland, so that we did not encounter any of this interesting race in their more ordinary haunts. There are, however, farther south in the mountain-range which forms the backbone of the peninsula, scattered parties of them, known as the Frontier Laps. At Hjerkin we formed the resolution to penetrate to the Scandinavian Alps with the view of visiting any of these wanderers that we might be able to discover. The interest attaching to this peculiar people may warrant us in giving a somewhat circumstantial account of this expedition.

The four young Cantabs already mentioned were desirous of accomplishing the same object, and we agreed to travel in company. They were travelling in carriages, the ordinary conveyance of the country. The carriage is after the fashion of a comfortable arm-chair slung on a pair of wheels, and accommodates only one. It is admirably fitted for the hilly roads of the country; and carriage-travelling affords a good deal of the excitement and exhilaration without the fatigue of riding. The addition of four to our party,

with their unique conveyances, was an interesting and agreeable variety, a constant interchange being kept up between the large carriages and the carriages. In truth, where the party is considerable, a mixture of more social carriages with solitary carriages supplies, perhaps, the optimism of the conditions of Norwegian journeying.

Our procession was an imposing one, as we started from Hjerkin in our six conveyances; the merry skydskarls cracking their whips and singing for very glee. We required nine horses at every stage; and as the nine that we unyoked mingled with the nine fresh ones which we found waiting for us in some grassy spot on the Dovre-fjeld, while the red-capped skydskarls hurried to and fro among them, the scene was an animated one. The little horses, for the most part cream-coloured (as is commonly the case through the country), were here very fine; some of them faultless in their proportions and paces.

On the 27th of July, at seven o'clock in the morning, we found ourselves rattling through the streets of Røraas, two days' journey to the south-east of Trondhjem. Our course was one of gradual ascent, through a wild hilly country, and along the banks of a series of mountain-lakes; the wooding being sparse and gradually diminishing as we ascended. After a pleasant drive of some twenty miles, we reached a scattered village at the world's end called Brecken, where we were overtaken by a heavy thunder-storm, a thing of unfrequent occurrence in these latitudes. We found shelter in a small farm-house, picturesquely situated on the banks of a rapid stream: from which, when the storm was over, some of our party supplied us with a dish of beautiful trout, the larder of the farm furnishing milk, potatoes, and "flad-bröd." The farmer's wife had been sick, but was convalescent, a fortunate circumstance, as medical aid is not to be had nearer than Røraas. She

seemed glad of a few kindly words spoken to her about the land where the inhabitant shall not say, "I am sick."

Thus far we had come by a new road, which is being constructed between Røraas and Sweden. It is completed only as far as Brecken. Here, therefore, we left our carriages; and the storm being over, set forth, some on foot, and others on horseback, having brought saddles with us for the purpose, under the direction of our intelligent guide Erasmus. A wild and scrambling track conducted us through low forest and brushwood,—now by swampy flat, and now by rocky elevation to the frontier. It is marked only by a line cut out in the slender birch-wood. The scene was wild and striking, but the Fjelds on either side of us were not seen to advantage, as we ourselves viewed them from an elevation of nearly 3000 feet. Following the course of a mountain-torrent, we at length reached the solitary house called Malmag's-gaard, which serves as a resting place for the traveller. It stands on the margin of a wide and lonely lake. Here all uncertainty as to our success in finding the Laps was banished; for on entering the court, we saw a little old man standing, whose features, stature, and clothing, left no room for doubt as to his being one of this singular race. He was, in fact, from the neighbouring encampment, to which he willingly undertook to guide us. At the same time Cnut (Canute), a boy belonging to the house, of ten or eleven years old, volunteered to accompany us. He was a beautiful boy, the very picture of a mountaineer—with his leathern jacket, his long leathern boots, and his picturesque red cap. The elasticity of his step, the brightness of his eye, the quick intelligence of his remarks, the acuteness of his observation, made this bright little Cnut a very singular contrast to the flat-faced, dull-eyed old Lap, Johan, by whose side he tripped along. Leaving our horses at Malmag, we traversed the marshy hill-side,

which the lake drains, passing the wild saeter of Malmagslige; and after a stiff walk through the low and spiry forest of gnarled birch-wood, we found ourselves upon a rather more open slope of the mountain, which stretched down to the lake below us, and upwards to a great height above us. This was the spot we were in quest of. It was evening when we reached it—the time when the reindeer are gathered in from their mountain pastures to be milked.

The herd belonging to this company amounted to about 300. The Laps do not much like being asked the number of their herd—which is pretty nearly equivalent to being asked how rich they are. A circular space of perhaps forty or fifty yards in diameter was paled in with a rude fence of birch. In this the greater part of the herd were confined, while some, not yet secured, were seen gracefully bounding down the mountain-side. Entering the enclosure, the scene was picturesque and animated in the extreme. The beautiful animals, of all ages, from the sturdy old buck with his towering antlers and haughty bearing, to the frolicsome fawn of a few months or weeks, were moving gracefully about within the narrow limits of their present confinement. One could never weary of admiring the symmetry of their forms and the grace of their movements. Some fifteen or sixteen Laps were busily employed amongst them; and as we looked at the men and the beasts which the enclosure contained, it did strike us as curious that men so low in the scale of humanity as the Laps should be the sole and exclusive masters of so noble a race of animals as those now before us. Here and there a man was seen going about with a light rope, which he threw round the neck of the deer which was to be milked, and with great dexterity and speed passed it round the face of the animal, so as to extemporise a perfect halter. This he fastened to one of the slim birch stems which abounded within as well as without the enclosure,

and one of the women came and milked the animal. The quantity of milk is not great, the whole herd barely yielding enough to fill two copper vessels of very moderate dimensions. In being poured into these from the wooden vessels in which it is first received, it is strained through grass-roots. If, however, the quantity is not great, the quality makes ample amends. It is delicious, being as thick and rich as the best cream, as we found when courteously invited to partake. During the process of milking the young animals were muzzled.

From this we went down to the little encampment. The huts are of very simple construction. Several poles selected from the forest are stuck into the ground, enclosing a circular area of considerable size, so as to approach one another at the top, leaving, however, an open space of three or four feet in diameter for the egress of the smoke. A couple of poles are rudely fastened across, to give some stability to the framework, which is then wattled with twigs of birch, fern, &c. When they remove to a new locality, they of course leave their old huts standing, and a few hours suffice for the erection of their new abodes. They commonly travel in small companies, for the convenience of having separate pasturage for their deer. The encampment at Malmagslige consisted of only two huts. One of them was occupied by a single family; the other by an old man and his wife, with several married sons and daughters, and their children.

Along with another of the party, I had lingered behind the rest among the reindeer. It was past ten, and becoming dusky when we descended to the larger hut; and, lifting aside the reindeer skin which was slung over the small hole left in the side of the hut for a door, we entered, and squatted ourselves in the midst of as picturesque a group as

could well be imagined. A large fire of green birch-wood blazed and crackled on the ground in the centre of the hut, while its smoke, finding tardy egress through the aperture above, sadly tried the eyes of those uninured to such an atmosphere. Around the fire the ground was covered with a thick carpeting of fresh birch-leaves, the fragrance from which was very agreeable. Upon the leaves were laid reindeer skins; and upon these the occupants of the hut, numbering seven-and-twenty, not to speak of numerous dogs, when we entered, were seated in a ring with their feet to the fire. Some of our party were busy distributing among them various little articles,—tobacco, needles, thread, &c.,—which we had brought for the purpose, to the great and exuberant delight of the Laps. On receiving any present, the receiver invariably rose and gave the donor a hearty shake of the hand—a custom which indeed is common to them with the Norwegians and the Swedes. It was not a little striking to come suddenly upon this scene, and to mark the features of the motley group as they received the welcome gifts brought them, while the dancing flame shed a wild, lurid light on the inmates of the hut; and on the addition of new wood, the eddying smoke more than half concealed their countenances and figures. Right opposite the door, and apparently in the place of honour, sat old Andes Monsa, the patriarch of the party, who is treated with marked deference by all, no bargain being concluded nor matter settled without consulting him. The exclamation which burst from this worthy little chief when we first approached the huts was characteristic enough. Surveying us from head to foot, and from side to side, he exclaimed, “Tall travellers! large strangers!” in compliment to our stature, which certainly did contrast curiously with theirs. They had never before been visited by English ladies; and

those of our party were the objects of great admiration, and of most minute and detailed inspection on the part of the female Laps.

Seeing a handsome reindeer-skin hanging outside the hut, over some reindeer cheeses, I asked one of the women if it could be sold. "She could not tell, but she would see what Andes said."

Old Andes was now sitting amongst his tribe, directing their proceedings, and expressing unbounded delight at the gifts they were receiving. He then volunteered to give us a song, which the old man executed with wonderful spirit. It was Swedish, however; and as we were anxious to hear their own Lapsk airs, he called on two of the women to gratify us. They accordingly joined in singing two of their native melodies—strange wild *lilts*, with little air in them. They then commenced, of their own accord, a Swedish Psalm, somewhat to our surprise. When it was done, we asked them, "Are you Christians, then?" "Yes." "Do you go to church?" "Yes, when within reach of one, which, however, does not often happen." "Have you a Bible?" One of the singers rose, and, from a reindeer-skin pouch, produced a Swedish Testament, published at Stockholm. They assured us that some of them often read it.

Andes then called to him, from a group of several children, a little grandson of seven years old, and asked him to repeat something, which we at once recognised to be the Lord's Prayer in Swedish. It was with a thrill of peculiar and unexpected delight that we heard this child of the mountains lisping the familiar accents of "Our Father, which art in heaven." We had felt before a kind of sorrowful pity for them, as beings low in the scale of humanity. But now, seeing one with the Book of life in her hand, and another with the words of life in his lips, such feelings began to shade off into the animating hope, that through like pre-

cious faith, we might meet with some of these poor Laps in heaven, advanced, elevated, purified, as we ourselves need to be; and rescued by that power which can change the heart of a Lap no less than of a Briton.

It is pleasing to know that these poor wanderers, so long neglected, have at length attracted the interest and attention of Swedish Christians; that a few of themselves have been tamed and trained, and sent forth as roving schoolmasters; and that Bibles and tracts are circulated amongst them. They received with gratitude some tracts which we left with them. But as yet it is only the edge of the wedge which has found entrance.

As we have remarked, their stature is very small, not much exceeding four feet. They have no pretensions to beauty, their faces being broad, their mouths wide, their noses little, their eyes invariably tender (perhaps from the effects of wood-smoke), and frequently with a cast in them; their hair lank, and not initiated in the mysteries of the comb, and their complexion of a dirty yellow.

Their clothing is in general made of reindeer-skin, and is much the same for both sexes. They wear a kind of long skin tunic, girded round the waist, a small skin cap, long skin-boots; and some of them, skin trousers. And thus attired, they present a singularly picturesque appearance. The invaluable reindeer supplies them not only with dress, but with food. Of the milk they make butter and cheese, which they seem to use without bread. The milk is a chief element, too, in a kind of porridge which they make. They sup their gröd with spoons of reindeer horn, and sew their garments with thread of reindeer sinew.

As the night wore on, Andes hung a huge pot over the fire, into which he put equal quantities of reindeer's milk and water, and throwing in two or three handfuls of barley-meal and salt, he boiled the mess well, and the result was a

very delicious and rich porridge, of which we partook along with them. Thus, in summer, they need little more to support them than the milk of their herds. In winter, when the milk is scanty, they live mainly on the venison they supply. The life of these wandering tribes must be hard in winter; but even then their faithful reindeer stand them in good stead. Yoking them to sledges they are able to descend to the mountain-villages, to procure meal in exchange for venison, baskets, or what else they may have. I know not that they attempt anything more arduous in the way of industry than basket-making, and this, probably, to a very small extent. One old female Lap we met, with several peculiar prongs made of reindeer horn, which, she told us, were used in basket-making. By a beautiful provision, when the grasses are all dried up with the severity of winter, the mosses and lichens flourish, and on the loftier mountains, when the snow is cleared away, they are sure of adequate pasturage for their herds, even in the rigour of their northern winters, so abundant is the "reindeer moss," which the animals reach by scraping away the snow with their hoofs.

It sometimes happens that the winter sets in with heavy rains. The soaked surface is immediately congealed, and the reindeer moss is encased in a crust, which the deer cannot penetrate. In such a case, the Laps are reduced to the necessity of felling pines that the poor animals may glean a scanty subsistence from the lichens and liverworts which grow upon their trunks and branches.

In spite of the exposure and hardship the Laps must endure in their wandering life, and the length and severity of winter, it is marvellous to see what an age some of them attain. Andes was seventy-five, and his wife at least as old; and another aged couple, who were absent from the encampment, we encountered next day; they were both

about eighty. An attempt has been made in some quarters to impose a tax upon the Laps for the fitful and migratory use they make of the mountain lands,—which belong, in some cases, to the Government, and in others, to the parochial authorities. No great success, however, has attended this attempt; and one effect of it has been to make the Laps in some parts view with great jealousy the approach of any man one or two feet taller than themselves, lest he should prove to be a tax-gatherer. On such occasions, they have frequently been known to make a sudden retreat to some distant mountain. In point of fact, most of them enjoy entire immunity in their mountain homes. They are very harmless, rarely committing any offence that brings them under the operation of the criminal law of the country. We heard so much of a murder, said to have been committed by a party of them under provocation some years ago, as to make it clear that such a thing was of very infrequent occurrence. In their communications with one another, they speak exclusively in “Lapsk.” It is a singular language, sounding strangely on the ear, from the profusion of its vowels and its gutturals. It is said to be allied to the Asiatic languages, thus giving indication of the Eastern origin of these tribes. They can also speak a rather barbarous dialect, which is a cross between Norsk and Swedish, by means of which they make themselves intelligible to the borderers on either side of the frontier, and through which we were able to communicate with them.

The poor Laps are despised by both Swedes and Norwegians, being looked upon as an inferior race, with whom it is reckoned degrading to have much intercourse. Hence, perhaps, the marked pleasure with which they received us. The interest we manifested in them was an interest we really felt. When invited by them to spend the night in their hut,—as had been done, they told us with great satisfaction, by two

English gentlemen ten years ago,—five of us willingly assented to the proposal, the remainder of the party returning to Malmags-gaard. We thus had the opportunity of getting a little further insight into their habits, and shared with them in the reindeer milk “gröd” (porridge), which formed their evening meal. For my own part, I can testify that I never enjoyed sounder sleep on a bed of down than I did that night, stretched upon the fresh-strewn birch-leaves, with my head upon a reindeer-skin pillow, and my feet close to the blazing fire, amidst our wild but hospitable entertainers and their dogs, who seemed to slumber as profoundly as ourselves; though it must be confessed that we had but a chilly awakening, the fire having entirely gone out, and the result of our scramble through the marshes of the hill-sides being that our limbs were left in a tolerably soaked condition. The *coup d’œil* I got before falling asleep, through the smoke of the birchen fire, of the prostrate company, stretched under their reindeer-skins, while old Andes still sat erect, as if in conscious guardianship of the clan, was one which I shall not easily forget. And from more than one heart among us, ere we went to rest, I believe the prayer went up to heaven, that these wanderers might be made the servants of the Lord and of His Christ: subjects of that kingdom “where there is neither barbarian, Scythian, bond nor free, but Christ is all and in all.” We were astir betimes in the morning, and after paying a visit to the other hut, and purchasing a few reindeer-skins, and spoons of reindeer-horn, as memorials of our interesting friends, we took leave of them. This despised race is diminishing, and is said not now to exceed 13,000 in Norway and Sweden.

R. H. L.

EGYPT : ITS ARCHITECTURE, SCULPTURE, AND PAINTINGS.

THE subject* we will first select for comment is sculptured on some invariably conspicuous part of almost every temple throughout Egypt and Nubia, whether built during the reign of the Pharaohs, the native kings of Egypt, or of their successors, the Ptolemies, the Greek kings who governed the kingdom after the death of Alexander the Great: it represents *the king, assisted by the chief divinity of Egypt, destroying the enemies of the country.*

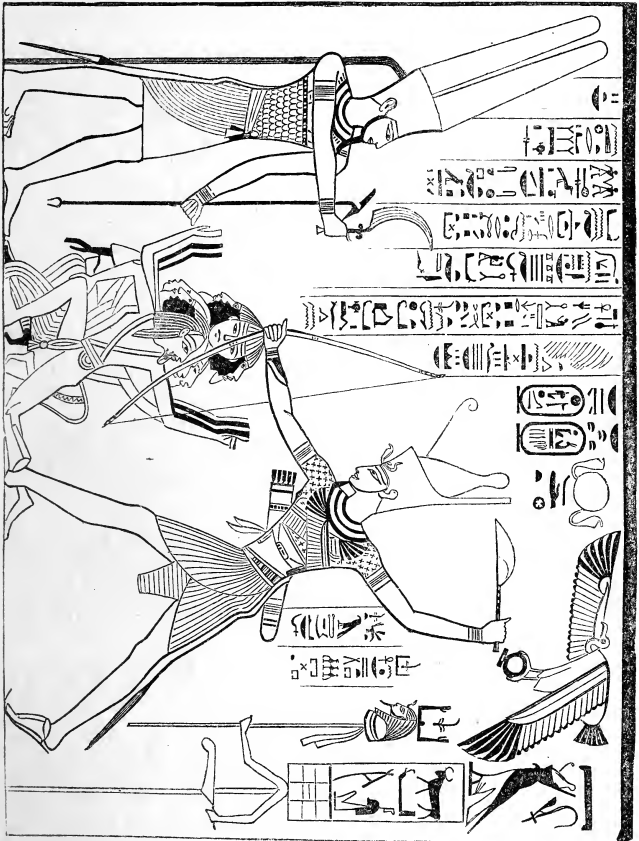
The king Rameses II. (who is commonly supposed to be the great Sesostris) is represented in the attitude of striking off the collected heads of the various nations he has subdued. In his left hand he holds a bow, and by the hair of the head eleven persons, all in actions of supplication; while the upraised right hand holds the falchion. The mode of representation presents an example of the peculiarity we have previously pointed out of avoiding the back view of the figure—for, in order to preserve the front view, the left hand is converted into a right one by the expedient of turning it so as to conceal the fingers, which must necessarily have been exhibited were it the left hand.

The group of figures held captive by the king is a curious ethnological illustration, showing as it does the varieties of peoples subject to the sway of Sesostris, whose empire extended over Thrace, Ethiopia, Lybia, Egypt, Arabia, and the Islands of the Red Sea. We have here before us the various complexions and forms of feature not

* A copy is exhibited at R. 4. on the wall of the Inner Egyptian Court of the Crystal Palace.

only of the tribes to the south and bordering on Egypt, but of those of the most remote boundary to the north-east and

Fig. 8.



south-east. There are three descriptions of blacks—two apparently being negroes from different districts of Central

Africa,—while the third, though still a black, has an aquiline nose, and the countenance of an Abyssinian. One figure is of a dusky brown colour, another is red and possesses a Jewish contour, while the rest are all of fair complexion, varying from copper and pale yellow to the most delicate shades of pink. These are all equally distinguishable by the forms of their noses—some being quite straight, and others more or less aquiline, one being especially remarkable for a tawny yellow skin, long hooked nose, and very retreating forehead.

Behind the king is the royal and sacred standard, and before him stands the chief divinity of Thebes, Amun Ra, who extends the sword of conquest, saying at the same time (as the hieroglyphics over his head inform us), “I give thee dominion over all countries.” The god is of the ethereal substance as signified by his blue complexion.

The entire picture is a most striking example of that unity of idea so often found to exist between the language of Sacred Writ and the sculpture of Egypt. It is difficult to imagine a more literal embodiment of the language of the 40th and 41st verses of the 18th Psalm: “Thou hast also given me the necks of mine enemies; that I might destroy them that hate me. They cried, but there was none to save them: even unto the Lord, but he answered them not.”

No language can express more clearly, or describe more accurately, the sculpture before us; and we are consequently led to inquire whence came this remarkable affinity of ideas, and to what is it referable? For our own part we consider that it is derivable from that one primitive language, or mode of communicating thought which existed before the dispersion of the great human family; for their immediate descendants were the fathers of the races which peopled the countries in whose literature and art we find such decided similarities of conception.

In evidence of the universality of this subject on the walls of Egyptian Temples both as to time and place, we may refer such of our readers as may have an opportunity of visiting the Crystal Palace, to the series of photographic views in Egypt in the gallery over the Hall of Columns, where they have been placed for the instruction and admiration of those who desire to become better acquainted with the stupendous works of this extraordinary people, from whom all civilised nations of the earth have derived so much knowledge in the arts and conveniences of life.

These indisputable documents, the photographic transcripts of the records executed by the ancient Egyptians themselves, prove not only the frequent repetition of this particular subject, but also the similarity of treatment in every example from the very earliest to the most recent date. The first example we shall select for observation is found on the towers of a gateway at Thebes,* built during the reign of Amunothph II., who was probably the contemporary of Moses.

The next representation of the subject is in a view of the towers of the gateway of the Temple of Edfou,† built during the reign of Ptolemy Euergetes II., 145 years before the Christian era. Continuing our course towards the colossal figures, or southwards (for the photographs have been placed geographically), we shall arrive at a view of the great gateway of the Temple of Isis, built by one of the last of the Ptolemies in the Island of Philæ,‡ on the towers of which the same subject is sculptured with slight modification. And now if we cross the frontier of Egypt, and pursue our journey in the gallery of the Crystal Palace into Nubia, we shall find at Wady Seboua § again the same subject engraved on the towers of the gateway of a

* Phot. No. 65.

† Phot. No. 75.

‡ Phot. Nos. 95-97.

§ Phot. Nos. 131, 132.

temple built during the reign of Pharaoh Rameses II., about 1200 years before our era. One more example we will quote, because it forms an exception to the general rule, and does not occur on the towers of a gateway, but in an inner chamber of a temple at Derr, built by Rameses II.*

The representation is partly intercepted from view ; but the raised arm of the king, and part of the figure of the god Ra, who in Nubia often takes the place of the god Amun, are visible on one side of the pier.

We have now seen, by the unimpeachable testimony of these photographs, that both in Egypt and Nubia this identical subject occupies a conspicuous place in almost all the temples that were built during the reigns of the native kings, the Pharaohs, and likewise in those built during the rule of the foreign or Greek kings, the Ptolemies ; but, besides the examples here quoted, almost every existing temple contains a copy of the same subject, similarly placed at the entrance.

The particular example of the subject which has been chosen by the architect of the Egyptian Court, is accurately copied from one sculptured on each side of the door on the wall within the great Temple of Aboo Simbel, of which extraordinary excavation the Directors have not only supplied several photographic views and lithographs, but also a model of the exterior, to a reduced scale, and a restoration of two of the figures the full size of the original.†

The principal reasons for selecting the illustration from the Temple of Aboo Simbel in preference to any of the other existing remains, are that there is no other example throughout Egypt and Nubia so perfect in all the colours of the figures, and altogether so well preserved, and because that particular specimen of Egyptian painted sculpture is of the

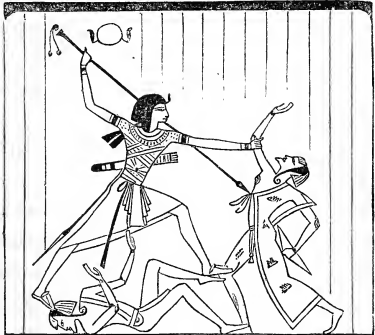
* Phot. 140.

† See colossal figures in North West Transept.

age of Rameses II., whose name appears on the adjacent columns in the Crystal Palace. To have been strictly in accordance with the usual practice of the ancient Egyptian architects, the corresponding space at the other end of the portico should have been decorated with the same subject; but the modern Egyptian architect (Owen Jones) has most judiciously avoided this repetition, and has availed himself of the opportunity for additional instructive illustration by giving in its stead another Egyptian design, taken likewise from the interior of the same great Temple of Aboo Simbel.

Fig. 9.

This subject exhibits the king contending with two men of large stature, light complexion, scanty beard, and having a remarkable lock of hair pendent from the side of the head.



The king is in his early manhood, as we gather from the youthful appearance of the whole figure, and from the absence of that square black appendage usually attached to the chin by a band which we see on all Egyptian statues of full-grown living men; nor has he that attribute of Osiris, the curved beard, distinctive of all posthumous statues whether of kings or other men. Instead of either of these modes of expressing the beard, there is an indication of the natural beard conveyed by a multitude of small lines on the upper lip and chin. The head-dress of the king is of the form of one in the British Museum, made of hair, but to it is added the distinctive mark of royalty—the Ureus, or sacred asp; and from the back of the wig float two scarlet

ribands. Around his neck is a broad golden necklace worn over a tight-fitting, richly-decorated kind of vest, which terminates just below the shoulder at the upper armlets. The vest, and the fine linen tunic which appears underneath, are confined at the waist by an embroidered belt with its royal appendages; and from the back proceeds the imitation cow's tail worn by the monarch as a votary of Isis. Besides the armlets and the bracelets the left wrist is protected from the recoil of the bow-string by a golden plate enamelled with blue and green ornaments. The sandals of the king turn up like skates or snow-shoes, and are of a kind well known to us through many specimens in the British Museum and elsewhere. This would complete the description of the royal attire but for one very curious and interesting particular, which we have purposely left to the last, as it seems heretofore to have escaped the notice of Egyptian students; we allude to the embroidered bandage worn over the tight-fitting vest, and which we shall term a *military fascia, or bandage*, because it is found only on figures in warlike costume. This band proceeds from under the necklace, and having apparently been passed over the shoulder, is made to encircle the chest several times, being finally secured in front a little above the waist-belt.

One of these curious fasciæ, or bandages, was brought to England a few months ago; and, as we apprehend that it has been the only one ever seen here, it is worthy of detailed description.

The band was of woven linen and sixteen feet in length. At its widest end, which was four inches and seven-eighths in width, were two loops; while at its narrow end, which was only two inches in width, were the threads of the warp twisted into six strings, seven inches long. The band was curiously woven with certain Egyptian emblems and lines, which maintained their relative proportions as they diminished towards

the narrow end. The entire space down the middle was unoccupied by this symbolic ornament; but near the wide end of the plain stripe was written,—not woven like the other characters, but *written*,—in very legible hieroglyphics, the name of a successor of the king whose heroic deeds are displayed in the picture we are describing. No one has hitherto appeared to divine the intention of this curious relic of antiquity; but we venture to believe, that, on comparing it with our picture (fig. 9), there can be little doubt regarding its real use. The object of this bandage must have been to brace up, and “gird with strength,” as it were, the muscles of the back during violent action, by affording a species of fulcrum against which they would act with increased vigour. Here, again, in this Egyptian picture, is another embodiment of the metaphors of the Psalmist (Psalm xviii. 38, 39): “I have wounded them that they were not able to rise: they are fallen under my feet. For thou hast girded me with strength unto the battle; thou hast subdued under me those that rose up against me.”

This “girding with strength” is also an Egyptian idiom, for we find the representation of the buckle or fastening of the girdle used as a hieroglyphic signifying strength, clearly suggesting its derivation from the custom of girding the loins with a shawl, or long piece of cloth, before undertaking any work in which bodily exertion was required. For the same reason were the Israelites commanded to eat the passover with their “loins girded,” (Exod. xii. 11), that they might be ready immediately after to commence a journey.

The youthful hero, Rameses, is in the action of trampling upon one of his assailants, while he inflicts a deadly wound upon the other by thrusting his spear into the region of the heart. Here we must pause to point out that the spear, which properly should pass before the face of the

king, is made to pass behind it, in observance of a law in Egyptian art which requires that the less worthy object should not be represented to the prejudice of the more worthy.

The large stature of the people with whom the king is contending is a marked peculiarity, for this is the only composition in which the enemies of Egypt are represented as approaching their conqueror in size. The one whom the king is in the act of striking is clad in a long robe, while the vanquished foe whom he treads under his foot has only a scarf round his chest and loins; but both have the pendent lock of hair, and have their skins painted or tattooed, forcibly recalling the ordinance in Leviticus, xix. 27, 28: "Ye shall not round the corners of your heads, neither shalt thou mar the corners of thy beard. Ye shall not make any cuttings in your flesh for the dead, nor print any marks upon you:" and also xxi. 5, "They shall not make baldness upon their head; neither shall they shave off the corner of their beard; nor make any cuttings in their flesh."

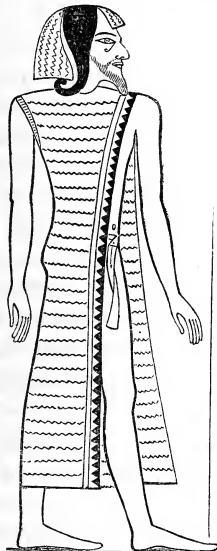
These injunctions were given by the great lawgiver to the people of Israel, lest they should learn the superstitious customs that prevailed in the land they were about to occupy, and thus lose their peculiar and distinct character as a nation.

The people so remarkable in dress and so unusual in dimensions are repeatedly met with in representations of the various nations of the world with whom the Egyptians were acquainted. Exactly the same composition as we have now under notice is sculptured on the north wall of the Temple of Karnak; but the feat of arms is, in that instance, attributed to Oimeneptah I., the grandfather of the hero of our picture, thus corroborating the notion that the deeds of many Egyptian kings were attributed to Rameses II., the Sesostris of the Greeks.

Delineations of the same people occur in several of the royal tombs of Biban-el-Moluk ; and they are likewise represented on the north face of the south wall of the court of Medina Tabou, as brought in great numbers to Egypt on the return of Rameses III. from his conquests over various white races of men.* From this curious historical document, it would appear that the Egyptian king, after some great battle against these people, while still in his war-chariot, receives the prisoners and superintends the counting of the slain by

Fig. 10.

the enumeration of their hands brought from the battle - field and piled in heaps before him. The name of this people is not given in the hieroglyphics accompanying the sculpture at Aboo Simbel, but it occurs in the basso-relievo representing the same incident sculptured on the north wall of Karnak, as well as in the remarkable



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picture in the royal tomb opened by Belzoni, in which these people are seen in juxtaposition with Ethiopians, Egyptians, and another race of white men, and are represented as half a

* See left-hand wall of the Egyptian Court of the Crystal Palace, B. 1, and also Rosellini and Champollion.

head taller than either. In this picture also they are painted of a light colour, with blue eyes and red beard: they wear the same kind of long dress as in the example we have given (Fig. 10), and bear the same name. The differences are, that those of Belzoni's tomb are tattooed on the arms and

Fig. 11.



legs, and that they wear two ostrich-feathers in their heads (Fig. 11): these feathers also occur in the repetition at Karnak. The question now naturally presents itself, as to who may be these people possessing such distinguishing characteristics? Our own conjecture is, that they are a tribe of the gigantic races

that occupied Canaan on the north-eastern frontier of Egypt at the time of the Exodus, and to whom the men sent by Moses to spy out the land, compared themselves as grasshoppers, Numbers, xiii. 33, "And there we saw the giants, the sons of Anak, which come of the giants; and we were in our sight as grasshoppers, and so we were in their sight." (Deut. ii. 10, 11; ix. 2.)

In support of our hypothesis, we will briefly recapitulate the more salient points of the foregoing description.

First. That the gigantic stature of this people is maintained in all the representations of them on the walls of different temples, and that their characteristics are so uniformly sustained as to leave no doubt that the Egyptian artist intended to convey the idea of the same, and that, a larger race of people.

Next. That this race was from the north-eastern frontier of Egypt, their complexion and the hieroglyphic accompanying the painting on the walls of Medina Tabou, fully confirm.

Thirdly. That this people printed or tattooed marks upon their arms and legs, we learn from the representation of them in Belzoni's tomb, and that they rounded the corners

of their heads, or made bald certain parts of their heads, suffering other parts of their hair to grow long, and apparently marred the corners of their beard, we ascertain from every one of the various representations we have cited.

That the people to the north-east of Egypt pursued these practices, we gather from the passage we have quoted from Leviticus; and although the Scripture does not expressly say that the giant sons of Anak "made cuttings," or "printed marks," in their flesh, yet there is every probability that they did so in common with the other inhabitants of Canaan,—that the custom, in fact, was prevalent throughout the land,—or why were the Israelites so strictly admonished against it?

In conclusion, it only remains to offer such further evidence as language affords, by examining the few hieroglyphics contained within the two perpendiculars at Fig. 10, and we trust that our explanation will not be the less interesting from showing the strong affinity which exists between the grammatical structure of the Hebrew and of the ancient language of Egypt.

For the purpose of elucidating the inscription, we have at Fig. 10 placed a line of capital letters opposite to the equivalent hieroglyphic characters, and by the side of these the letters which express the same two words in Hebrew. The vowels are supplied; for in the ancient writing of Egypt, as in the ancient Hebrew the vowels are most frequently not expressed.

The first word, then, of this inscription is RaNTeN. The corresponding word in the Hebrew, SeMKeN, is written with the same number of letters, including in the one word, like the Egyptian, the pronoun "your," showing that the grammatical structure of both the Hebrew and the Egyptian languages admits of the pronoun being attached at

the end of a word. The three bars which follow in the hieroglyphics merely form a sign that the preceding word (the possessive pronoun "your") is in the plural number. The next word in the hieroglyphics is eNTaNMaHU, equivalent to the Hebrew eMTaLMaI—that is, of or from among the Talmai. The remaining signs in the hieroglyphic legend—namely, the figure of a man and three bars are nothing more than the determinative of the word Tanmahu; that is to say, it determines the word to be a proper name, and in the plural number—men, or family of men, so that the entire sentence reads, "your name is Tanmahu."

And now, if we turn to the 22d verse of xiiiith chapter of Numbers, we shall find that among the tribes of the children of Anak, one was named the Talmai, the letters of which word have a great affinity to the letters which compose the Egyptian word TaNMaHU—the consonants in both are the same, if we except the change of the L for the N—liquids which are so constantly interchanging that we may reasonably infer that the word TaNMaHU was but the Egyptian rendering of the Hebrew word Talmai. If we add to this similarity of letters the remarkable characteristics of the people in the paintings,—viz. the curious printings or tattooings on the arms and legs—the scanty beards and rounded corners of the head, as expressed in the Sacred Text, with the circumstance of the injunction which was given to the Israelites just before their entrance into Palestine, on the borders of which these people were located, we have a large amount of circumstantial evidence that we possess in these pictures a fair representation, in the Egyptian style, of that tribe of the Anakim; and what is of more importance, a corroboration of the statement in the Book of Numbers, derived from documents coeval with the facts they announce.

THE OLDEST CHRISTIAN HYMNS.

THE most ancient memorials of Christianity are, happily for us, recorded by the pen of inspiration, and extend over the first century, — from the advent of our Lord to the close of Revelation in the ninety-sixth year of the Christian era. Their value is not a little enhanced by the scantiness and uncertainty of the documents of the second century. In contemplating the worship of the early Church, it is seen that the first part of the grand service of Christianity on earth was Praise. It was introduced by the Virgin's Magnificat, taken up by the Benedictus of Zacharias, carried on by the Angelic Chorus, and completed by the Nunc Dimittis of the venerable Simeon. After an interval of thirty-three years, occurred the next memorable instance at the first Communion, "when our Lord and His disciples sung a hymn;" and whether it was the usual Passover hymn, consisting of the Psalms 113th to the 118th, or was some unknown solemn strain, still that holy Requiem of a dying Saviour is not only an affecting incident, but an attractive precedent. The apostolic band, too sad in their bereavement for praise, gave their first lonely days to prayer; but the Pentecostal converts, in the new joy of piety, broke forth in their old accustomed manner, and "continued with one accord in the temple praising God." When "the Apostles lifted up their voice to God with one accord" (Acts, iv. 24-30), whether they sang the words they uttered is not stated, yet the spirit of the passage is quite in the elevated style of a hymn. There can, however, be no doubt of the use of music in the prison at Philippi, when "at midnight Paul and Silas prayed and sang praises to God, and the prisoners heard them." To apostolic practice is

added precept. The churches at Ephesus and Colosse are exhorted "to teach and admonish one another in psalms, and hymns, and spiritual songs, singing with grace in your hearts to the Lord;" and, adds the Apostle James, "Is any merry? let him sing psalms." Last of all, the book of Revelation, written about A.D. 96, is full of singing, and "a new song" is often foretold of gladsome future times, indicating a practice which had already begun and would never end.

Passing from inspired records, we soon come to unaided human testimony; and the first witness is not a Christian, but the Roman governor of Bithynia in Asia Minor, the philosophic Pliny, who corresponded, in A.D. 103, with the Emperor Trajan, on the treatment of the Christians in his province; and in stating the information he had gathered about them, he wrote, "They affirmed that this was the utmost of their fault or error, that they were accustomed to meet on an appointed day before it was light, and to sing among themselves a hymn to Christ as God."

Our space does not allow us to adduce the interesting quotations on this subject which may be gleaned from the early Fathers, but the substance of them is thus briefly given by the great Church historian, Neander: "Church psalmody passed over from the Synagogue into the Christian Church. For this purpose were used the Psalms of the Old Testament, and also hymns composed expressly for this object, especially hymns of praise and of thanks to God and to Christ."

But here the inquiry naturally occurs, What remains to us of that early germinating time of piety? As the Christians of the primitive churches felt the psalms were unequal to the expression of all their Christian faith and feeling, by what spiritual songs did they supplement this conscious want? How many of those hymns, used in public service,

are preserved? It will be rather disappointing to be told that only one or two survive the wreck of the first three centuries. Only one of these, called the Morning Hymn, is adapted to public worship. With it are connected two short Evening Hymns of a more private nature, one of which is little more than a doxology, and the other appears to be an abbreviation or echo of the longer one. The one or two poetical compositions ascribed to Clement of Alexandria resemble private odes more than hymns for a congregation. After long research, Bunsen has confidently affirmed, that "this is all we possess of authentic and genuine of the ante-Nicene psalmody and hymnology of Christendom."

The means by which our Morning Hymn has descended to us, it may now be well to point out. It has been conveyed in three or four channels. The first to be mentioned is the oldest copy of the Bible in the kingdom, and whose only rival is another of similar age kept in the Vatican library at Rome. Of these two oldest copies of the Scriptures in the world, the one deposited in the British Museum is known as the Alexandrine Codex, from its origin being attributed to the learned city of Alexandria in the fifth or sixth century. In this complete copy of the Bible in capital Greek letters, there is at the end of the Psalms a peculiar collection of 14 hymns of Scripture, with this one ancient hymn of the Christians as the last. Another text is given by Ussher, in the Appendix to his "Dissertations on the Symbols," drawn from various old Manuscript Psalters, which he describes. A third copy is contained in an early directory of duty and worship, called "The Apostolic Constitutions," which professes to be based on tradition handed down from the apostolic age, and was a work most probably of the second or third century.

The interval between the probable date of the Apostolic Constitutions and that of the Alexandrine Codex, is filled

up by a chain of witnesses to the use of this hymn in the Eastern Churches, both before and after the celebrated Council of Nice, in A.D. 325. A Latin version also affords a strong confirmation of the antiquity of the Greek original, which was translated into Latin by Hilary, bishop of Poitiers, in the middle of France, A.D. 350 to 370. He is considered to have been the earliest writer of Christian hymns in Latin, although he was contemporary with Ambrose, who attained to greater eminence in this style of composition. Most of the Latin hymns are original, and few, if any, beside this one are translations. The version of Hilary is very literal, scriptural, and simple, and is given that it may be compared with the Greek.

Much curious information, in the German style of research, is collected by Dr. Daniel of Leipsic, in his "The-saurus," from which the following particulars are extracted. The first words of the hymn "Gloria in excelsis Deo, et in terra pax, hominibus bonæ voluntatis," are said to have been used in Rome as early as by Telesphorus, the bishop of the Church in that city (A.D. 128 to 138); but there is no proof of the remainder being rendered into Latin before the time of Hilary. The version by him is the more probable from his banishment from Poitiers to Asia Minor on account of his zeal against Arianism, which was favoured by the Roman emperor; and in the East he would meet with this hymn, and find it a powerful weapon against his opponents, from its ascription of divine honours to the Son. After four years spent in exile, his earnestness led the Arians of Asia to request his removal, and he was allowed to return to his own Church, where he wrote works which attest his ability and justify his eminence. While it is reported that Symmachus, bishop of Rome, in A.D. 514, employed the hymn on Lord's days and the festivals of Martyrs, further directions were laid down by Gregory the Great, A.D. 590 to 603, who

revised the musical part of the service and composed the Litany. His rule was, "At first the Antiphon at the commencement of the service, as it has been at stated times, either on festivals or every day. Then the Kyrie eleison. After it the Gloria in excelsis Deo. If a bishop preside, it is to be used only on the Lord's day or festival days; but if a presbyter be present, only at the Paschal feast (or Easter, as it is called in Northern Europe). When, however, the Litany is performed, neither the Gloria in excelsis Deo nor the Alleluia is sung." This order is still observed, as may be seen in any of the masses, set to music by Mozart and many others, in which this hymn is the second in the service.

At the Reformation, among the few things retained from the Romish Liturgy by Luther, this most ancient hymn stood its ground and took its place in the German service, where it is still used in all Lutheran churches. By the great Reformer it was "*summ̄is laudibus exornatum,*" and two or three versions of it in German are in general and popular use. It may not be known by many, that in a prose form it is inserted in the Communion Service of the Church of England, before the Benediction, and is given below, where it will be seen to have been translated from the Latin, and not from the Greek, when the Prayer-book was compiled by some of the Reformers in 1547. A metrical version of it, in which the words in the Communion Service are very closely followed, was published (A.D. 1696) by Tate and Brady, and is the last but one among their hymns at the end of their Psalter. Another attempt at a versification of it is added, and some of our readers may be induced to try their poetic skill upon the same relic of antiquity. It may be satisfactory to some to be put in possession of the opinion of the late eminent Dr. J. Pye Smith, which he recorded in a note of his learned work, "The Scripture Testimony to the Messiah." "Of these venerable and simple composi-

tions, two remain. The Morning Hymn has been transferred (as have been many other invaluable fragments of the devotions of Christian antiquity) into the Liturgy of the Church of England. The Evening Hymn is the one referred to by Basil. The common use of songs of praise like this is a striking evidence of the general faith of Christians in the age when they prevailed." "I cannot but think that there is great weight in the argument in favour of the popular orthodoxy of the earliest age, from the hymns, which, we have evidence for believing, have descended from an antiquity little, if at all, short of apostolic." This argument against Unitarianism may be used also against Roman Catholicism, as both are at variance with this hymn—the former by denying the Divine honour it ascribes to our Lord, and the latter by admitting the saints to the prayers which are here reserved for the adorable Trinity alone. But why should it not be received by other Protestant Churches, as well as by the Episcopalian and Lutheran, from its congeniality with their spirit and sentiments, by which it evinces their agreement with apostolic faith and primitive devotion? Bequeathed by an age anterior to the Romish corruption, it belongs to all churches that find in it the utterance of their own faith and the echo of their own heart. With a source that seems to lie close upon, if not quite within, the apostolic age, and a truth that may well flow from apostolic light, there is a rare charm in a hymn that enables us to use the very words and think the very thoughts that cheered and soothed the earnest hearts of the earliest members of the Universal Church.

Ἕμνος ἑωθινος.

Δόξα ἐν ὑψίστοις Θεῷ,
 Καὶ ἐπὶ γῆς εἰρήνη,
 Ἐν ἀνθρώποις εὐδοκία.
 Αἰνοῦμέν σε, εὐλογοῦμέν σε,

Προσκυνοῦμέν σε, δοξολογοῦμέν σε,
 Εὐχαριστοῦμέν σοι διὰ τὴν μεγάλην σοῦ δόξαν,
 Κύριε βασιλεῦ ἱπουράνιε,
 Θεὸς Πάτερ παντοκράτωρ,

Κύριε υἱὲ μονογένης, Ἰησοῦ Χριστὲ,
 Καὶ ἅγιον Πνεῦμα·
 Κύριε ὁ Θεὸς, ὁ ἄμνος τοῦ Θεοῦ, ὁ υἱὸς τοῦ Πατρὸς,
 Ὁ αἴρων τὰς ἁμαρτίας τοῦ κόσμου, ἐλήησον ἡμᾶς·
 Ὁ αἴρων τὰς ἁμαρτίας τοῦ κόσμου, πρόσδεξαι τὴν δέησιν ἡμῶν.
 Ὁ καθήμενος ἐν δεξιᾷ τοῦ πατρὸς, ἐλήησον ἡμᾶς·
 Ὅτι σὺ εἶ ὁ μόνος ἅγιος, σὺ εἶ ὁ μόνος κύριος,
 Ἰησοῦς Χριστος, εἰς δόξαν Θεοῦ Πατρὸς. Ἀμήν.

Καθ' ἐκάστην ἡμέραν εὐλογήσω σε,
 Καὶ αἰνέσω τὸ ὄνομά σου εἰς τὸν αἰῶνα τοῦ αἰῶνος,
 Καταξιώσον, Κύριε, καὶ τὴν ἡμέραν ταύτην
 Ἐναμαρτήτους φυλαχθῆναι ἡμᾶς·
 Εὐλογητὸς εἶ Κύριε ὁ Θεὸς τῶν πατέρων ἡμῶν,
 Καὶ αἰνέτον καὶ δεδοξασμένον τὸ ὄνομά σου εἰς τοὺς αἰῶνας. Ἀμήν.

Εὐλογητὸς εἶ Κύριε διδάζόν με τὰ δικαιώματά σου
 Κύριε καταφυγὴ ἐγενήθης ἡμῖν ἐν γενεᾷ καὶ γενεᾷ
 Ἐγὼ εἶπα· Κύριε, ἐλήησόν με·
 Ἰασαι τὴν ψυχὴν μου ὅτι ἥμαρτόν σοι·
 Κύριε, πρὸς σε κατέφυγα.
 Δίδαζόν με τοῦ ποιεῖν τὸ θέλημά σου, ὅτι σὺ εἶ ὁ θεὸς μου,
 Ὅτι παρά σοι πηγὴ ζωῆς·
 Ἐν τῷ φωτί σου ὀψόμεθα φῶς·
 Παράτεινον τὸ ἔλεος σοῦ τοῖς γινώσκουσίν σε. Ἀμήν.

HYMNUS ANGELICUS.

Gloria in excelsis Deo,
 Et in terra pax,
 Hominibus bonæ voluntatis !
 Laudamus Te, benedicimus Te,
 Adoramus Te, glorificamus Te,
 Gratias agimus Tibi propter magnam gloriam tuam ;
 Domine Deus, rex cœlestis,
 Deus Pater omnipotens,
 Domine Fili unigenite, Jesu Christe ;

Domine Deus, agnus Dei, filius Patris,
 Qui tollis peccata mundi, miserere nobis :
 Qui tollis peccata mundi, suscipe deprecationem nostram :
 Qui sedes ad dextram Patris, miserere nobis :
 Quoniam tu solus sanctus, tu solus Dominus,
 (Tu solus altissimus), Jesu Christe,
 (Cum Sancto Spiritu), in gloria Dei Patris. Amen.

THE COMMUNION SERVICE.

Glory be to God on high, and in earth peace, goodwill towards men. We praise Thee, we bless Thee, we worship Thee, we glorify Thee, we give thanks to Thee for Thy great glory, O Lord God, heavenly King, God the Father Almighty.

O Lord, the only-begotten Son, Jesu Christ; O Lord God, Lamb of God, Son of the Father, that takest away the sins of the world, have mercy upon us. Thou that takest away the sins of the world, have mercy upon us. Thou that takest away the sins of the world, receive our prayer. Thou that sittest at the right hand of God the Father, have mercy upon us.

For Thou only art holy; Thou only art the Lord; Thou only, O Christ, with the Holy Ghost, art most high, in the glory of God the Father. Amen.

The verses added in the Greek after the first Amen, are from the Psalms, for the Morning as far as the second Amen; and for the Evening, to the third Amen.

MORNING PSALM.—Every day will I bless Thee, and I will praise Thy name for ever and ever. (Ps. cxlv. 2.) Vouchsafe, O Lord, to keep us this day without sin. Blessed art Thou, O Lord God of our fathers, and Thy name be praised and glorified for ever and ever. (Tobit viii. 5.) Amen.

EVENING PSALM.—Blessed art Thou, O Lord, teach me Thy statutes. (Ps. cxix. 12.) Lord, Thou hast been our dwelling-place in all generations. (Ps. xc. 1.) I said, Lord, be merciful unto me: heal my soul, for I have sinned against Thee. (Ps. xli. 4.) Lord, I flee to Thee to hide me: teach me to do Thy will, for Thou art my God. For with Thee is the fountain of life. (Ps. cxliii. 9, 10.) In Thy light shall we see light: Oh, continue Thy loving-kindness to them that know Thee. (Ps. xxxvi. 9, 10.) Amen.

TATE AND BRADY. C. M.

To God be glory, peace on earth,
 To all mankind good-will ;
 We bless, we praise, we worship Thee,
 And glorify Thee still.
 And thanks for Thy great glory give,
 That fills our souls with light ;
 O Lord God! heavenly King! the God
 And Father of all might.
 And thou, begotten Son of God,
 Before all time begun,
 O Jesu Christ ! God, Lamb of God,
 The Father's only Son !
 Have mercy, Thou that tak'st the sins
 Of all the world away,
 Have mercy, Saviour of mankind,
 And hear us when we pray !
 O Thou, who sitt'st at God's right-hand,
 Upon the Father's throne,
 Have mercy on us, Thou, O Christ,
 Who art the Holy One !
 Thou, Lord, who with the Holy Ghost,
 Whom heaven and earth adore,
 In glory of the Father art,
 Most high for evermore.

Another version is offered in the metre called sevens,
 which preserves the accent of the Angel song ; and, while
 omitting nothing but the repetition, "Have mercy on us,"
 it includes the Morning and Evening Psalms.

Glory be to God on high,
 Peace on earth, to men good-will !
 Thee we praise and magnify,
 Thee we bless and worship still ;
 For Thy glory great, O God,
 King of all the heavenly host,
 Lord Almighty, Thee we laud,
 Father, Son, and Holy Ghost.

Lamb of God, the Holy One,
 Taking all our sins away ;
 Thou, the Father's only Son,
 Hear us while to Thee we pray !
 Jesus Christ, Lord God alone,
 Grant us mercy, we implore,
 Sitting on the Father's throne,
 For His glory evermore. (Amen.)

Day by day we magnify,
 And for ever bless Thy name.
 Deign this day, O Lord most high,
 Us to keep from sin and shame.
 God of our forefathers, Thou,
 Art most blessed, O our Lord,
 Let thy name be praised now,
 And for ever be adored. (Amen.)

Blessed Lord, teach us Thy word,
 Thou who art our dwelling-place :
 This day's sin forgive, O Lord ;
 Heal our spirit by Thy grace :
 Hide us, for to Thee we flee,
 Fount of life in mercy flow ;
 In Thy light, light shall we see,
 And Thy love for ever know. (Amen.)

Ἕμνος τοῦ λυχνικοῦ.

(From the "Apostolic Constitutions," Book ii.)

Φῶς ἰλορὸν ἀγίας δόξης,
 Ἀθανάτου Πατρὸς, Ἰησοῦ Χριστὲ,
 Ἐλθόντες ἐπὶ τοῦ ἡλίου δύσιν,
 Ἰδόντες Φῶς ἐσπερινόν.
 Ἕμνοῦμεν πατέρα καὶ υἱόν,
 Καὶ ἅγιον πνεῦμα Θεοῦ·
 Ἄξιός ἐστιν ἕν ᾧ ἅσι καίροις
 Ἕμνεῖσθαι φωναῖς ὁσαύτως,
 Υἱὲ Θεοῦ ζωὴν ὁ διδάς,
 Διὸ ὁ κόσμὸς σε δόξαζέει.

HYMN OF THE EVENING LAMP.

TRANSLATION BY BUNSEN.

Serene Light of holy glory,
 Of the Father everlasting, Jesus Christ,
 Having come to the setting of the sun,
 And seeing the evening light,
 We praise the Father, and the Son,
 And the Holy Spirit of God :
 It behoveth to praise Thee
 At all times with holy songs,
 Son of God, who hast given life,
 Therefore the world glorifieth Thee.

TRANSLATION BY DR. J. PYE SMITH.

Jesus Christ! Joyful Light of the holy glory of the eternal Father !
 Having come to the setting of the sun, beholding the evening light, we
 praise the Father and the Son, and the Holy Spirit of God. Thou art
 worthy to be praised with sacred voices at all seasons, O Son of God, who
 givest life, wherefore the universe glorifieth Thee.

The other Evening Hymn, from the Apostolic Constitu-
 tions, looks like an abbreviation or variation of the Morning
 Hymn, as the four middle lines are taken from it.

Αἰνεῖτε παῖδες Κύριου,
 Αἰνεῖτε τὸ ὄνομα Κυρίου
 Αἰνοῦμεν σε, ὑμνοῦμεν σε, εὐλογοῦμεν σε,
 Διὰ τὴν μεγάλην σοῦ δόξαν
 Κύριε βασιλεῦ, ὁ πατὴρ τοῦ Χριστοῦ,
 Τοῦ ἀμώμου ἀμνοῦ ὃς αἶρει τὴν ἀμωρτιάν τοῦ κόσμου,
 Σοὶ πρέπει αἶνος,
 Σοὶ πρέπει ὕμνος,
 Σοὶ δόξα πρέπει τῷ Θεῷ καὶ πατρί
 Διὰ τοῦ υἱοῦ ἐν πνεύματι τῷ παναγίῳ
 Εἰς τοὺς αἰῶνας τῶν αἰώνων. Ἀμήν.

BUNSEN'S TRANSLATION.

Praise, O ye servants of the Lord,
 Praise ye the name of the Lord ;
 We praise Thee, we sing to Thee, we bless Thee,
 On account of Thy great glory.

O Lord the King, Father of Christ,
 Of the spotless Lamb, who taketh away the sin of the world,
 It behoveth to praise Thee;
 It behoveth to glorify Thee, God and Father,
 Through the Son in the Holy Spirit for ever and ever. Amen.

THE EVENING HYMN.

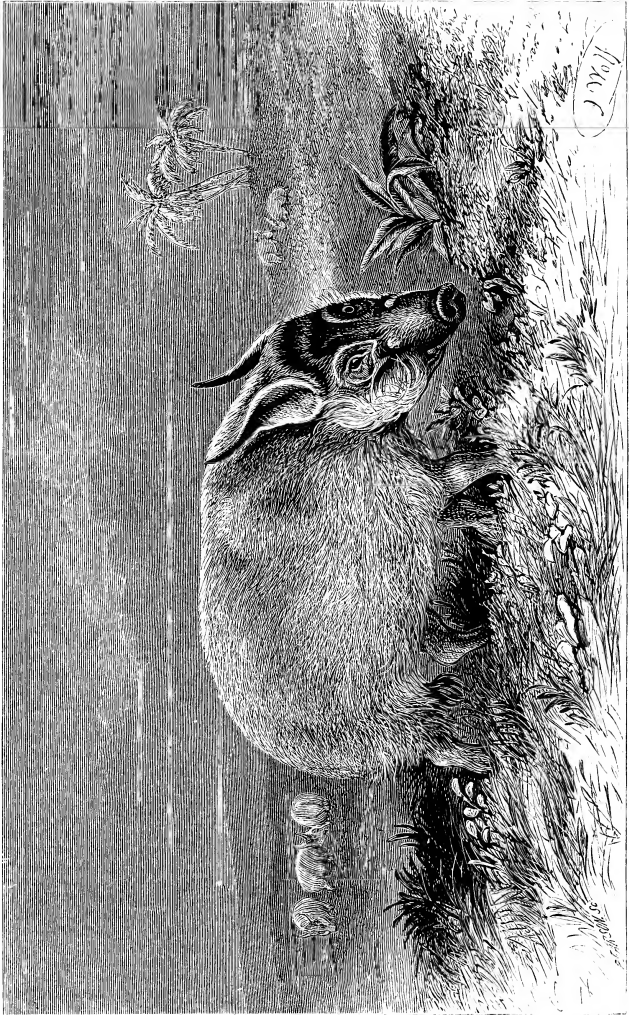
(The two are united in this version.)

Jesus Christ, the Light serene,
 Of the Father's glory bright,
 Now the setting sun is seen,
 And the pleasant evening light;
 Thee, we with the Father praise,
 And the Spirit, in our songs,
 All the praise the world can raise,
 Son of God, to Thee belongs.

Praise the Lord, O praise His name;
 Thee we bless, to Thee we sing,
 And Thy glory great proclaim,
 For Thou art our God and King;
 Father of the Lamb of God,
 Who the world's sin takes away,
 May Thy praise be spread abroad,
 Through an everlasting day.

For further information the reader may consult Bunsen's "Hippolytus," Routh's "Reliquiæ Sacræ," vol. ii. p. 515, and Daniel's "Thesaurus Hymnologicus," vol. iii. p. 267.

H. M. G.



The River Pig.

THE RIVER PIG ; OR, PAINTED PIG OF THE CAMAROON.*

THE other day we revisited the Zoological Gardens, and found that two old friends had got,—the one, a companion, the other, a neighbour. The latter was the bulky Hippopotamus, now most bearish, and more and more unmistakably showing the minute accuracy of those master lines in the Book of Job, in which Behemoth's portrait, pose, and character are depicted. The former was the subject of this article ; evidently, as far as colour goes, “ the chieftain of the *porcine* race.”

The poet tells us, however, “ *Nimium ne crede colori ;*” and observation, as well as the Scripture, shows us daily that “ fair havens ” in summer, are but foul places to “ winter in ;” that fair speeches, and a flattering tongue, and the kisses of an enemy, “ are deceitful ;” and that beneath a fine spotted or barred coat, the jaguar and the tiger, the cobra and the hornet, conceal both the power and the propensity for mischief. So with our old friend Potamochoerus. The pretty creature—beauty is relative,—the Camaroon pig is the prettiest, the gaudiest of the race—the pretty creature, we repeat, is of a fine bay red, made to look more bright from the circumstance of the face, ears, and front of the legs being black, while the red is relieved, and the black is defined, by the pencilled lines of white which edge the ears, streak over and under the eye, and ornament the long whiskers, another long white line traversing the middle of the back ;—a very attractive combination of colour

* *Potamochoerus penicellatus*. Ποταμός, river ; χοίρειος, a pig ; penicellatus, pencilled.

—the painting of “Him who made the world”—and one which must make the *Potamochoerus penicellatus* most conspicuous, among the bright green shrubs and dark marshes of the rivers of equinoctial Africa, on whose banks the race has been planted. The present largest specimen was taken, when a “piggie,” by a trading captain, as it was swimming across the Camaroon River. He brought it to Liverpool; Dr. Gray of the British Museum gave an account of it in the “Illustrated Proceedings of the Zoological Society of London for 1852,”—an excellent work,—where its figure, drawn and coloured by the hand of Wolf, shows the condition of the African Sow four years ago. It was then a round, comfortable, kind-looking creature, which one might almost have fondled as a pet. The Pig now looks rather a dangerous beast, and its beauty is not increased by its face having grown longer, and by the bump and hollow on each cheek being larger and deeper; nor is its mouth so attractive or innocent, now that its tusks—those ivory daggers and knives of the family of Swine—have grown longer. The creature, partly it may be from familiarity, jumps up against the iron palisade which separates the visitor from its walk, but a poor pannage as a substitute for its African home. We would advise him to read the notice: “Visitors are requested not to teaze the animals;”—“not to touch” would be a good reprint—for few, we fancy, would try to teaze.

One, however, especially a lady, likes to know and to feel *texture*; and sadly used the fine, mild Edward Cross of Exeter Change and the Surrey Zoological Gardens, once the Nestor as well as the King among Keepers of Wild Beasts—a gentle, gentlemanly, white-haired, venerable man,—sadly, we say, used Mr. Cross to lament that there *were* parasols, and that he could not keep them *out* of his Garden: Mr. C. told the writer that he lost many a beast and bird from the pokes of that insinuating weapon. We dissuade

any lady from touching or going near a zebra's mouth, or the horns of an ibex or an algazel, or the pointed bill of a heron or stork, or from putting her hand near this fine Painted Pig.

Up jumps *Potamochoerus*—eye rather vindictive, however,—and mark, as that big specimen is foreshortened before you, the profile of the little companion pig of the same species, standing within a few feet, but safe from the poke of any umbrella or parasol; look how innocent and inviting, how quiet, and sleek, and polished, and painted, and mild, it looks, all but that little suspicious eye, with its wink oblique, and its malicious twinkle.

Of the habits of this pig we can find no written record, though in the Journals of the Scottish or Wesleyan Missionaries, there may be some notices of it. We do not know whence the Society procured the second specimen, but it shows that Africa's wild animals, like its chain of internal Caspian seas, and its mountain-ranges and rivers, are becoming gradually known. Old Bosman, who was chief factor for the Dutch on the Gold Coast 150 years ago, refers to the swine near Fort St. George d'Elmina, being not nearly so wild as those of Europe, and adds, "I have several times eaten of them here, and found them very delicious and very tender meat, the fat being extraordinary fine."* He evidently refers to some other species.

Travellers in South Africa have made us familiar with the habits, and specimens in the Zoological Gardens in a pannage close to that of the "Painted Pig" show us the form and ugliness, of the Bush pig and Flat pig (*Choiropotamus Africanus*) of that southern land, with their long heads, long legs, up-turned tails, and horrid tusks. They have a strange habit of kneeling on their fore-legs. In South Africa they

* A new and accurate description of the Coast of Guinea, written originally in Dutch. London, 1705, p. 247.

abound ; and the natives, our excellent friend, the Rev. Henry Methuen, tells us, often bring their jaws for barter. They are of a dingy, dirty grey ; the boar is two feet and a half high, and his tusks sometimes measure “ eleven inches and a half each from the jaw-bone,” are five inches and a half in circumference at the base, and are thirteen inches apart at their extremities.

No animal is more formidably armed ; and his rapidity and lightness of movement make him a very marked object to the African Nimrod, who, midst “ clumps of bush”—be they Proteaceæ, Heaths, or Diosmeæ—not unfrequently comes on a herd of wild pigs “ headed by a noble boar,” with tail erect. We could enter largely on the history of this active species, and quote many a stirring anecdote of travellers’ rencontres with this fearless animal. The lion skulks away from him, but the rhinoceros—at least one species—the buffalo, with his formidable front of horn and bone, and the bush pig, with his dreaded tusks, show but little fear ; and it is well for the huntsman that he has a sure eye, a steady hand, and a double-barrelled gun, and not a few Caffir followers, to help him, should his eye be dim, his hand waver, or his gun “ flash in the pan.” Dogs avail but little ; a deadly gash lays open their ribs, and a side-thrust of a wild boar will cut into the most muscular leg and for ever destroy its tendons. We have done with Pigs, and would only recommend a visit—a frequent visit—to that paradise of animals, the Zoological Gardens, where, a fortnight ago, we saw wild boars from Hesse Darmstadt ; wild boars from Egypt ; bush pigs from Africa ; peccaries from South America ; and two Painted Pigs from West Africa ; *all* “ de grege porci,” and in excellent health :—to say nothing of two hippopotamuses, four “ seraphic ” giraffes ; antelopes (we did not number them) ; brush turkeys from Australia ; an apteryx from New Zealand ; the curious white sheathbills from the South Seas ;

the refulgent metallic green and purple-tinted Monaul, or Impeyan pheasant, strutting with outspread, light-coloured tail, just as he courts his plain hen-mate on the Indian mountains ; a family of the funny pelicans—cleanliness, ugliness, and contentment, in one happy combination ; a band of flamingoes ; eagles and vultures ; the harpy—that Picton of the birds—looking defiance as he stands with upraised crest, flashing eye and clenched talons, over his food ; the wily otter ; the amiable seal, which carries us to the seas and rocks of much-loved Shetland, with their long, winding voes, their bird-frequented cliffs, and outlying skerries ; the Indian thrush, which reminds one of a "mavis" at home ; the parrot-house, with its fine contrasts of colour and its discordant noises ; Penny's Esquimaux dog,—poor fellow—a prisoner, unlike to what he was when, with our dear friends Dr. Sutherland and Capt. Stewart, this very dog breasted the blast before a sledge in the Wellington Channel.* Look at that wondrous sloth, organised for a life in a Brazilian forest—those two restless Polar bears ; and though last, not least, those wonders of the great deep, "the sea-anemones," the exquisite red and white "feathery" tentacles of the long cylindrical twisted *serpulæ*, and marvellously transparent streaked shrimps, all leg, and feeler, and eye, and "nose"—in the salt-water tanks in the Vivarium.

* See Dr. Sutherland's interesting account in his "Journal of a Voyage in Baffin Bay and Barrow's Straits in the years 1850, 1851 ;" a truly excellent work on the Arctic Regions, by one who is now Surveyor of Natal.

A. W.

March 10.

OURSELVES.

NUTRITION.

THE recurring sensations of Hunger and Thirst are “the creaking” of our living machinery. They indicate the expenditure incurred by the functional acts of Life; and tell of a renewed necessity for food and drink.

The Lamp of Life, when once lighted, must be duly replenished, or it soon goes out. A man can hardly live three weeks without food. If, however, he is supplied with drink, although it contains almost no nourishment, he may linger on for seven, or even eight weeks. Death then ensues, partly, from inanition—from exhaustion of material—and partly, from prostration of the powers of life—from incapability of carrying on the vital functions.

On the other hand, Food and Drink can kill as well as nourish! A lamp may be overfilled with oil. We can heap too much fuel on the fire. Over-eating does more harm than abstinence. The Human Organisation, like other machinery, must be *properly* supplied, not clogged with aliment, or else it will not work well, or stop. He who would live a long, and a happy life, must live temperately. “We should eat to live, not live to eat.”

The function of *Nutrition*—the resolution of Food into aliment, and aliment into Blood—is effected by two processes; *Digestion* and *Assimilation*. But neither of these is a specific act. Both of them consist of a series of changes; each of which is the work of a separate apparatus, requiring a different agency.

It is an essential requisite of every kind of Food, that it shall have been previously organised. As far as we know, no new organic being is ever produced from inorganic mat-

ter: nor can any individual be sustained by unorganised substances. Not that these, as Salt, Lime, the Gases, &c. are to be considered as useless; on the contrary, they subserve, at the least, to promote the necessary changes in organic structures.

The preparation of food by *Cooking* is quite peculiar to the Human species. Hence, man has been characterised as “a cooking animal;” and the designation, as far as it goes, is not an inappropriate one.

The legitimate uses of cooking are to break down the fibre and solidity of crude alimentary substances, and to develop those flavours which give a zest to food: its illegitimate objects are to pamper vitiated appetites, and to minister unwholesome gratification to our inferior nature.

During mastication, while the food is being bruised and comminuted by the *Teeth*, a copious supply of fluid is poured out by the *Salivary Glands*, which is, or ought to be, mixed with the morsel before it is swallowed.

The form, structure, and position of the Teeth, as well as the proportionate size and arrangement of the muscles connected with the mouth and jaws, in all classes of animals, bear intimate relation to the food on which they live. Sharp, conical teeth, and teeth surmounted with pointed eminences, suitable for tearing, bruising, and dividing fleshy substances, fixed in jaws, the movements of which are almost only vertical, obviously belong to carnivorous feeders. Again—chisel-shaped front teeth, or incisors, as they are termed, fit for tearing off blades of grass, and other forms of herbage, associated with flattened grinders, and a large lateral movement of the jaw, are best adapted for grazers and herbivorous animals. Other varieties, in other tribes, as clearly intended for special uses, afford distinctions equally real, and as plainly indicate the appropriate food.

Hence, if we had no other grounds for the conclusion,

which, as will be seen hereafter, we have, we might reasonably infer, from the form of his teeth, and the general structure of his mouth, that man is to be sustained by a fixed diet.

In the adult mouth there are thirty-two teeth—sixteen in each jaw. These are termed permanent, to distinguish them from the temporary or deciduous teeth of children, which are only twenty in number.

The shape of the permanent teeth, almost naturally, arranges them into three kinds—*Incisors* or cutting teeth; of which there are four in the front of each jaw: *Canine* or tearing teeth; one on each side, next to the incisors: and twenty *Molar*, or grinders; these are again subdivided into bicuspid and true molars.

Each tooth consists of two substances: viz. the *Dentine* or true tooth substance, which constitutes the basis of the structure, and forms the largest part of the tooth; and is like ivory, very dense and compact: and the *Enamel*, a white, and exceedingly hard material, formed of prismatic crystals, arranged side by side, and set up perpendicularly, by which the whole of the crown of the tooth is encrusted.

A thin layer of cement, differing from the Enamel, covers those parts of the teeth, which are not encrusted by it.

The hollow interior of each tooth is filled with a pulpy substance, which is well supplied with blood-vessels and nerves; these reach it through an aperture at the apex, and a canal in the root of the fang, by which it is fixed in its socket, in the jaw.

The necessity for “shedding the teeth” arises from two circumstances; the enlargement of the jaw as growth proceeds, and the nature of the Enamel. For, the Enamel, not being organised, does not allow of any alteration in the size of the teeth; as soon as they become covered with it they

cease to enlarge, and to correspond with the increased dimensions of the jaw, which they suited very well while it was yet small. It becomes necessary, therefore, that they should give place to others, formed in a larger mould. Early provision is made for this change. Four or five months before birth, the rudiments of the permanent teeth, are arranged in capsules below the temporary ones: as the jaw increases in size, they increase in size too; and, gradually, by outward and upward pressure, they occasion the absorption of the fangs of the temporary teeth, and so, their ultimate expulsion. As the hinder part of the jaw-bones is comparatively larger than the front and sides, for in growing the extension is principally backwards, the molar teeth are formed and retained, of their full size, and are consequently permanent ones. The last four are commonly smaller than the others; they usually make their appearance about the age of twenty-one: and, hence, are called the wise or wisdom teeth!

The *Gums* consist of two layers of a firm, fibrous, and almost spongy tissue, covered by the mucous membrane of the mouth. They form a compact cushion, which lines the outer walls of the sockets in which the teeth are fixed; it occupies the intervals between the teeth; the necks of which are also closely invested by it. The mucous membrane dips into the sockets, and gives off the pulpy structure by which the interior hollow of the teeth is filled. The Gums are well supplied with blood-vessels, but only scantily with nerves.

The *Salivary Glands*, three on each side of the face, behind and below the lower jaw, furnish the fluid by which the mouth is, ordinarily, kept moist, and which during mastication is greatly increased. They are irregular in shape, and their size varies a good deal in different persons. They consist of granules, which are successively united into

lobules, and lobes, held together and invested by the common cellular membrane. They are well supplied with blood-vessels, and derive their nerves immediately from the Brain.

The *Parotid* (Greek: before the Ear) is the largest—it lies partly in front of, and partly under the external ear. Its duct opens into the mouth, just opposite the second molar tooth of the upper jaw, on the inner side of the cheek.

The *Submaxillary* is placed at the inner side of the angle of the lower jaw—its duct arises, like the duct of the parotid, by slender radicles, from the lobules of the gland, and terminates in a little tubercle, at the side of the frænum, or bridle fold, under the tongue, where it can easily be seen.

The *Sublingual* gland, the smallest of the three, is imbedded in the cellular substance under the forepart of the tongue; its ducts end almost immediately, and sometimes in common with the Submaxillary duct.

The quantity of fluid which these glands furnish varies according to circumstances. It is commonly supposed that, in an adult, it amounts to about from ten to fourteen ounces daily. Unmixed with the secretions from the glands in and about the mouth and fauces, it consists of a large proportion of water—amounting to 99 per cent. Mucus, albumen, pure soda, muriate of soda and potass, phosphate of lime, and sulpho-cyanide of potass, yield only 1 per cent.

As might be expected, the quantity poured out during mastication, depends greatly upon the dryness of the food, and upon the necessity which exists for its minute comminution—thus apples require only 4 per cent, nuts 8 per cent, biscuits about 28, beef 43 to 45, and for different sorts of bread from 30 to 127 per cent.

The recollection, and the sight, perhaps the anticipation of pleasant food, as well as the acts of mastication, singing, speaking, tobacco-smoking, and titillation of the ends of

the ducts, and of the soft palate, all tend to increase the quantity.

It has been found also, that on introducing food into the stomach, through the intervention of a tube passed into the œsophagus, without coming into contact, at all, with the interior surface of the mouth; and more conclusively still, through a fistulous opening into the stomach, more saliva was at once secreted; and that if salt was substituted for food, the quantity was still larger.

The structure of the *Tongue*, its duties as an organ of taste, and the parts it takes in the acts of mastication and swallowing, have been already noticed.

The vaulted roof of the mouth, termed the *bony Palate*, is formed of several portions of separate bones, nicely and neatly united. It is lined by a thick layer of mucous membrane, the anterior part of which is traversed by several rugosities; the whole of it is dotted with the openings of many follicles, which yield the mucus by which its surface is lubricated. At the back part of the mouth the membrane folds downwards, and forms the *Veil of the palate* (the *Velum palati*), from the middle of which is suspended a little grape-like elongation, called the *uvula*. Between the folds or pillars of the veil, the *Tonsils* are lodged. They are ovoid; about as large as small olives; they pour out rather a considerable amount of lubricating mucus.

Tracing the course of the food, we come to the *Pharynx*; which is a large, muscular, and membranous sac, somewhat funnel-shaped. It is limited, above, by the under surface of the cranium; anteriorly, by the isthmus of the fauces, consisting of the veil of the palate and the back part of the tongue, and by the larynx; behind, it rests against the vertebræ; and below, it is continuous with and ends in the *Œsophagus*.

LIFE, IN ITS HIGHER FORMS.

No. II.

AMPHIBIA.

“To any person,” observes the eloquent historian of British Reptiles, “capable of appreciating the interest attached to the study of physiological phenomena, the contemplation of an animal which at one period of its life is endowed exclusively with the organs of aquatic respiration, resembling the gills of fishes, with means of locomotion adapted only to a constant residence in the water, and with a digestive apparatus fitted exclusively for the assimilation of vegetable food, assuming by degrees the function of atmospheric respiration, acquiring limbs which are formed for leaping on land with great strength and agility, and manifesting the most voracious carnivorous appetite, will not only excite feelings of the deepest admiration, but necessarily lead to the investigation of the laws by which such extraordinary changes are governed, and of the relations which they bear to the theory of continuous affinity, and to that of progressive development through the whole of the animal kingdom.”*

Such phenomena are exhibited by the Toads, Frogs, and Newts, the familiar representatives of that limited Class of animals whose scientific appellation we have inscribed at the head of this paper. They thus afford a beautiful link in that tissue of “*chain-mail*” which constitutes the Plan of Nature; for they evidently hold an intermediate position between the FISHES, whose respiration is exclusively aquatic, and the true REPTILES, in which this vital function is exclusively aërial.

* Bell’s “Brit. Rept.” p. 72.

Let us look a little more closely at this curious point, the metamorphosis which the AMPHIBIA undergo, and the accompanying change in the character of their breathing organs. At this season of the year, in almost every ditch and pool in the country, we see large masses of clear jelly, with black dots distributed at even distances throughout, or long strings of the same substance, in which the black dots are arranged in a double row. The former is the spawn of the Frog, the latter that of the Toad ; and each dot is the maturing embryo of a single egg, which latter is a clear globe of about one-fifth of an inch in diameter. When the spawn is laid, the embryo is an opaque globule, darker at one side than at the other. In a few days, however, this begins to take the form of an animal,—the head, the body, and the tail being distinct, as the little creature lies on its side within the egg, coiled up in a semicircle. Soon a kind of wart buds from each side of the neck—the future gills ; and currents of water are seen to stream to and from these important, but as yet minute, organs.

As time passes, the gills divide into branches, the nostrils and the eyes appear, and traces of the mouth may be discerned. Meanwhile the power of voluntary movement, at first confined to the head and tail, increases ; and the little prisoner, as if impatient of confinement, tries to straighten itself by spasmodic efforts, and at length succeeds in rupturing the skin of the egg and becomes free.

It is now a Tadpole,—a fish-like creature, without limbs, with an enormous head, and a body thinned off to a long tail, which is furnished with a broad finny expansion above and below. The gills now attain their greatest size, and consist on each side of a pair of much-branched tufts, which under the microscope present a most interesting spectacle. The blood, forced from the heart in regular pulsations, is seen to diverge into each of the main gill-

stems, sending off lateral streams to every tiny branchlet: the red globules are seen to chase each other along the tortuous vessels, to pass to the extremity of every ramification, and then, turning, follow a backward course, until they reach the heart, the fountain from whence they issued.

But now these organs begin to disappear; they gradually diminish, until at length they can no longer be discerned externally, though their function is carried on in a cavity of the body on each side. The little animal increases rapidly in size, but does not change this its fish-like form for a considerable period, though minor modifications may be traced. Thus the mouth becomes developed, the eyes are perfectly formed, and the tail-fin grows greatly in perpendicular breadth, and is a powerful organ of locomotion. The little Tadpole begins greedily to devour vegetable matter, and manifests the effect of this diet in the change of its own hue from a dull black to a soft olive-green, with golden specks on the under parts.

At length the period approaches when the Tadpole must leave its aquatic life, and become terrestrial;—at least it must cease to respire water, and must derive its vitality from the air. The first step to such a change, is the development of limbs. First appear the hind-legs, in the form of a pair of minute budding warts, which lengthen, become bent, and shoot forth tiny toes at the extremity. The fore-legs, always a little later than the hind, accompany the latter in their gradual progress. As the new organs of motion are acquired, the old one—the vibrating tail with its fin,—is lost. It is not thrown off, but its substance is gradually absorbed into the body. As this process takes place during the growth of the legs, when it is completed, the Tadpole has become a little Frog. The minute orifices which admitted the water into the gill-chamber, have at the

same time become closed, and breathing is henceforth performed exclusively by means of *lungs*, which are capacious sacs, subdivided internally into large cells.

Such, then, is the metamorphosis which obtains in the most elevated forms of this Class, as our common Frog and Toad; and it may be witnessed with slight precautions by any one who will take the trouble to collect a mass of spawn from the nearest ditch, and transfer it to a fresh-water aquarium. In the Newts, which are no less common, the metamorphosis is less complete, and we perceive in their ultimate condition a closer alliance with FISHES; since their limbs are small and feeble, their broad finny tail is retained through life, and is the principal organ of locomotion, for, in general, they continue more exclusively aquatic in their mode of life than the adult Frog or Toad.

The eggs of the Newts are not deposited in a mass, but singly, and that under interesting conditions. Professor Bell thus describes the process in the case of our largest and finest species, the Common Warty-newt (*Triton cristatus*), the males of which are conspicuous enough in the vessels of the dealers in aquatic animals, in Covent Garden Market and elsewhere, by their roughened blackish upper parts, their high notched back-fin, and their rich orange underparts, spotted with black. The female is of less brilliant hues, and is destitute of the tall fin.

“The period when the deposit of the eggs commences, depends upon the season; but the time when the greater number are produced, is during the months of May and June; and it is worthy of notice, that the different species of Newt are found depositing their eggs during a much longer period of the summer than the tail-less Amphibia, such as the Frog and Toad. At the time I have mentioned, if the leaves of the various species of aquatic plants be observed, many of them will be found folded together; and

within the fold a single egg of the Newt will be discovered. It is, however, necessary for accurate observation from the commencement, that the female Newt be taken and placed in a vessel of water with the plants in question, that she may deposit the egg under the eye of the observer. The best plant for the purpose is the *Polygonum persicaria*, which is ordinarily chosen by the animal in its natural habitat. A large glass globe is a good vessel for the purpose of observation; but if it be wished to employ a larger one, I may be allowed to recommend the largest sized foot-bath made of white ware. This vessel I have often used for keeping many aquatic animals; and if a layer of Roman cement be placed at the bottom, and a few pebbles, or a stone of sufficient size be fixed by the cement at one end, the objection to the slipperiness of the vessel will be obviated, and the animal will also have the opportunity of coming above the surface at pleasure.

“The manner in which the eggs are deposited, is very interesting and curious. The female, selecting some leaf of an aquatic plant, sits, as it were, upon its edge, and folding it by means of her two hinder feet, deposits a single egg in the duplicature of the folded part of the leaf, which is thereby glued most securely together, and the egg is thus effectually protected from injury. The manner in which this is effected is highly interesting, and may be readily observed by any one. As soon as the female has in this way deposited a single egg, she quits the leaf; and after the lapse of a short time seeks another, there to place another egg.”*

Passing from these familiar creatures, we find in foreign countries a few forms, which, though repulsive in aspect and manners to the common observer, are of high interest to the physiologist, because they manifest a still closer affinity with

* Op. cit. pp. 123, 122.

the Class we last considered. The Hellbender (*Menobranthus*) of the United States, the Axolotl (*Axolotus*) of Mexico, and the *Proteus* of Austria, are large Newts, which never lose their gills through life, but permanently perform an aquatic respiration simultaneously with an aërial one. In all these animals, the limbs are reduced to a rudimentary condition; and in the *Siren* of Carolina, which also has a permanent double respiration, the hind limbs are totally wanting. Finally, the *Amphiuma* of the same region, which has an orifice in the neck, but has no external gills at any period of life, has the appearance of an Eel, with four minute rudimentary feet; and the bones of the spine present on each surface that concavity which belongs to the *vertebræ* of FISHES.

Of these creatures one of the most interesting is the *Proteus* (*P. anguinus*), which inhabits the waters of great subterranean cavities in the limestone formation of Southern Europe. One of the most romantic and splendid caverns in the world is the grotto of the Magdalene, near Adelsburg, in the duchy of Carniola. The whole of that region consists of bold, craggy rocks and mountains of limestone formation, perforated with spacious branching caverns, in whose awful recesses sleep the sluggish waters of vast subterranean lakes, whence many rivers take their origin. In these dreary reservoirs, over which a gleam of light has never played, save when the torch of the inquisitive traveller is flashed back from the unruffled surface, are found many *Protei*, swimming through the waters or burrowing in the mud which is precipitated by them. Specimens have been thrown up by water from a subterraneous cavity at Sittich, about thirty miles distant from the grotto of the Magdalene; and the species is said to exist in the caves of Sicily.

Sir Humphry Davy, in his "Consolations in Travel," has graphically described the appearance, habits, and local-

ities, of this singular animal. We have room but for the following extract, which bears on the point already insisted on in the preceding notes,—the intermediate position of the creature between FISHES and REPTILES :—

“At first view you might suppose this animal to be a lizard, but it has the motions of a fish. Its head, and the lower part of its body, and its tail, bear a strong resemblance to those of the Eel ; but it has no fins, and its curious branchial organs are not like the gills of fishes ; they form a singular vascular structure, as you see, almost like a crest round the throat, which may be removed without occasioning the death of the animal, which is likewise furnished with lungs. With this double apparatus for supplying air to the blood, it can live either below or above the surface of the water. Its fore-feet resemble hands, but they have only three claws or fingers, and are too feeble to be of use in grasping or supporting the weight of the animal ; the hinder feet have only two claws or fingers, and in the larger specimens are found so imperfect as to be almost obliterated. It has small points in the place of eyes, as if to preserve the analogy of nature. It is of a fleshy whiteness and transparency in its natural state, but when exposed to light its skin gradually becomes darker, and at last gains an olive tint. Its nasal organs appear large, and it is abundantly furnished with teeth, from which it may be concluded that it is an animal of prey ; yet in its confined state it has never been known to eat, and it has been kept alive for many years by occasionally changing the water in which it was placed.”

Specimens, which have been kept for some time in England, have been observed to shroud themselves in the darkest part of the vessel in which they were placed, when the covering was taken off in order to inspect them ; and to betray a sense of uneasiness by their actions when exposed

to the light of open day, creeping round the sides of the vessel, or under the shelter of any substance which threw a partial shadow on the water. Though these animals lived many months, and were healthy and vigorous, they were not supplied with any food, nor is it certainly known on what they subsist, though there is every reason to believe them carnivorous.*

Confined in a state of nature to the darkness of perpetual midnight in the recesses of its gloomy caverns, the faculty of sight would be thrown away upon the *Proteus*. Accordingly it is found that though it possesses rudiments of eyes, they are reduced to specks of excessive minuteness, and are, besides, covered by the common skin of the head. And this leads us to mention the curious fact that there exists a subterranean *fauna* existing chiefly in mines and caves, every individual of which is totally blind by nature. Numerous species have been lately brought under the notice of naturalists, especially from the great caverns of North America, none of which can be identified with any known supra-terrestrial species, and every one of which is sightless.

We have hitherto spoken only of that measure of respiration which is effected either by means of gills, or of lungs, or of both together. But experiments have shown that the adult Amphibian needs yet a further supply of oxygen, which it obtains through the whole surface of the skin. A Frog has been kept alive for forty days after having been subjected to the total privation of its lungs.

In order, however, that the skin should be fit for the performance of this function, it is absolutely essential that it be maintained in a moist state: dryness of the skin is speedily fatal. A beautiful provision is made for the supply of the requisite superficial moisture, by a secretion from the skin itself. "The extent of the skin is, however," observes

* "Pict. Museum of Anim. Nature," ii. 135.

Professor Bell, "so great that the whole internal moisture of the animal would speedily be exhausted, unless a reservoir were provided for an extraordinary demand; and I now proceed to show what this reservoir is, and by what means it is replenished. Every one knows that when a Frog is hastily seized, or even quickly pursued, it voids a considerable quantity of water, which is generally, but erroneously, supposed to be the urine. This water is limpid and pure, containing no traces of the usual component elements of the urinary secretion. It is contained in a sac, which has also been mistakenly believed to be the urinary bladder. This is the reservoir to which I have alluded. When, therefore, the Frog is happily placed in a damp atmosphere, or in water, the skin absorbs a quantity of water, which there is every reason to believe is secreted into the bladder just mentioned, where it is kept in store until the dryness of the skin requires a supply for the purpose of respiration, when it is again taken up and restored to the surface by which it had been first absorbed."*

Thus in ten thousand instances the Christian philosopher is reminded of the loving-kindness of the Lord, which is over all His works. Every creature that He has made is sustained in life, and health, and comfort, and abundance, for its appointed time, by His ever-watchful and beneficent care. And nothing is neglected, nothing forgotten;—the *Proteus* in its dark cavern, and the Frog in its stagnant pool, are as lovingly remembered as the Eagle in the clouds or the Lion in his lair. "He openeth his hand, and satisfieth the desire of EVERY LIVING THING."

"If, ceaseless, thus the fowls of heaven He feeds,
 If o'er the fields such lucid robes He spreads,
 Will He not care for *you*? ye faithless! say;
 Is He unwise? or are ye less than they?"

* "Brit. Rept." p. 179.

HINTS ON DRESS.

“Can a maid forget her ornaments?” Jer. ii. 32.

“Whose adorning let it not be that outward adorning of plaiting the hair or of putting on of apparel,” &c. 1 Pet. iii. 3.

SOME years ago, almost all women professing to be religious, thought it right to adopt a plain and even severe style of dress, especially in this country (Ireland); no “serious” lady then thought of putting a flower in her bonnet or a flounce to her gown, any more than of going to a theatre; and some went so far as to censure their young relatives or friends for wearing a frill or an end of red ribbon. They thought it a duty to inveigh against a poor girl if she purchased any but a brown dress, and seemed ready to quarrel with the very flowers for their glorious hues.

But opinions are much changed; from one extreme we are fallen into another, and instead of a distinction between the Christian and the worldling so marked as to be Phari-saical, we have no distinction at all; and the love of dress, so deeply engrained in woman’s nature, seems to have regained its unlimited empire. “Can a maid forget her ornaments?” Under many circumstances, one would certainly suppose that she might, but the inspired Word is fully borne out by facts. When a girl is about to enter on the responsibilities of a wife, does not her bridal dress too frequently occupy a larger share of her attention than anything else? and even in scenes of bereavement, is not the purchase and arrangement of mourning too frequently allowed to divert the mind from the solemn thoughts which alone should engage it at such times?

But all this, you will say, applies only to the worldly. No one who is really devoted to the Lord’s service, will

allow herself to be thus governed by the thoughts of outward adornment. Now granting this (which however we are hardly prepared to concede), is not there much remaining which hinders Christian women from being the example they ought to be to their children and servants, and all around them? What did St. Peter mean when he said, "Whose adorning, let it not be that outward adorning," &c.? Not that Christian ladies were to be clad in sackcloth, you say, nor that gold and plaited locks were literally sinful. True, but he must have meant *something*, and something applicable to ourselves as well as to the believers of his day, for we must not forget that the Apostle is but the instrument of the Holy Ghost, and that the Scripture is written for all.

Let us discuss the matter in a friendly spirit, and try to discover what is that golden mean between asceticism on the one hand and frivolity on the other. We question whether the weak sister is not oftener caused to err by the over-dressed appearance of really pious women, than by the still greater extravagance of the world's acknowledged votaries; and we know that the love of dress, which seems comparatively so trifling an error in *ladies*, is one of the chief causes of misery in a lower class, leading, as it does, to expensive habits,—to love of admiration,—and thence, too often, to bad company. Yet how can we preach to the poor, if we do not set them an example of sobriety in this respect?

The increasing cheapness and variety of "finery," is one of the features of this age. Our shops teem with useless additions to dress of every sort, so that even persons of very slender means can be as *fine* as their richer neighbours. Our churches look like gardens of tulips, or a naturalist's collection of butterflies, and the attention of the young or giddy is diverted from the preacher to the showy bonnets of the congregation. Now it is not that we suppose the true servant of God really spends as much thought or money

on her attire as the mere nominal Christian who attends church without a serious thought of the privilege ; but it is to be regretted, we think, that the *outward* appearance should in general be so much the same.

It is not easy, perhaps, to define what is "sobriety of appearance," but it is easy, at least, to know what it is not. Surely to wear what a little reflection and good sense would show to be unsuited to our age is not "sobriety!" Yet how constantly do we see women, long past youth, filling their bonnets with roses and sweet peas, and seeking all the most brilliant and delicate colours, as if on purpose to contrast unfavourably with their time-worn faces! It is a fact, obvious to every person of taste, that the few women who really do suit their dress to their age, look both younger and more attractive than their gayer acquaintances ; and certainly nothing is a better lesson for girls just entering life, than to see their mother gradually laying aside youthful trappings, and, by degrees, adopting the grave attire becoming her advancing years. But it is chiefly to the young that we address ourselves. The elderly lady who has bought a fresh wreath of blush roses for every succeeding summer during twenty years, is not likely to be persuaded to lay them aside by us, even though her thoughts be really fixed on better things ; habit has become second nature, and she cannot perceive the extreme unsuitableness of grey hair with garlands of flowers. We would, therefore, suggest to the young woman who is beginning to feel that life has an end beyond amusement and admiration, to look into this feminine concern *before* her habits are unalterably fixed. Let us see if there be no medium between the extravagance and gaudiness of dress in the present day, and the starched severity of the old Puritans. It seems to us that the Christian woman may, if she wishes it, be as happily independent of the world in this point as she is in other things, and that

she may *follow* the fashions of the age without being *led* by them. Now we know many young persons whose allowance is too small, they say, to permit them to spend anything in charity, and who yet always appear in the extreme of the fashion; much of their time and thoughts is, of course, consumed in the alterations of dress necessary to keep them thus on a level with their richer acquaintance, and more injury is done to their minds than if their purses allowed them to obtain such luxuries without any contrivances. Are not such girls *slaves* to Fashion?

It is natural and harmless, indeed, that a young woman should wish to look well in the eyes of those who love her, and like a lady to every one; but if she will try the experiment, she will be surprised to find how many etceteras may be cut off from her expenditure without rendering her either less pleasing or less lady-like; we might almost venture to affirm that the contrary would be the result. We do not advise her to banish all cheerful colours; the eye has a natural pleasure in them which it is reasonable to indulge in moderation (especially for young people); but in our days there is a degree of *showiness* in dress which seems to us beyond moderation, so that it is impossible to be in the *height* of the fashion without being exceedingly gay, if not actually gaudy.

If you desire to be *unobtrusive* in your appearance (and we think a Christian woman of whatever age ought to desire this), you will be wise in avoiding all showy and conspicuous colours in dresses of rich or even lasting material (especially if you reside in a town); for the same person who looks modest and simple in her country dress of pink or blue print, appears showy, if not actually flaunting, in silks of the same lively hues. We cannot help wondering that as advancing years bring successive sorrows and successive bereavements, that they should not also bring an

increasing sobriety of taste in attire, but it is not so; and, as the distinctions of youth and age seem now broken down, and the eye is accustomed to combinations at which Titian or Murillo would have shuddered, it is best to take a higher ground than good taste alone. We would, indeed, take the highest ground, and no other, but that the error not being very definable, the inferior arguments against it are wanted partly as explanations.

If we could know how much the opinions of others are unconsciously influenced by our dress, simplicity would perhaps have more votaries. For instance, a servant girl comes after a place in a quiet, religious family; and by way of looking her best, appears in as much vulgar finery as her limited purse allows, her object being apparently to look as unlike what she really is as possible, unaware that she is not the more like a lady for being unlike a respectable housemaid, or that if she were, she would fail of being hired as a servant. The mistress laughs at this folly, yet is she not encouraging it by example, if, while advising her attendant to be plain and economical in dress, she is herself procuring every *chiffon* that appears in the shop-windows, and making as great a point about the matching of a ribbon as if the fate of an empire depended upon it? Can she she reasonably wonder if her servant considers dress as a matter of the deepest importance, and "looking well" as a more serious affair than "doing well?"

Too many mistresses, however, forgetful of the terrible evils frequently resulting from a passion for finery in servant girls, put temptation in their way, by giving them articles of useless frippery unfit for their station, and letting them wear artificial flowers, &c., so that the modest-looking maid-servant we remember in our childhood is now quite a pleasing rarity to encounter.

Then, again, we frequently meet with women as objects of

charity who present themselves bedizened in dirty finery, and, on inquiry, learn they were once domestic servants in good families : we suspect that had the money they then spent on lace veils and silk mantles been laid by, they would never have sunk to such wretchedness ; but they had probably never had good examples, and we know how much better is example than precept. Let our servants see, that our dress is suited at once to our fortune, to our station, and to our sober views of life (we speak to Christian mistresses only), and we at least shall be clear from blame.

In our own rank of life the influence of dress on children and young people is much greater than many are apt to suppose : a feeling of which they are hardly conscious often crosses their mind, that Mrs. Such-a-one cannot *really* be so very good and “unworldly” as they are told, or she would not be “so much too fine for her age ;” or that “Miss So-and-so, though she is so fond of religious meetings, may only go to them to show off her splendid bonnets !” The accusations may be quite false ; but is it not a pity to cause the young and feeble to offend ?

Do we not ourselves feel a momentary chill and disappointment when,—on being introduced to a young lady of whose charitable labours and devoted life we have heard—the image of modest simplicity we had unconsciously formed, is overthrown by the appearance of as showy and determined a votary of fashion (judging from her exterior) as ever frequented a ball-room ? Is this suitable for one who goes about among the poor ? Could she not be traced for half-a-mile down the street ? Yet surely those who draw their views of woman’s place and duties from Scripture, which so clearly shows the modest position intended for her, should *wish* to be unobtrusive in their dress.

Only try the experiment for a year or two, Christian reader, and you will, we think, be very disinclined to aban-

don your modest attire, and be again the slave of the world in this respect, for you will find that you gain far more than you lose. In the first place, you will save money; when you no longer buy *every* novelty that appears, you will discover how many purchases you formerly made were mere sacrifices to the idol Fashion. Besides, when all your dresses of lasting materials are of quiet hues, you will cease to require the incessant change of trimmings, ribbons, &c., which more decided and lively colours made necessary; your sober-tinted gown seems like the atmosphere—it is a background suited to everything,—and far from looking what young ladies call “dowdy,” the cheerful ribbon with which you relieve it will be more pleasing to the eye, and your general appearance more agreeable and lady-like than before, while the money you have thus saved may be spent in a more satisfactory way.

Then you will be able to speak with far more effect to the poor or the ignorant—to the vain servant girl, whose love of finery is drawing her towards the pit of perdition—to the young governess who is spending her small salary in outward adornment, instead of trying to save for sickness or old age—to the poor country girl who wants to cast aside her comfortable and becoming costume of native manufacture for the tawdry town bonnet and flounced skirt—to all, in short, who come in your way, you can speak with some chance of doing good, because you set them an example, and are as suitably and modestly clad for *your* condition as you wish them to be for theirs.

We can venture also to assure you that if always neat in dress, you will meet with much less opposition than you may expect from your mother, husband, and friends—more especially if the ornament of a meek and quiet spirit, so strongly enjoined by the inspired writer, be adopted to supply the place of some that you have laid aside.

And lastly,—we have kept the highest motive for the last,—you will not now feel a twinge of conscience (as we often have, and daresay you have sometimes), on reading the words we quoted above, or any of the deeper censures on female dress in other parts of Scripture. You will feel that we cannot be obeying these words while we follow the world *as minutely* in this respect as do the very subjects of the Prince of this world ; and you will acknowledge, that if you were far from being one of the “careless daughters,” you yet resembled them too closely to be quite safe. And should your friends or young companions urge you to resume your butterfly appearance, and ridicule your quiet dress (which they may do from fancying it implies a censure upon themselves), you may smile as you reply, “I do not intend to be either singular or gloomy, but I cannot forget that I am a pilgrim, and I am walking through Vanity Fair.” L.

Dublin.

THE PARABLES OF KRUMMACHER.

OF Frederick Adolf Krummacher, the author of two small volumes of parables and a few less important things, one does not find much to report. The year 1768 brought him into the world at Tecklenburg, a town in Westphalia. And having studied and entered into the ministry, he became pastor, first in Elberfeld and then at Bremen, where he died. He is not to be confounded with his nephew, Krummacher of the “Elijah,” now one of the pastors of Berlin.

THE TWO WAYS.

The teacher of a little village in the Rhine-land stood once in his school and taught, and the sons and the daughters of the village sat round him and heard him gladly ; for

his teaching was vigorous and friendly. But he spake of the good and the evil conscience, and of the soft voice of the heart. And as he had now finished his discourse, he spake to his scholars: "Which of you can furnish a likeness for all this?" Then a boy stood forth and said, "I could indeed rehearse to you a comparison, but I am not sure whether it be a proper one." "Tell it only in thine own fashion," said the teacher; and the boy began:—

"I compare the peace of the good, and the unrest of the evil conscience, to two ways which I once went. As the enemy's troops were marching through our town, they had carried off with the rest my dear father and our horse. And when the father did not return home, mother wept and lamented sore, and so too did we all, and she sent me to the city to inquire of tidings concerning the father. I went, and it was late in the night, ere, with sorrowful heart, I was returning home again: for I had not found my father. It was a dark night in late autumn; the wind roared and howled amid the rocks and pines, and among the rock-cliffs, and the night-ravens and the owls were crying; but the thought of the dear father we had lost, and of the mother's sorrow when I should come home alone, filled my heart. Then I shuddered wonderfully in the gloomy night, and the sound of the rustling leaf affrighted me, and I thought within myself it must be somewhat so with the man who has to do with an evil conscience."

"Children," spake then the teacher, "would you like to wander alone in such a dark night, when you have sought the Father in vain, and only the voice of the storm, and the cry of the beasts of prey sound to meet you?"

"Ah, no," cried the children all at once, and shuddered.

Thereupon the boy began again to relate, and said,—
"Another time I went the same way with my sister, and we had brought with us from the city all manner of fine things

for a private festivity which our father was preparing for our mother's birth-day on the morrow. And it was late evening this time also as we were coming home; but it was in the Lent month, and the heaven was beautiful and clear, and soft and still as in a little chamber, so that we could hear distinctly the motion and the murmur of the little streamlet that flowed by the way, and in the bosky glen around us the nightingales were singing. But we two walked hand-in-hand together, so glad that we could hardly speak. And our loving father came out also to meet us; and now I thought in myself, so must it be in the heart of the man who hath done much good."

So spake the boy. Then the teacher looked with a friendly air upon the children, and the children said together, "We also will be good."

LIFE IN DEATH.

Dora was a God-fearing and lovely maiden. All who knew her loved her; most of all her brother Edmund, who was yet a little boy, and she too loved him with an affection no less hearty. Suddenly Dora fell sick, and Edmund was sorely grieved to behold her sufferings. For it did not enter into his heart that she could die; for he had never seen one dead, neither knew he yet what was the meaning of death. And as Dora lay full of pain upon her bed, Edmund took thought how he might cheer her a little, and he went out to the fields to seek for flowers; for he knew well she had a great love for flowers.

But when he was yet in the field she died, and they arrayed her in her white death-shroud.

Then Edmund came softly into the room where she lay. And he showed first the flowers from afar; but the maiden regarded them not. Then he called, "Look, Dora, what I

have brought thee," but she heard not. And Edmund went nearer and looked upon the maiden, and said, "She is asleep; I will lay the flowers upon her breast, that she may have joy of them when she awakes, and then she will say, 'Edmund hath done this.'"

And so he did gently and smiled. Thereupon he went to his mother and said, "I have plucked flowers for Dora, such as she loves the best; but she is asleep, and I have left the flowers lying on her breast, that she may be glad to behold them when she awakes."

But the mother wept and said, "Yes, she sleeps indeed; but she will not awake any more." But Edmund said, "If she be asleep, how should she not awake?"

So spake the boy, but the mother had nought to answer him; for she had covered her head and was hiding her tears. And the boy marvelled much thereat and said, "Mother, why weepest thou?"

THE KING'S GARDEN.

The wise Gamaliel was once instructing a band of Jewish youths, his disciples. The youngest amongst them, who had a zeal for the law, and the works of the law, though "not according to knowledge," inquired of the teacher, "Master, wilt thou tell us wherefore it is that our God hath not affixed to each particular good work its own special and peculiar reward?" And the wise Gamaliel said, "I will endeavour to answer this question, as is my wont, by a parable."

The disciples were hushed in reverent silence, and the teacher spake thus: "In a distant clime there lived a king who desired to lay out, around his palace, a spacious and splendid garden. He invited labourers into it, and left each one free to put into the garden whatever tree, or shrub,

or plant, he liked best; the only conditions being, that nothing should be planted there that was not pleasant to the eye, nor good for food, nor of healing virtue; and that the garden should be fully stocked, and not one spot be suffered to lie waste. The work went rapidly on; and when it was fully completed the king came to inspect it. He found it stocked abundantly:—the most common vegetable, the rarest exotic was there; every plant from the lofty cedar to the humble hyssop. And he called the labourers; and as each pointed out the vegetable, the flower, the tree which he had planted, he rewarded each man according to his work.”

The teacher was silent. “How is this an answer to our question?” said the disciples. “Is my meaning hidden from you?” returned the master. “Think once again; and you will perceive that had the king named a specific reward for each particular plant, every one of the labourers would have thought only of that to which the highest reward was affixed; and the result would have been that the king’s garden would have presented to the eye a dull and cheerless uniformity, instead of the diversified beauty and varied utility which made the good king’s heart glad, as he gazed upon the work of that voluntary choice, which, impelled, as all were, by the one motive of grateful obedience to their gracious Lord, made every plant a free-will offering on the part of his servants. Now you have only to suppose our Israel to be this garden, and we, the called and chosen people, to be the labourers, and you have an answer. As in the natural, so in the moral creation, it is the will of the Creator that everything should not be alike; diversity of gifts and diversity of operation, producing infinite variety.”

THE CARNATION-BED.

“Oh, mother, give us each a little flower-bed that may belong to ourselves,—one to me, and one to Gustavus, and to Alvina one, and then we shall each look after his own.”

So spake little Fritz to his mother; and the mother granted him his request, and gave to each a flower-bed full of beautiful carnations. And the children were rejoiced above measure, and said, “When the carnations are once in flower, that will be a grand affair:” for it was not yet the time for carnations, and there was nothing yet but buds. But little Fritz was of impatient disposition and could not wait till the time of flowers, and he wished that his flower-bed should blossom before all the others. And he went to them, and took the buds in his hand, and looked at them in their unopened calices, and was much rejoiced if a petal were peeping forth red and yellow from its leafy envelope. But it lasted too long for him; so Fritz broke open the buds and spread out the petals from one another. And now he cried with a loud voice, “Behold, my carnations are in flower;” but as the sun shone upon them, the flowers bent their heads and were sorrowful, and stood dishevelled and faded ere it was noon. And the boy wept for them.

But the mother said, “Thou impatient child! may these be the last joys of thy life which, by thine own blame, thou destroyest for thyself! Then hast thou bought the great and important art of waiting not too dearly.”

W. H.

REVIEW OF THE MONTH.

A VOLUME of poems has issued from the Edinburgh press which shows that there still are true minstrels in the land of Burns. Mr. Ballantyne's Lyrics are in the Doric vernacular, and, set to music, many of them have already attained a wide popularity. They deserve it. Sparkling with wit, overflowing with pathos, and often rising to a high strain of sublimity, they are free from the blemishes by which Scotia's bard is unhappily disfigured, and leave in the mind of the reader feelings noble, benevolent, and patriotic.

"Men of the Time" is a most useful manual of contemporary biography. In a dense but convenient volume it gives sketches of upwards of a thousand living personages, including all the more distinguished authors, artists, lawyers, divines, statesmen, and public characters of Europe and America. Many of the articles are written with great spirit and ability, and form an amusing and instructive beguilement for a leisure hour; whilst on the library table we have no doubt that the work itself will be deemed an indispensable book of reference.

A second part of "Passing Thoughts" by Mr. Douglas of Cavers, has just appeared. It is long since we have met with anything so worthy of the consideration of the Christian citizen as the section on "Britain and the World;" and the philosophical historian will be charmed with "France and the Democracy," and "The Moors in Spain." To our taste nothing can be more delightful than the contributions with which Mr. Douglas has enriched our literature. With a remarkable range of information, there is an entire absence of pedantry; and in conjunction with unusual inde-

pendence of thought and freshness of feeling, there is the deepest spirituality of tone—a bright and all-pervading piety. Historians and statesmen are seldom devout, and good men are often ill-informed. The union of knowledge with holy and benevolent purpose creates that rare but much-needed combination—the enlightened philanthropist, the Christian statesman. In reading the works of Mr. Douglas, we feel ourselves on an unwonted elevation, from which the horizon of the past as well as the future is widely commanded, and from which there is a clear atmosphere towards heaven. Such is the true “Excelsior.”

Mr. Motley, a fellow-countryman of Washington Irving and Prescott, has published “The Rise of the Dutch Republic,” a history in three well-filled octavos. The tone of the book is too jaunty and flippant, and fine passages are too often disfigured by a bombastic imitation of Carlyle. Still it is a work of remarkable vividness and animation, and tells, as it has never before been told to English readers, the Revolt of the Netherlands.

At the instance of Earl Stanhope, it is likely that steps will now be taken to secure for the nation a portrait-gallery of British worthies. For this the materials are ample, and, if vigorously carried out, the collection will be a magnificent supplement to Westminster Abbey, and will furnish the public with a sort of pictorial *Biographia Britannica*.

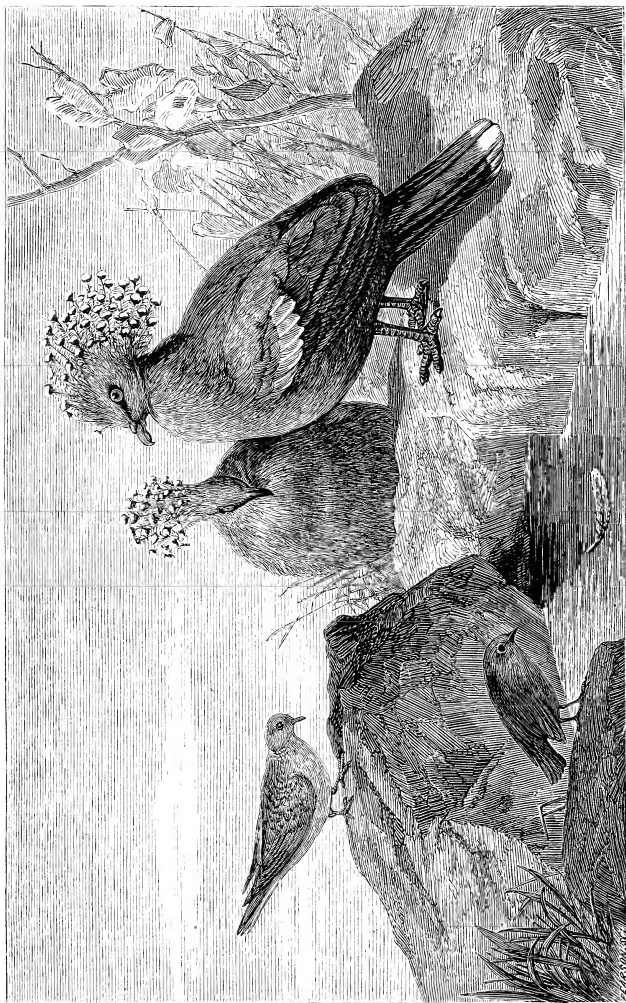
As the result of experiments carried on at Harton Colliery, the Astronomer Royal gives the weight of the earth as 6.716. This is considerably higher than the results obtained by previous experimenters. Cavendish fixed it at 5.448, and Baily at 5.660. According to Mr. Airy, our planet is nearly equal in weight to seven globes of water of the same size.

A committee of the Epidemiological Society is endeavouring to secure for the labouring classes a better style of nurses during the prevalence of epidemic and other sickness.

The object is extremely important, and one means which the committee suggests is the training as nurses the more respectable female inmates of workhouses, who, throughout the kingdom, amount to many thousands. It is sad to think of the forlorn condition of many poor families in times of sickness; the father obliged to ply his work all day, the mother and some of the children prostrate in fever, and the household left to the tender mercies of a dishonest or drunken hireling, or more frequently unattended altogether. Nor is there among "common things" anything which more needs to be taught in the homes of common people than skill and tenderness in the treatment of the sick; nor will the best medicine be of much avail as long as there is no one in the house who can adjust a pillow or prepare a gruel. In fairness we ought, perhaps, to add that improved dwellings must go hand in hand with improved attendance on the sick; for even the best nursing will not much avail in a fetid hovel, or in a sultry garret resounding with uproarious children.

"Honour to whom honour is due" is always a pleasing record. Most theologians lamented that so little was done in his life to recognise the great learning and prodigious industry of the Rev. G. S. Faber. We are, therefore, gratified to hear that a chaste Gothic monument, executed by Mr. W. T. Hale, has now been erected to his memory in Sherburn Chapel, Durham.

Nothing daunted by the disasters with which the biographies of Captain Gardiner and Richard Williams have made many of our readers so familiar, the Patagonian Mission is still vigorously prosecuted. A little mission colony has been established on Keppel Island, one of the Falklands, and from the prudential precautions which have been adopted, we fondly hope that success will crown the effort. The Rev. G. Pakenham Despard goes out as the first clerical missionary.



The Queen's Pigeon (*Goura Victoriae*) and Turtle-Dove.

COLUMBIDÆ, OR PIGEONS.

It is a frequent, and, we think, defensible practice, with people of whatever profession or pursuit, to laud and magnify their own occupations, as of higher interest and importance than those of their neighbours. It is the same thing in relation to the different departments into which human knowledge is now divided. Each inquirer maintains the higher merit of that which he most loves, and with which he is best acquainted. In natural history, it is no doubt the very perfection of the Divine workmanship which induces each observer to feel what he cannot but regard as the *surpassing* dignity and worth of his own particular department. In proportion to the interest and assiduity with which things are studied, are also to the student's mind their value and importance. It is long since Dr. Chalmers instructed us in the fact, that whatever the walk of philosophy may be on which man shall enter, that is the walk which he conceives to be most enriched by all that is fitted to entertain the intellect, or arrest the admiration, of the enamoured scholar.

“The astronomer,” says that great divine, “who can unravel the mechanism of the heavens; or the chemist, who can trace the atomic processes of matter upon earth; or the metaphysician, who can assign the laws of human thought; or the grammarian, who can discriminate the niceties of language; or the naturalist, who can classify the flowers, and the birds, and the shells, and the minerals, and the insects, which so teem and multiply in this world of wonders;—each of these respective inquirers is apt to become the worshipper of his own theme, and to look with a sort of indifference bordering on contempt towards what he imagines the far less interesting track of his fellow-labourers. Now, each is right in the admiration he renders to the grace and grandeur of that field which himself has explored; but all are wrong in the distaste they feel, or rather in the disregard they cast on the other fields which they have never en-

tered. We should take the testimony of each to the worth of that which he does know, and reject the testimony of each to the comparative worthlessness of that which he does not know ; and then the unavoidable inference is, that that must be indeed a replete and a gorgeous universe in which we dwell ; and still more glorious the Eternal Mind, from whose conception it arose, and whose prolific fiat gave birth to it in all its vastness and variety." *

We sometimes feel ourselves peculiarly placed—almost in a *predicament*, as it were, while endeavouring to record the beauty and excellence of different families of the feathered race. They are all, in truth, made up of such exquisite materials that each, while we view itself alone, seems to be about the fairest thing on earth ; and so, if we should now say that the pigeon tribe are the *most* beautiful of birds, no doubt some tenacious reader of "Excelsior" may possibly be able to point out that we have already said the same thing both of Parrots and Humming-birds. We cannot help it. At present pigeons actually are the most beautiful birds with which we are acquainted. Their bills are more slender and delicately formed than those of parrots, their eyes more mild and gentle, their voices more plaintive and melodious, their forms, from the smallness of their heads, more proportionate and better balanced, their gait easier, and their gestures more graceful. Though less splendidly metallic than humming-birds, they fill the eye more fully from their ample size ; and, in consequence of their hardier constitution, they occur in almost every quarter of the globe, thus dispensing their radiance not alone beneath the brilliant sunlight of the tropics, but in far northern cloudy lands, irradiating many a dark-browed cliff—

"With lustre of a saintly show."

Pigeons present a vast disparity among themselves as

* "On the Adaptation of External Nature to the Moral and Intellectual Constitution of Man," (Bridgewater Treatise), vol. ii. p. 173.

regards both size and general aspect, although there is a certain family likeness which, as in all natural groups, pervades the entire assemblage. There is one species scarcely larger than a lark, while another seems almost as big as a small turkey. They are all distinguished by their great power of swift and long-continued flight. They are invariably monogamous, that is, associated in pairs; and both sexes take a share in the hatching of the eggs, which, with few exceptions, are only two in number. They build on trees, rocks, or ruins, according to their kind. The young are fed after a somewhat peculiar fashion. The crop of the parents is furnished with numerous glands, which become developed during incubation. These glands secrete a kind of milky matter, with which the food received into the crop is moistened, and afterwards regurgitated into the mouths of the offspring.

The position of pigeons in systematic ornithology is somewhat unsettled. By Cuvier, and many other modern writers, they have been placed among the gallinaceous tribes; that is, poultry, game birds, &c. But both in general aspect and particular modes of life, they are very dissimilar. We need not further allude to their surpassing powers of flight, so different from the *terrestrial* habits of those just named. The very limited number of their eggs, the alternate incubation of these by both parents, and the helpless condition in which the young are hatched, are facts in their constitutional history which we fail to find in that of the *Gallinae*. At the same time species occur, as we shall ere long notice, of an aberrant character, which certainly connect them more or less with the gallinaceous groups.

The old and unrestricted genus COLUMBA is one of the largest and most widely-spread with which naturalists are acquainted. It is diffused alike over Europe, Asia, Africa, America, Australia, New Guinea, Malacca, the Celebes,

and almost every other distant island of the sea. We should, therefore seek in vain, within the assigned limits of "Excelsior," to present an adequate view of their beauty and abundance, and so must limit ourselves to a brief selection of species, "few and far between," to exemplify their distribution over the surface of the earth.

It is in the tropical climates of Southern Asia and the Indian Archipelago that we meet with the greatest variety and the most sumptuously adorned of the pigeon tribe. In these warm and genial climes, they find a never-failing supply of the most fitting food. We there recognise the thick-billed kinds (genus *Vinago* of Cuvier), which almost vie with the parrots in splendour, and luxuriate among the umbrageous boughs of the banyan and other trees, whose fruit is accordant with their tastes. There also occur the small and beautiful turtelines (genus *Ptilinopus*), and the large *Carpophagæ*, or fruit-eating species. Amid the scented air of the Spice Islands, we meet with the great crowned Goura (*Lophyrus coronatus*), the most magnificent in respect to size of all the *Columbidæ*, as it measures nearly two feet and a half in length. In the same odoriferous region we find the singular Nicobar pigeon (*Geophilus Nicobaricus*), so remarkable not only for the metallic splendour of its plumage of golden green, cupreous, and purple red, but also for the rapid way in which it runs along the ground, and its exceptional character in laying *several* eggs, and these producing young ones fit to follow their parents immediately after being hatched.

Africa abounds in beautiful pigeons, among which one of the most remarkable is the carunculated ground pigeon (*Geophilus carunculatus*), discovered by Le Vaillant in the Namaqua country. It shows a decided affinity to the gallinaceous tribes in possessing a pendent wattle beneath the bill, and in laying six or eight eggs *upon the ground*,

the young being active and feathered from the first, and feeding not only on grains and berries, but on ants and other insects. In the West Indies we have several interesting species, some of which occur also widely spread through South America, which, at the same time, cherishes many peculiar to itself. The northern division of the New World is well supplied with birds of this family, of which the passenger pigeon (*Ectopistes migratoria*), so famous for the movements of its congregated groups, is one of the most remarkable.

The European species may now be slightly noticed in detail, as they are not more than four in number, all of which are found in Britain.

1st. The ring-dove, cushat, or wood-pigeon (*Columba palumbus*), a large and handsome species, very generally distributed over the more or less wooded districts of our island, but avoiding bare and rocky regions. It breeds on trees, in single isolated pairs, but becomes gregarious to a great extent in autumn, forming large, and, we hope, happy families—unfortunately very destructive to the “agricultural interest,” from their too great love of turnips and their leaves, in frosty weather. Though a wary bird of powerful wing, not always easy of approach even amid the screened recesses of its forest glades, yet it often builds confidently in the immediate neighbourhood of human dwellings. Indeed, the exact nature of its nestling places cannot be definitely indicated, so various is their choice. According to Mr. Watterton, whose forte lies in such observations, no bird in the British dominions resorts to so many trees and shrubs for the purpose of incubation: “Not a tree, from the towering pine to the lowly thorn, ever comes amiss to it.” As yet all attempts to reclaim this beautiful species have failed. It seems to be beyond the power of man to make it breed within a dove-cot. It must have leafy umbrage of some

kind or other, and prefers a few withered sticks to all the architectural solidities of stone and lime. It was to the deep cooing of this kind that we owe the often-quoted line of Wordsworth :—

“ Over his own sweet voice the stock-dove broods.”

The actual stock-dove does not occur in the north of England, where, however, the cushat, or wood-pigeon, is well known, and rejoices in those secluded sylvan dells, which border the “ Rydalian laurels.”

2d. The rock, or wild pigeon (*Columba livia*). This species is no doubt the origin of our ordinary domestic pigeon, and is therefore the true *stock-dove*, though not so called. Despising all the leafy glories of the forest, it takes up its abode among the cliffs and caverns by the billowy shore; and if transferred when young to a dove-cot, will remain there, and pair with the domesticated variety, from the ordinary blue condition of which it is scarcely distinguishable by any difference in aspect. On the other hand, that variety, if neglected, or much disturbed, will swarm away from its ancestral home, and take up its abode among rocks, or ruins, or beneath the “ pillared shade” of churches or other lofty buildings.* But nothing will induce it to nestle upon a tree—a fact sufficient to prove that the so-called stock-dove of England, which is an arboreal species, is not identical in kind. This partiality for stony places is beautifully indicated in the Song of Solomon: “ O my dove, that art in the clefts of the rock, in the secret places of the stairs.” (ch. ii. 14.)

* “ The St. Mark’s porches are full of doves that nestle among the marble foliage, and mingle the soft iridescence of their living plumes, changing at every motion, with the tints hardly less lovely that have stood unchanged for seven hundred years.”—RUSKIN’S *Stones of Venice*, p. 66.

The species is very widely spread along the European shores, from Shetland to the Levant. It is well known in Northern Africa. Temminck has received it from Japan, and we can certify its occurrence in Madeira and Teneriffe. It is distinguishable, even at a distance, by the pure white colour of the lower portion of the back. The majority of those which inhabit our dove-cots present precisely the same conditions of plumage. In their semi-wild state, where they enjoy perfect freedom of action, and are nearly dependent on their own exertions for support, they can scarcely be called reclaimed, much less domesticated. Man, as Mr. Selby has well observed, has only taken advantage of certain habits natural to the species, and by the substitution of an artificial for a real cavern, has, without violating the conditions of its original state, brought it into a kind of voluntary subjection, and so rendered it subservient to himself.*

It is under this head that we may place a brief record of what are called *fancy pigeons*, that is, the numerous fantastic varieties which have grown up under the fostering care of man. The fan-tail, or shaker (*Col. tremula laticauda*), is distinguished by the number and expansion of its tail-feathers, and the power which it possesses of raising and spreading them upwards with a tremulous motion, as the peacock does its star-eyed plumes. Its colour is usually white. A small and elegant variety is called the Capucin (*Col. cucullata*), and is characterised by a reverted hood, or wreath of feathers, around the head, which descends, boa-like, down the anterior neck, and meets on the middle of the breast. The bill is very short, the legs unplumed, the hue various, often white, with cinnamon-coloured markings. The most highly-prized are pure and glossy white. The pouter, or cropper (*Col. gutturosa*), is distinguished by the faculty of largely inflating the œsophagus, so as to

* "Naturalist's Library," v. 148.

blow out the expanded breast, till it almost equals in size the rest of the bird's body. It is an unproductive breeder and an indifferent parent, being so taken up with its own power of magnification as to neglect other and more important concerns. How often emptiness and self-esteem are found to go together! The *carrier* pigeon, so called, seems to have belonged originally to a Turkish variety. It is a large and powerful bird, with lengthened wings, and a bare space around the eyes. Constitutionally, it is distinguished by the instinctive strength of its local attachment, which induces it to return, unerringly, from a great distance, through the pathless air, to any accustomed place from which it may have been removed. It has thus been made the means of conveying intelligence of various kinds—of battles lost or won—of affections deep as life—or the “trivial fond records” of the race-course and the cock-pit. All these, and innumerable other varieties which we cannot here notice, are supposed to owe their origin to the art of man. By assorting and pairing together certain peculiar, though accidental kinds, that is, by what is called “breeding in and in,” such varieties have become so fixed or permanent as each to reproduce its own likeness. On the other hand, if left to themselves, they will breed together, and *invariably produce fertile young*, which they would not do if originally of different species.

3d. The smaller wood-pigeon (*Columba œnas*), by some erroneously considered as the stock-dove, is much more restricted, at least in its British range, than either of the preceding, being as yet unknown in Scotland, while in England it is confined to the southern and midland counties.

4th. The turtle-dove (*Columba turtur*), a well-known migratory species, which visits the southern portions of England late in spring, and departs about the end of August, having previously bred on high trees, amid thick and

sheltered woods. It is a small and delicate creature, denied to bleak Caledonia. We believe it does not remain during winter in any part of Europe. The turtle-dove, so frequently engaged in this country, is another (and not a British) species, called, from its peculiar kind of cooing, the laughing turtle (*Columba risoria*). It breeds very readily with us in confinement, but, of course, requires protection from the winter's cold. It is common in many Eastern countries, and is well known in Palestine and the Levant. One or other of these two kinds is undoubtedly the "turtle-dove" so frequently mentioned in the sacred writings as distinct from the "pigeon," with which, however, it was offered up in sacrifice. It is frequently referred to in the Psalms. "O, deliver not the soul of thy turtle-dove unto the multitude of the wicked" (lxiv. 19); and more directly in the Song of Solomon, in a verse which with few words affords us so many beautiful indications: "The flowers appear on the earth: the time of the singing of birds is come, and the voice of the turtle is heard in our land." (ii. 12.)

A very brief notice must now suffice of a few of the *Columbidæ* which dwell in far countries.

The famous passenger pigeon (*Ectopistes migratoria*) of North America, occurs casually in Britain. In its native country it is spread from the twentieth to the sixtieth, or even sixty-second degree of north latitude, and both breeds and migrates in countless myriads. Its movements are said to be affected not so much by change of season or temperature, as the absence or sufficiency of food. "I know at least for a certainty," says Audubon, "that in Kentucky they remained for several years constantly, and were nowhere else to be found. They all suddenly disappeared one season, when the *mast* was exhausted, and did not return for a long period." One of the most remarkable facts in the history of

the whole pigeon tribe, is the extraordinary flocks in which this species is sometimes found. Alexander Wilson estimated a *flight* which continued to pass over him for the greater portion of the day, to have been a mile in breadth, and 240 miles in length, and to have contained (three birds being assigned to every square yard) at least *two thousand two hundred and thirty million two hundred and seventy-two thousand pigeons!* That number, when killed and cooked, would have afforded (with a sufficiency of flour and butter) a *pie* for every human being, man, woman, and child, now existing upon the face of the earth. The lamented Audubon confirms Wilson's statement by a still more extraordinary narrative, and adds, that as each pigeon consumes fully half a pint of food (chiefly mast), the supply which his flock would have required amounted to *eight millions seven hundred and twelve thousand bushels per day*. We may judge from this of the difficulties which sometimes beset a "protectionist farmer" in the Far West.

The places frequented as feeding-grounds by these passenger pigeons are called pigeon-roosts. There the surface is covered to the depth of several inches by their dung, all grass and underwood are destroyed, and even the forest-trees are ere long killed over thousands of acres, as completely as if they had been girdled by an axe. The breeding-places are usually fifty or sixty miles off. Wilson describes one which he visited in Kentucky. It was about forty miles long, and several miles in breadth, every tree being loaded with nests, the ground strewed with broken branches, eggs, and *squabs* (as the young are called) which had fallen from the nests, and had attracted numerous herds of hogs, which were fattening on them. From about twenty feet above the ground, and upwards to the tree-tops, there was perpetual tumult, and a roar, resembling that of thunder from innumerable wings, while birds of prey were gliding

and darting to and fro, seizing upon the poor defenceless squabs at pleasure. There might sometimes be a hundred nests upon a single tree, and the frequent fracture and sudden fall of overloaded branches made walking beneath them a dangerous occupation. The vast productiveness of these birds may probably be occasioned by their breeding several times in every season.

Of the African species one of the most magnificent is the *hackled* pigeon (*C. Franciæ*), so called on account of the peculiar form of the feathers on the head, neck, and breast, which are long and narrow, and terminate in a shining appendage, resembling in consistence, though not in colour, the tips of the wing-feathers of the waxen chattering. It inhabits South Africa, and has likewise been found in Madagascar. Another singular species is the parabolic pigeon (*C. arquatrix*), figured and described by its discoverer M. Le Vaillant. It is distinguished by its peculiar mode of flight. It never cleaves the air, like most other pigeons, in a straight line; but on commencing its route describes a parabolic curve, and continues forming a series of arcs, showing most extraordinary activity and power.

Captain Sturt has recorded of *Phaps histrionica*, a species of Australia, that it collects in large flocks during the months of March and April, living on the seed of the rice-grass, which the natives also collect for food, and that during the short period of the harvest the flavour of its flesh is delicious. Although it never fails to fly to water during these sultry sunsets, it *merely wets its bill*; and it has often excited the wonder of the parched and way-worn traveller, that so insignificant a supply should suffice to quench its thirst amid those burning plains. According to Mr. Gould, the bronze-winged pigeons, as they are so often called, not only yield an excellent viand for the settlers, but are a most providential boon bestowed upon the explorer of these almost

illimitable inland wastes, by directing him, through their unerring evening flight, to places where he may find some water, that element without which man cannot exist.

We must now conclude with a brief notice of the largest and most magnificent of the *Columbidæ*, which adorn our earth. These are the Gouras, or great crowned pigeons, included in the genus *Lophyrus* of M. Vieillot. They are in several respects an aberrant group, regarded by some as leading from the *Columbidæ* to the more gallinaceous *Cracidæ*. They resemble the latter in their gait, their elevated crest, short wings, and elongated tail. Indeed, Temminck has observed that, to convert the crowned pigeon into a Hocco or Crax, it was only necessary to substitute the bill of the one for that of the other. They far transcend in size the rest of their congeners. They are what may be called ground species, and are natives of New Guinea, Java, and other Eastern islands. The best and most anciently known is that commonly called the crowned Goura pigeon (*Lophyrus coronatus*). It inhabits forests, where it feeds on wild fruits, seeds, and grains. It builds in trees, and has only a pair of eggs at each hatching. The voice of the male is described as a hoarse murmur, a kind of cooing sound, accompanied by a peculiar guttural noise, apparently produced by the compression and forced ejection of air from within the thorax, something similar to that uttered by a proud and indignant turkey, when it struts stiffly round with uplifted tail and grating wings, supposing itself to be an object not of ridicule, but admiring wonder, to all beholders! It has been conjectured from this peculiarity of voice, that these Goura pigeons are probably characterised, like the *Cracidæ*, by the length and convolutions of the larynx. The species now referred to is not unfrequently brought alive to Europe by the Dutch from their East Indian possessions. But it is of a delicate constitution, and,

we believe, never breeds, and seldom long survives, in the comparatively moist and chilly temperature of Holland.

During recent years a still larger and more magnificent species of Goura has been introduced into our own country. It was described some time ago by Mr. Fraser as a new species, from the specimen in the Zoological Gardens of London. He named it the Queen's Goura (*Lophyrus Victorie*), in honour of Her Most gracious Majesty, our beloved sovereign. The general colour of this beautiful bird, native to New Guinea, may be described as an intense blue-grey, which becomes lighter on the head. The chest is deep chestnut. The larger wing-coverts are light blue grey, tipped with dark chestnut. The head is surmounted by a handsome crest, each feather of which is of similar construction to that of *Lophyrus coronatus*, but differs in being spread out into a spatulate or spoon-shaped form at its extremity, where the colour is blue, bordered with white. A dark streak passes along the line of the eye, of which the iris is vermilion.* We have figured this fine species on the woodcut prefixed to the present article, and shall here close our slight sketch of the *Columbidæ*.

J. W.

* "Annals of Natural History," vol. xv. p. 360.

LIFE.

THERE are some tendencies in the philosophy of the day which appear to us dangerous. They are the more so, perhaps, because we have the evidences of experiment brought forward to support the favourite view. Were it not that the tendencies, to which we allude, are found to a greater or a less extent in every work on natural philosophy, and physiology, and in many works on chemistry, we should not deem it necessary to speak of them.

We refer to the view entertained that Life—*the vital energy*—is merely the result of the combined operation of the physical forces; or, as is supposed by many, merely a modified form of *electrical energy*.

It appears to us, that a clear conception of the *visible* phenomena of Life may be arrived at by a little careful study of certain fixed conditions:—that such a study will tend to prove, that the vital force is not only, none of the physical forces under any modification, but that it is something which controls the action of them all; and, beyond this, it will teach us that that *which sees* will never be seen; that the power *which feels* will never be perceptible by human sense. We would consider Life in its lowest and in its highest form,—the little plant, which with its foliage and its flowers lends a beauty to external Nature, and Man, created to be the monarch of the world. Attempts have been made—but not hitherto in any instance with complete success—to draw the line between the vegetable and the animal kingdom. Linnæus propounded the law,—that plants *grow and live*, that animals *live and move*; but we know of plants which move, and of animals having no powers of locomotion. Chemists have drawn the distinction

by saying that plants yield oxygen to the air, and animals carbonic acid; but some of the lowest orders of animals yield oxygen, as the plant does, and a large variety of plants part with carbonic acid in the same way as was once thought to be peculiar to the animal alone. The vegetable and the animal races shade so gradually one into the other, that we cannot mark the ending of the first or the beginning of the last.

A vital power—Life—differing only in degree, is found pervading the entire system of organisation.

Let us commence our inquiry at the beginning:—the seed, with its latent life, buried in the soil. If we make a vertical section of a seed, we discover the *embryo* surrounded with starch and gluten. The seed is placed in the soil; darkness, a certain temperature and moisture are required for healthful germination. Let us mark what takes place; the seed swells, it develops heat, it becomes sweet to the taste, and it *gives out carbonic acid*.

A pile of barley, moistened, in a dimly-lighted place, will, as it germinates, develop heat, which a thermometer will show daily increasing. We know that the barley, in becoming malt, acquires *sweetness*; the fact being, that in germination the starch is converted into sugar, by the absorption of oxygen from the air. The seed, therefore, is in the condition of a burning body, consuming oxygen gas and producing carbonic acid,—a compound of carbon with oxygen.

Under these influences Life begins, and the embryo grows; *but neither the chemical action nor the heat are the Life*. The cotyledons ascend, the roots descend, and the plumula, or first leaf-bud, is forced above the soil; and the young creation, escaping from darkness, rejoicing in light, undergoes an entire change in its economy.

The plant now takes from the air, by its leaves, carbonic

acid; and under the influence of light it decomposes this carbonic acid, retains the carbon to form its wood, and sets the oxygen free into the air. It has frequently been stated that this decomposition of carbonic acid in the plant is due to light. It is only so indirectly. The plant, by virtue of its vital power, decomposes this compound air; but light quickens, by its mysterious powers, the living energies; and, as the light increases, the power of *decomposing* carbonic acid increases in a direct ratio, and it diminishes regularly with the diminution of luminous force; but during the entire life of the plant it never either by day or by night, ceases to effect this decomposition. During darkness, the life of the plant is in a condition of repose; this chemical action is at its minimum; with the first touch of the sunbeam it awakens into energy, as every fibre pulsates anew under the quickening power of the morning rays. We have the power of collecting the gases given off by the leaves from a plant, and thus of measuring the amount of action going on at any given hour. It has been found that if, when under the influence of bright sunshine each leaf upon a branch is sending forth its oxygen, a wound, merely a puncture with a fine needle, be made at the base of the branch, every leaf *is sensible of the injury, and its vital labours are checked.*

Surely we perceive something here beyond either Solar Light, Heat, or Chemical Action — an independent Vitality.

In the seed, all the phenomena of heat and chemical action may be established without producing *Life* (growth). Certain delicate conditions are required. In the dead plant we may have also an enormous amount of chemical action — Heat, and even Light developed, but yet no LIFE.

Man must be regarded as the highest type of the animal economy, and in every way he represents the conditions of animal existence in its most exalted form.

Lavoisier said, "The fable of Prometheus is but the outshadowing of a philosophic truth; where there is Light, there we find organisation and Life; where Light cannot penetrate, Death for ever holds his silent court."

LIGHT is especially necessary to the animal; the deprivation of it is fatal to his healthful existence. HEAT is necessary; and under all conditions of climate, a mean animal temperature is preserved by the processes of respiration and digestion. The carbon element of our food passes into the blood; it meets with oxygen in the lungs, and being virtually burnt, is passed off into the air as carbonic acid. By the process of combining carbon and oxygen, *Heat* is developed,—as it is in the burning of a coal or a candle.

Quarles, in his "Emblems," without being conscious of it, advances from imaginative Poetry to the purest and the truest Philosophy, when he pursues his emblem of the Taper, the type of Life.

Again, ELECTRICITY is manifested in every movement of the body, and almost in every effort of the mind. Hence it is, that some philosophers have supposed the brain to be a system of voltaic cells, and the nerves a series of conductors; the senses, indeed, being but the out-stations of an electrical telegraph, which convey along the wires intelligence to the great central station, the brain.

No one will deny the importance of all these forces,—Light, Heat, Chemical power, and Electricity, are necessary for the maintenance of Vital energy in the animal frame. They are a mysterious bond of forces—each having its especial function.

But in decomposing dead animal matter, we have all these acting with greater power than in the living system. The controlling power of LIFE is strikingly shown in cases of sudden, especially sudden violent death. A healthy man is thrown from his horse and killed on the spot—the gastric

juice in a few hours dissolves not merely the contents of the stomach, but the stomach itself. Life, the controlling power, is gone, and chemical action pursues unchecked its ravages.

Electricity is such a wonder-working agent, that it has become a sort of fashion to refer every phenomenon which we do not understand in some way or other to the influence of electricity. It cannot, however, be too distinctly stated that there is not, within the entire range of electrical enquiry, one experiment which proves that any of the functions of Life can be maintained by electricity. Experiments in support of the electrical theory of vitality have been published; but under the careful examination of properly guarded minds, the fallacy of these has in every case been shown.

The physical forces we can examine—we can torture them to tell us the secrets of many of their laws—we can chain them to our tasks, and compel them to do our bidding. We may advance to a more refined knowledge of these great natural energies than that which we at present possess, and we probably shall discover forces which are superior in action to those which we already know. But vital force cannot be detected by the natural philosopher—it cannot be traced by the anatomist or the physiologist—it cannot be analysed by the chemist. The greatest mechanician of us all cannot control it. We rashly attempt to grasp it—it eludes us, and a dead mass is all that is left us to study.

There are bounds beyond which the searching powers of the human mind cannot venture, and if human fancy on wild wing essays the proscribed region, it flutters in convulsions, and falls back to earth exhausted by its fruitless efforts.

The connexion, however, of all those great Energies, with both vegetable and animal life, must never be lost sight of, and we are enabled to trace all the physical forces to their source—the centre of the solar system—the Sun.

How completely does true philosophy interpret to man that which was mysterious in the Word of Revelation! Before the sun could send its radiant powers upon this planet, our Earth was a chaos—"without form and void, and darkness was upon the face of the deep; and God said, Let there be light; and there was light."

The immediate result was order and organization, beauty and life.

R. H.

PRAYER.

Poor suffering mortal, dry thy tears,
 Heed not the sting that wounds thy clay,
 Hope gently soothes when Faith appears,
 And, passion conquered, kneels to pray.
 Attendant angels listening wait
 To bear the trembling prayer on high—
 Its whispers leap the heavenly gate,
 And rapture rings along the sky.

By prayer the trackless sea of thought
 A glittering golden path is made,
 Through which the wandering soul is brought
 To Christ, of light the living head.
 There hosts redeemed in glory shine,
 And pealing hallelujahs raise
 To Him the Saviour all divine,
 And prayer is lost in songs of praise!

F. B.

ENGLISH LETTER-WRITERS.

JOHN NEWTON.

JOHN NEWTON'S career was one of singular vicissitude. The early scenes of it were crowded with adventures by land and sea, than which none more striking and varied were ever invented by Marryatt or Defoe; the later ones show him an earnest clergyman, a loving friend, and a successful author. The history of his inner life is as extraordinary. For years he lived without faith and without hope; a resolute, unhappy wrong-doer, a blasphemer, a spiritual castaway; his later life was pervaded by that serene happiness which only comes from closest walk with God.

He was born on the 24th July, 1725. Like his future friend Cowper, he had the misfortune to lose his mother before he was seven years old. She was a pious woman, and taught him carefully. His father, on the other hand, was an austere man, and terrified the boy. He was captain of a Mediterranean trader, and was upon a voyage when she died. On his return he married again, and on the eleventh birth-day of his little son his father took him to sea.

Ignorant, wayward, uneducated, and passionate, he was now surrounded by the worst possible influences, and we do not wonder to hear that he soon threw aside all pretence to the religion which his good mother had instilled into him. He continued to make voyages with his father for six years or thereabouts; deteriorating every day. He was, however, fond of reading, but he had no one to guide him, and unhappily, at the age of seventeen, the most critical period of a young man's mental life, Defoe's "Family Instructor" gave place to Lord Shaftesbury's "Characteristics,"—a per-

nicious book, full of dilettanti atheism, which is now forgotten, as Gray predicted it would be. The consequences of his study of a part of it were, that he became dreamy, idle, and deluded.

He was in his eighteenth year (1742) when his father left the sea, and determined to settle his son on shore also. In his present state of mind this was no easy matter. At last a merchant offered him employment for some years in Jamaica. He consented to go, and was to have started in a week, when his father sent him on business to the neighbourhood of Maidstone, in Kent. On his way he called on some distant relations of his mother's, named Catlett, who lived at Chatham. She had died at their house, but a coolness had sprung up between them and Mr. Newton on his second marriage, and John had never seen them since. They had two daughters, the eldest, Mary, a handsome girl of fourteen. With her he straightway fell in love, and all his plans for the future were overthrown.

He resolved not to be exiled from her to Jamaica, and waited about until he was sure that the ship in which he was to have sailed must be gone. He then returned home to his father, whom he found greatly incensed at his disobedience. Ere long, as no other pursuit offered, he went as a common sailor on board a ship trading to Venice. During this voyage he appears to have sunk almost to the level of his comrades; not without strange checks and warnings; but these he disregarded.

The most extraordinary of them was a dream, which he thus graphically narrated, years afterwards, in a letter to the Rev. Dr. Haweis:—

“The scene presented to my imagination was the harbour of Venice, where we had lately been. I thought it was night, and my watch upon the deck; and that, as I was walking to and fro by myself, a person came to me (I do not remember from whence), and brought me a ring, with an

express charge to keep it carefully, assuring me that while I preserved that ring I should be happy and successful, but if I lost or parted with it I must expect nothing but trouble and misery. I accepted the present and the terms willingly, not in the least doubting my own care to preserve it, and highly satisfied to have my happiness in my own keeping. I was engaged in these thoughts when a second person came to me, and, observing the ring on my finger, took occasion to ask me some questions about it. I readily told him its virtues, and his answer expressed a surprise at my weakness in expecting such effects from a ring. I think he reasoned with me for some time upon the impossibility of the thing, and at length urged me in direct terms to throw it away. At first I was shocked at the proposal; but his insinuations prevailed. I began to reason and doubt of the matter myself, and at last plucked it off my finger and dropped it over the ship's side into the water, which it had no sooner touched than I saw, the same instant, a terrible fire burst out from a range of mountains (a part of the Alps) which appeared at some distance behind the city of Venice. I saw the hills as distinctly as if awake, and they were all in flames. I perceived too late my folly; and my tempter, with an air of insult, informed me that all the mercy God had in reserve for me was comprised in that ring which I had wilfully thrown away. I understood that I must now go with him to the burning mountains, and that all the flames I saw were kindled on my account. I trembled, and was in a great agony, so that it was surprising I did not then awake; but my dream continued, and when I thought myself upon the point of a constrained departure, and stood self-condemned, without plea or hope, suddenly either a third person, or the same who brought the ring at first, came to me (I am not certain which), and demanded the cause of my grief. I told him the plain case, confessing that I had ruined myself wilfully and deserved no pity. He blamed my rashness, and asked if I should be wiser, supposing I had my ring again. I could hardly answer to this, for I thought it was gone beyond recall. I believe, indeed, I had not time to answer before I saw this unexpected friend go down under the water just in the spot where I had dropped it, and he soon returned bringing the ring with him. The moment he came on board, the flames in the mountains were extinguished, and my seducer left me. My fears were at an end, and with joy and gratitude I approached my kind deliverer to receive the ring again, but he refused to return it, and spoke to this effect:— 'If you should be entrusted with this ring again, you would very soon bring yourself into the same distress; you are not able to keep it, but I will keep it for you, and whenever it is needful produce it on your

behalf.' Upon this I awoke in a state of mind not to be described. I could hardly eat, or sleep, or transact my necessary business for two or three days; but the impression soon wore off, and in a little time I totally forgot it. A time came when I found myself in circumstances very nearly resembling those suggested by this extraordinary dream, when I stood helpless and hopeless on the brink of an awful eternity; and I doubt not but had the eyes of my mind been then opened, I should have seen my grand enemy who had seduced me wilfully to renounce and cast away my religious profession, and to involve myself in the most complicated crimes; I say I should probably have seen him pleased with my agonies, and waiting for permission to seize and bear away my soul to his place of torment. I should, perhaps, have seen likewise that Jesus, whom I had persecuted and defied, rebuking the adversary, challenging me for his own, as a brand plucked out of the fire, and saying, 'Deliver him from going down into the pit. I have found a ransom.'"

On his return he pursued the same conduct as before. He went to Chatham, and protracted his stay with Mary Catlett, until his father's designs were again thwarted, and he was almost tempted to disown him. He was for some time idle, and then his own reckless imprudence found him employment. These were the days of pressgangs. He insisted on wearing a seaman's check shirt, which attracted the notice of the lieutenant of a man-of-war. He was "pressed" and put on board a tender. The French fleets were threatening our coasts, and every available seaman was wanted, so his father could not obtain his release, and he was drafted into the *Harwich*, where his life was at first one of great hardship and misery.

Influence was, however, used with the captain, and he was made a midshipman. He might have done well now; but the unhappy lad would not use his advantages. Having obtained leave, while the ship was in the Downs, to go ashore for a day, he at once rode off to see Mary, and stayed with her for several days. When he returned, the captain was hardly prevailed on to excuse him, and he never

regained his favour. In his mental life he grew worse and worse. His chief companion was a deist, and he was easily persuaded to renounce all the hopes and comforts of the Gospel.

At last he took a final plunge. The fleet, of which the *Harwich* was one, sailed, but were shortly compelled by stress of weather to put into Plymouth. There he heard that his father was at Torbay. Thinking that he would be able to get him into the service of the African Company, he resolved to desert from that of His Majesty. He did so most disgracefully, namely, when on shore in command of a boat. He made the best of his way towards Torbay; but had not gone far when he was apprehended and brought back. He was sent on board his ship, put in irons, and then flogged. After this he was degraded from his rank; his late companions were forbidden to speak to him, and he was sent once more before the mast.

The miseries of the ensuing voyage may be imagined. He had shown himself haughty and vain as a petty officer, and therefore the common sailors, his companions, insulted him and rejoiced over his degradation. The superior officers, finding how incensed the captain was, soon ceased to screen him from ill-usage; and when he thought of Mary, he thought of her with despair.

The ship was at Madeira, when one morning as he was late in bed, an old companion, a midshipman, came down to him and bade him rise. He did not at once obey, so the midshipman cut down his hammock. He was greatly enraged, but dared not show his resentment; he dressed and went on deck. It so happened that two seamen from a Guinea merchant-ship had that morning volunteered on board the *Harwich*, and the captain was ordered to send two of his men in their place. Newton came on deck just in time to hear this. He asked to be one of them. His

request was granted, and in a few minutes he was on board the Guinea trader and bound for Sierra Leone.

The captain proved to be a friend of his father's, and would have been his friend, too, if he would have allowed him. But he would not. He seems to have become more ungovernably wicked on this voyage than ever, though he suppresses the details. And he turned the captain into open ridicule and lost his favour.

After trading some six months on the coast of Africa, the ship having a full cargo (of slaves, we presume) was about to sail for the West Indies. On this, Newton, fearing that when he got there he would be forced to re-enter the navy, obtained his discharge, and entered the service of a slave-dealer.

He remained with him about a year, suffering every sort of hardship in that pestilential climate, and sinking, morally and mentally, lower and lower in degradation. Ill-used by his master and black mistress, half-starved, ill, miserable, but yet still licentious and profane, he says that he had only one desire which was not shocking both to reason and religion—his love for the far distant Mary. His picture of the wretchedness he underwent is most graphic,—exposed for twenty, thirty, perhaps forty hours together in incessant rains, accompanied with strong gales of wind, having on nothing but a shirt, a pair of trousers, a cotton handkerchief instead of a cap, and a cotton cloth about two yards long; and at dead of night going, pensive and solitary, to wash his one shirt on the rocks, where he had afterwards to put it on wet that it might dry upon his back. He wrote once or twice to his father describing his misery and asking his assistance. That father he was never to see again.

At the end of the year he obtained his master's consent to live with another trader. This man treated him better,

but he did not amend. He was happier, but sunk so low, that he seemed likely to become what he describes significantly as a white man grown black. From this, however, he was saved.

Nearly two years had elapsed since he landed. He was about to start on a trading journey inland, only waiting for a few goods to make up an assortment, when one day his fellow-servant being on the beach saw a ship (an unusual sight in that particular place), and signalled to her to stand in, as they could trade. Most strangely, this ship belonged to the merchant who had formerly engaged to send Newton to Jamaica, and he (at old Newton's request) had instructed his captain to inquire after the young man at all trading stations on the coast, and bring him home. He had done so, and hearing that he was at a great distance from the usual ports, had given up all idea of reaching him. When he found he was so near, he determined to secure him and carry him off, which he did, after some trouble. It seems that the wayward and degraded young man would not have gone after all, but for his remembrance of Mary.

At last it pleased God to awaken him. On the homeward voyage they were overtaken by a fearful storm, in which the ship was nearly lost. He was utterly exhausted by his labours at the pumps, for she was wretchedly leaky; and he was put to the helm. Here he began to reflect. He thought of his former religious professions, the extraordinary events of his life, the calls, warnings, and deliverances he had met with, his licentiousness, his profane ridicule of the Scriptures. And he began once more to pray.

After a time of great fear and suspense the storm abated; and then they discovered, to their horror, that the violent motion of the ship had beaten their provision-casks to pieces! At a distance of more than three hundred miles from land, they

were without food, except a few salt fish: their sails were mostly blown away, and their ship was shattered and leaky.

Some days passed, when one morning they were awakened by a cry of "Land!" It seemed like a mountainous coast, about twenty miles off, very similar to the north-west extremity of Ireland, for which they were making. In their joy, they ate up all their little remaining stock of bread, and drank their last pint of brandy. They had hardly done so ere the sun rose, and showed that their land had been only clouds, and the same morning their wind died away, and there was a complete calm.

Starvation now stared them in the face. Half a salted cod was a day's subsistence for twelve persons. They were obliged to work continually at the pumps to keep the ship afloat, and the severe labour and scanty food threatened to put a speedy end to their sufferings—unless they fed on one another. Newton, perhaps, suffered more than all the rest. Remorse, and fear, and shame, were conflicting in his heart with newly-awakened hope,—and the captain continually reproached him with having brought this distress upon them by his wickedness, and said they could not hope to escape unless he was thrown overboard. The wind, however, sprang up again, and it remained in the right quarter, until—just as they were cooking their last ration—they reached Ireland. They had not been at anchor two hours before it came on to blow so violently that if the ship had been at sea she must inevitably have foundered.

While the ship refitted, he landed, and his newly-awakened sense of religious need was now so strong, that he went to church twice daily, and, on the first opportunity, took the sacrament. He wrote to his father, who had long given him up for lost. The letter reached him just as he was about to sail for Hudson's Bay, having been appointed Governor of York Fort, and he could not wait to see his

repentant son, whom he would fain have taken with him. But he did what he could for him. He went down to Chatham and consented to his marriage with Mary Catlett. He never returned to England, being drowned while bathing in the Bay.

Newton proceeded to Liverpool, where the friend who had engaged him when a youth to go to Jamaica, and whose ship had now brought him home from Africa, took him into his service, and he went out for him as mate of a slave-trader. He has not given many particulars of this voyage; but he does not seem to have thought that he was acting a criminal part in assisting in this barbarous traffic.

On his return from this voyage (1750) he was married to Mary Catlett. Seven months afterwards, he sailed on another slaving expedition. He was now captain of the vessel, and it only shows how blunt was the conscience of the country when a religious captain could allow himself to follow this horrible business.

He continued to pursue it till 1754. During his several voyages he made strenuous efforts to educate himself. He taught himself Latin under great disadvantages; he read many religious books; above all, he diligently studied the Scriptures. He was, notwithstanding, about to start once more on a slave trip, when he was suddenly seized (November 1754) with a fit, and prevented from going. His infamous pursuit had not enriched him, and he was glad to obtain a situation as tide-waiter in Liverpool.

This office he held for some years. His religious convictions grew daily stronger and stronger, the more he reflected upon his past life; and in 1758 he began to think seriously of becoming a minister of the Gospel. He preached occasionally in Liverpool and elsewhere; he published a volume of sermons, and when he had finally made up his mind, he solicited ordination from Dr. Chester, archbishop of York. He had not, however, passed through the usual course, and

though it was evident that he was a fit man, and though he had a title to a curacy, he was refused.

He waited some time, and then (1764) he was offered the curacy of Olney on the recommendation of Lord Dartmouth, who had the living in his gift. Thanks to the powerful influence of this nobleman (to whom the first twenty-six Letters of "Cardiphonia" were addressed), Dr. Green, bishop of Lincoln, was induced to admit him as a candidate, and afterwards ordained him.

The Vicar of Olney was a pluralist, and lived elsewhere. On John Newton, therefore, devolved all the labour of the parish. He did vicar's work on curate's pay. He received 60*l.* per annum, a stipend much less than his salary as a tide-waiter had been. But he did not complain; and though offered a better cure, would not change. He longed to do some good in the world after having done so much harm in it; to tell sinners of the Saviour whom even he had found. This seemed a fit place, and he stayed in it. With such an income, however, it was impossible for him to relieve the distress with which he was continually brought into contact. Like Muller of Bristol he prayed, and help was sent him. His Letters to Dr. Haweis, containing the Narrative of his early life, having been published, he had sent a copy to Mr. Thornton of Clapham, a man distinguished for piety and philanthropy. He soon after paid Mr. Newton a visit at Olney, and allowed him 200*l.* a-year to help the poor and needy.

John Newton's curacy of Olney was, of course, chiefly remarkable for his friendship with William Cowper. Into the many vexed questions which have arisen out of this, we do not here enter. We do not consider that either by temperament or education he was a suitable companion for the refined and shrinking poet; but that they loved each other reciprocally, and that Newton was the kindest of friends to

the poor distracted recluse, we do not believe any honest inquirer into the matter would doubt.

In 1779, he removed to London, having been presented by Mr. Thornton to the rectory of the united parishes of St. Mary Woolnoth and St. Mary Woolchurch Haw, Lombard Street. There he laboured with remarkable and visible success for the rest of his prolonged career.

He had been settled here somewhat more than ten years, when he was called on to encounter the greatest sorrow he ever knew. His wife had always had a good constitution, but the fit which had terminated his seafaring life in 1754 had, as it were, changed her; she never wholly recovered the fright she then experienced. Some time afterwards she had accidentally received a blow on her left breast, which had then caused her some pain, and afterwards rose to a tumour. But he thought it had been healed. In 1788, unknown to her husband, she consulted a surgeon, who told her plainly that he could do nothing for her. It proved to be a cancer, which at last carried her off, Dec. 15, 1790.

Of his grief on this bereavement some faint idea may be gathered from our recollection of his early, long, and steadfast affection to her,* an affection which time only matured. But he knew well that he had no reason to sorrow as those must who have no hope; and, with a resolution which was

* "Being with him at the house of a lady at Blackheath," says Mr. Cecil, "we stood at a window which had a prospect of Shooters' Hill. 'Ah,' said Mr. Newton, 'I remember the many journeys I took from London to ascend the top of that hill in order to look towards the part in which Mrs. Newton then lived: not that I could see the spot itself, after travelling several miles, for she lived far beyond what I could see when on the hill, but it gratified me even to look towards the spot; and this I did always once, and sometimes twice a-week.' 'Why,' said I, 'this is more like one of the vagaries of romance than of real life.' 'True,' replied he; 'but real life has extravagances that would not be admitted in a well-written romance; they would be said to be out of nature.'"

characteristic of him, he not only did not refrain from preaching during the most critical time of her illness, but he even preached on the very day of her decease, and three times while she lay dead in his house.

In Oct. 1791, he wrote to some friends in the country, still thinking of *her*:—

“The sun shines bright upon you this morning (for it is a fine day), but I cannot see it, the houses hide it from me; but I have light from it. It is thus with my soul. I seldom have much sunshine, but light I trust I have from the Sun of Righteousness, by which I see my way, and have an imperfect glance of the end to which it leads. Well, such a glance is worth all this poor world can bestow. The redeemed before the throne; look how they shine!—hark how they sing! They were not always as they are now; they were once like us, sorrowing, suffering, sinning; but He has washed them from their sins in His own blood, and wiped away their tears with his own hands. Amongst them are some who were once dear to us, with whom we have shared in pleasure, and sympathised in pain. There, I trust, is my dearest. I cannot describe my feelings last night when I looked upon the bed in which she languished so long; but it was a comfort to think she is not here now. I hear no moans, I see no great distress; she is gone—she is risen, and I hope ere long to follow her.”

In 1796, he writes,—

“Blessed be God I go on not uncomfortably, though my wound is as fresh as at the first day. The Lord is good. I still have much to be thankful for. I can still relish my comforts and friends, but I have little tie to the world now but my ministry. I am the Lord’s, and am willing to live his appointed time. I am like a labourer in harvest, who does not wish to leave the field till he has finished his day’s work, yet who looks now and then at the sun, and is glad to see the approach of evening, that he may rest.”

He preached almost to the last. In 1806, when he was eighty-one, Mr. Cecil counselled him to stop. “What!” he exclaimed, “shall the old African blasphemer stop while he can speak?” He would not stop. He continued to discourse to his crowded congregations long after his sight had grown so dim that he could not read his text.

But at last his summons came. Gradually, painlessly, and with his faculties about him, he passed away on the 21st Dec. 1807.

From the time when he first thought of becoming a minister, till he could not see to guide a pen, he was an indefatigable correspondent: and few men have had more of their correspondence published, or deserving of publication, than he.

In speaking of his characteristics as a letter-writer, we have to notice mainly his intense earnestness. He never forgot that he had been raised from being a servant of slaves to be a minister of Jesus. The whole of his extraordinary and most masculine energies were devoted to the spread of Gospel truth. This oneness of object, while in some respects it makes his Letters valuable, in others diminishes their interest. They are often affectionate addresses, rather than vivid, various, and life-reflecting letters. But he could be witty and graphic. Many of his letters to Mr. Bull ("My dear Taureau") abound in playfulness, while his letters to Dr. Haweis are as graphic as anything in Scott.

His best books, as an author, are letters, which he republished; and if he had left no Olney Hymns, no Sermons, and no Memoirs, his "Authentic Narrative," and his unrivalled "Cardiphonia," would suffice to account for the affection and veneration in which his memory is and ever must be held by all Christians.

C. M. C.

THE SHIPWRECK OF ST. PAUL.

The view of St. Luke's narrative adopted in the following pages is taken from an admirable treatise on the "Voyage and Shipwreck of St. Paul," by Mr. Smith, of Jordan Hill. He fully exposes the old fallacy of the "impossible seamanship" displayed in the management of the vessel, especially during the gale, and satisfactorily explains many discrepancies as originating in the non-nautical minds of our translators.

It should be borne in mind that the summer Etesiaë, or trade-winds of these seas, according to authorities reaching from Aristotle down to modern "Sailing Directions for the Mediterranean," come from the north-west. Slowly working to windward while these prevailed, the ship crept along the coast of Asia Minor, and at last dropt down from Cnidus to the eastern extremity of Crete, and, "hardly passing" the headland of Salmone, was at length forced to lie-to in Fair Havens.

Here the scene of the first Canto opens on the morning of the day when the change of wind induced the ill-fated attempt to gain the more commodious harbour of Phenice. The latter place is identified by Mr. Smith with the modern Sutro, a port lying west and a little north of Fair Havens, in the hollow sweep of coast beyond Cape Matala.

CANTO I.

THE autumn sun had crossed the line
With downward march through Libra's sign,
Where day and night in even scales
Hang poised, till heavy night prevails.
Still steady blew the Etesian breeze
North-west across the Adrian seas ;
On every island's upper shore
Dashed the long waves with loud uproar ;
On all the southern coasts the while,
Like silent lakes the smooth bays smile.

As when the Indian hunt has closed
Upon the forest deer,
In firm chivàlrous rank opposed
The circling stags appear,

While safe their living wall behind
 Crouch timid fawn and gentle hind ;—
 So, on the antlered front of Crete,
 With sounding charge the surges beat ;
 And so upon the weather-shore
 All safely anchored by the prore,
 Her boat behind her, in the bay,
 The Alexandrian vessel lay.
 But then, as now, the mariner
 Chafed at a dull repose,
 And rather loved the jovial stir
 When lashing gales oppose,
 And the ship, stooping to the lee,
 Cuts sideways through an angry sea.
 All irksome was the rest he found
 Within Fair Havens, weather-bound.

As the mirage-ship, hung on high,
 In ghostly stillness seems to lie
 On its ethereal ocean,
 While in the depths of air below
 A phantom double seems to grow ;
 So, without sound or motion,
 All, spirit-like, the vessel lay
 At dawn upon the Cretan bay ;
 And black upon the purple tide,
 Falls the broad shadow from her side,
 And thence the spars' long outlines stretch
 Dark-quivering tow'rs the silver beach.
 The lonely watch-lamp on the prow,
 By unseen hand extinguished now,—
 Its watery image, streaming far,
 Dies sudden as a falling star.

The purple depth of night grows pale and hollow ;
 From the slow-waking East upflows

Faint gleaming blue to fill the space ; now follow
Folds of the yellow veil which morning throws

O'er skies expectant of the rose ;

For see ! the strong rejoicing bridegroom comes,
And fires with glowing feet the mountain-domes !

Now, streaming down the airy steeps,

The spreading glory onward sweeps,

In each ravine and rocky hold

The purple mists are fired to gold.

Behind the wooded ridge mid-way

A moment rests the conquering day,

Then onward, like an army, till

Light overflows the convex hill.

A thousand banners wave beside

In richest tints by autumn dyed,

Far on the heights the runnels shine

In many a noiseless silver line,—

Near and more near their hastening feet

Slip through the woods with pausings sweet,—

As nearer yet the pageant gleams,

The marching music of the streams

Gaily onward comes ;

To their shrill voices deep responding,

Along the bay the sea resounding,

Sends a hollow roll of drums.

An arrow's flight from off the shore,

The anchored vessel rides secure,

And, as in sunshine thus she lies,

Quaint were her form to modern eyes.

Some queenly sea-bird seems her hull,

Light on the wave, and round and full.

Her curling prore, like wild-swan's neck,

Bends back towards the rising deck ;

Then, arching forwards, bends again

With graceful head towards the main.

And where you think the stern to view,
 There high the prumna rises too,
 Hollowed with carvings rare,
 With snowy feathers broad dispread,
 That ruffle out high over head,
 Wrought out in sculpture fair.
 Below, the groovèd pedals dip,*
 And guide, like sea-birds' feet, the ship;
 But while thus motionless she rides,
 Are braced against her swelling sides.

Fore of the vessel's centre, stands
 The mainmast, hooped with iron bands,
 From which rude shrouds depend;
 Above, the ponderous main-yard swings,
 Two bound in one with clasping rings,
 The membrane of the giant-wings
 That spread from end to end.
 The raking foremast stretches far
 Beyond the prow its slenderer spar,
 Where hangs the artemōn; †
 Capstan and cables, too, are there,
 And tackle quaint, and streamers fair,

* The *πηδαλια*, or rudders of ancient ships, were broad, short oars working at either side the stern. The "rudder-bands" referred to in Acts, xxvii. 40, were ropes which drew up the pedals and braced them against the sides of the vessel when she lay at anchor, or in port. "Loosing the rudder-bands" was thus the corresponding phrase to our "shipping the rudder," and was a necessary precursor to the attempt to guide the ship into the "certain creek with a shore."

† This word *ἀρτιμων* seems to have been very vaguely appreciated and variously translated by Greek scholars. Some understand by it a *pulley*, others a *vane*, and our translation of the N. T. gives it as the *mainsail*, thereby attributing a very gratuitous imprudence to the master of the ship in Acts, xxvii. 40. If, as Mr. Smith has almost demonstrated, he hoisted not the mainsail, but the *foresail*, to the wind, the case is quite altered.

As still on ancient medals rare
 To curious eyes are shown.
 Long had her idle sails been furled,
 While still south-east the vane uncurled ;
 But now the moon has filled her horn,
 And toward the north the streamers turn.

While thus the dawn to daylight grew,
 And soft and fair the south-wind blew,
 A fresh impatience fired the crew.
 Now on the vessel's prow were seen
 Quick-flashing arms the rails between,
 The soldiers mingled with the crowd,
 And loud complaints grew yet more loud.
 Julius, the captain of the guard,
 Who held in anxious watch and ward
 A band of prisoners, lately come
 From Cesarea, bound for Rome,
 Pacing the after-deck apart,
 Thus questioned with his doubting heart :—

“By all the gods ! ’t is hard to say
 Which scale of Fate has dipped to-day ;
 Whether to dare the open tide,
 Or in these cursed Fair Havens ride.
 While still perverse, the north-west wind
 Kept us ashore, the gods were kind ;
 Then the most headstrong felt perforce
 ’T were certain death to hold our course ;
 But now the treacherous south comes on,*
 And all their vulgar fears are flown.

* That the south wind deserves the epithet *treacherous*, appears from the following passage on which Captain J. Stewart, R.N., writing on the Archipelago, observes :—“ It is always safe to anchor under the lee of an island with a northerly wind, as it dies away gradually ; but it would be

Slow to remember or forecast,
 Blind to the future and the past,
 Their clumsy instincts still require
 To burn before they shun the fire.
 Methinks the tales that circle round
 Of this inhospitable ground,
 How crews that strove to winter here,
 Nigh starved ere the returning year,
 When April smoothed the swelling deep,
 Had scarcely strength to work the ship.
 So far the city from the shore,
 And all the lands between so poor ;
 And how this haven, only fair
 In its fair-sounding name,
 Proves to all those the proof who dare
 The emptiness of fame.
 And then how bright Phenice's smile,
 Close sheltered by her curving isle,*
 That, stretched across the harbour's mouth,
 Lies like a shield to north and south,
 Leaving a channel deep and wide,
 'Twixt point and shore on either side,
 Where ships with canvass swelling free
 May enter from the open sea ;

extremely dangerous with southerly winds, as they almost invariably shift to a violent northerly wind." This fact serves also to show what good reason the master and crew had for their reluctance to remain on the southern side of Crete now that it was no longer a weather shore with a north-west wind, but a lee shore with a south wind. We may suppose that the Fair Havens were better sheltered to the north-west than to the north. It was in fact a choice of evils, and the divine message by Paul was needed to point out the greatest of the two.

* *Phenice*, or the modern Lutro, looks towards the east, that is, in the direction in which the "south-west and north-west" look. An island lies in front of the harbour, which accounts for the double naming of the points, applying to the two entrances.

And while the wintry wind and rain
Howl over all the Adrian main,
Like sleeping swans may rock serene,
The island and the town between.
Methinks it needs no oracle
The meaning of this choice to tell.
How idle sailors crave, 't is known,
The licence of a sea-port town.
Island and harbour are but names
For sparkling wines and laughing dames ;
But trust me, rosy hands in vain
 Shall shade the Siren eyes,
That from Phenice search the main
 For their expected prize,
Till on the dim horizon line
 When Spring and Eurus come,
Far to the south the white sails shine
 That waft us by to Rome.

“ Yet, even the master of the ship,
While true to me in hand and lip,
He well supports, by deed and word,
The honour of my Roman sword
 'Midst this unruly throng ;
Yet still he sides with them in heart,
And urges, when we speak apart,
 In phrase abrupt and strong,—
To catch the south-wind while we may,
And for Phenice steer our way.
Little he skills with reasoning nice
To analyse his brief advice ;
He strikes the balance with a word,
And solves the tangle with the sword ;
But in that stern and steady mind,
No vulgar motives lurk behind.

"I do but mock myself; the fear
 That still would keep me lingering here,
 In my mind's centre lies profound,
 Untouched by all this reasoning round.
 Still in its inmost depth is heard
 The echo of that warning word.*
 Clear and succinct, no twisted phrase,
 Fulfilled whate'er befall,
 But safely proved, ere many days,
 As truth or falsehood all:
 The oracles are left forlorn,†
 The augurs may be laughed to scorn,
 But not the words of Paul.
 No wonder many a year ago
 At the Ephesian gate,
 The adoring crowd, with pæans loud,
 Led up the steers in sacred state,
 With lowings meet, with garlands sweet,

* "Now when much time was spent, and when sailing was now dangerous, because the fast was already past" (the fast, or day of atonement, falling near the autumnal equinox, was regarded by the Jews as the close of summer, and therefore of safe sailing). "Paul admonished them, and said unto them, Sirs, I perceive that this voyage will be with hurt and much damage, not only of the lading and ship, but also of our lives."

+ Milton sanctions the belief that the prophetic power of the ancient oracles was not always a mere pretence, but that the false spirits passed away on the Advent of Christ. Who that has once read can need to be reminded of the mingled triumph and pathos of that exquisite stanza in the "Hymn to the Nativity:"—

"The lonely mountains o'er,
 And the resounding shore,
 A voice of weeping heard and loud lament;
 From haunted spring, and dale
 Edg'd with poplar pale,
 The parting genius is with sighing sent:
 With flower-inwoven tresses torn
 The nymphs in twilight shade of tangled thickets mourn."

And fain would sacrifice have done

Before this Hermes' feet.

But with a sacred horror burning,

The altars in the dust o'erturning,

Through the indignant throngs he ran,

And loud proclaimed himself a man.

The gods speak truth, else such a lie

Were god-like in humility."

Ere Julius reach'd the gallery fair

That from the stern hung light in air,

All this, in dark confusion blent,

Through his vex'd spirit came and went.

Now, leaning o'er the clear profound,

He hears the drifting tide,

That with a measured, gurgling sound,

Flaps on the vessel's side.

Each after each the ripples slip

Within the shadow of the ship,

Then, eddying round by stern and prore,

Escape in sunshine to the shore.

So from Truth's ocean, vast and bright,

Spread out before God's throne,

Some outmost ripples, tipped with light,

Towards his soul flow on ;

So glide within the heathen gloom,

Awhile by darkness overcome.

No time for musing o'er the seas :—

Each moment now the freshening breeze

Tosses the waves upon the shore,

With louder and yet louder roar ;

Fierce-hunted round the jutting rocks,

Each moment now, the trembling flocks

Of fleecy breakers farther sweep

Within the creek, where lies the ship.

He shouted loud the master's name :—
With surly look the master came,
Muttering, " Then let thy words be few ;
'T were wisest not to leave the crew
Thus to themselves, a present hand
Is needed now to hold command :
Say in a word, then, are we still
To obey this Jewish oracle ?"
Anger and shame flushed Julius' brow
At this reproach, " And who art thou,
Who, to his face, in open light,
Darest to taunt a Roman knight ?
Did I not know thy heart is true,
My words should be as sharp as few.
But I forbear. Mark what I say !
Without another hour's delay,
Let all our swinging anchors weigh.
If this foreboding prophecy
Dwell on my soul, 't is nought to thee :
Suffice it, that I trust our fate,
The guards, the prisoners, crew, and freight,
In thy sole hands, my trusty mate."

The master, with a shame-faced brow,
Turned back, and hastened to the prow.
Few words he spake ; but, at the sound,
A sudden life spread all around ;
On every brow, the sullen look
To clear and ready sunshine broke :
Dark groups dispersed ; the willing crew,
Each to his post like lightning flew.
Some, to a rudely chanted song,
The heavy cables heave along ;
Hand over hand they fling them back
In dripping coils upon the deck ;

Some nimbly climb the shrouds and run
Along the mainyard, one by one
The furlings of the sails unbrace,
And shake them lightly to their place.
Now loosed is either rudder-band,
The helmsmen at the pedals stand,
Their eyes upon the master's hand ;
 Now, at his signal grave,
The starboard pedal cuts the sea,
And presses back with motion free
 The strong elastic wave ;
And like some living, conscious thing,
That seaward flaps her sloping wing,
Round,—slowly round, begins to swing
 Ocean's bird-like daughter.
Long, joyful shouts, the south-wind bore,
The bluff rocks of the Cretan shore
Send back the enlivening sounds once more
 Across the listening water.

F. A. P.

LITERARY SOCIETIES.

AN ADDRESS TO AN ASSOCIATION OF YOUNG MEN.

THE history of some of these literary societies is the story of the early effort of many of the leading men of the past and present generation. Those of Edinburgh especially stand out in this respect. At the end of last century, they associated such men as Sir Walter Scott, William Clerk, Edmonstoune, Abercromby, Adam Fergusson, the Earl of Selkirk, Boyle; while later, clustering more particularly around Francis Jeffrey, was a circle that embraced Brougham, Horner, Sidney Smith, Kinnaird, Lansdowne, and many more.

Scott and Jeffrey have both left ample testimonies to their indebtedness to these societies. Scott's is more inferential, Jeffrey's direct.

Scott says,—

“ In the business of these societies I cannot boast of having made any great figure. I never was a good speaker, except upon some subject which strongly animated my feelings, and, as I was totally unaccustomed to composition, as well as to the art of generalising my ideas upon any subject, my literary essays were but very poor work. I never attempted them unless when compelled to do so by the regulations of the Society, and then I was like the lord of Castle Rackrent, who was obliged to cut down a tree to get a few faggots to boil the kettle; for the quantity of ponderous and miscellaneous knowledge which I really possessed on many subjects was not easily condensed, or brought to bear upon the object I wished particularly to become master of. Yet there occurred opportunities when this odd lumber of my brain, especially that which was connected with the recondite parts of history, did me, as Hamlet says, ‘ yeoman's service.’ My memory of events was like one of the larger old-fashioned stone cannons of the Turks,—very difficult to load well and discharge, but making a powerful effect when by good chance any object

did come within range of its shot. Such fortunate opportunities of exploding with effect maintained my literary character among my companions, with whom I soon met with great indulgence and regard."

Compare this confession of his own inaptness in debate and in essay-writing with the fluency and ease with which in after-life he conveyed to the world his sentiments on political and social affairs, and his unequalled stores of old-world lore, and behold the result of perseverance in a course which had its origin in the Literary and Speculative Societies of 1788 and 1791.

When Jeffrey joined the Speculative Society, Scott was of such standing in it as to occupy the post of secretary. He used to narrate, how that on the evening when he took his seat for the first time, Scott sat gravely in his official chair at the bottom of the table in a huge woollen nightcap, pleading, when the president took his seat, a bad toothach as his apology for coming into that worshipful assembly in such a "portentous machine."

The future editor of "The Edinburgh" read five papers to the Speculative Society, and took a zealous part in every discussion. "The Tuesday evenings—the night of meeting—were the most enthusiastic and valuable of his week. It is easy to suppose what sort of an evening it was to Jeffrey when he had to struggle in debate with Lansdowne, Brougham, Kinnaird, and Horner, who, with other worthy competitors, were all in the society at the same time."

Forty-three years afterwards, when presiding at its seventieth anniversary, Jeffrey thus recalled what he owed it:—

"For his own part," he said, "on looking back to that period when he had experience of this Society, he could hardly conceive anything in after-life more to be envied than the recollection of that first burst of intellect, when, free from scholastic restraint, and throwing off the thralldom of a somewhat servile docility, the mind first aspired to reason, and

to question nature for itself, and, half wondering at its own temerity, first ventured without a guide into the mazes of speculation, or tried its unaided flight into the regions of intellectual adventure, to revel uncontrolled through the bright and boundless realms of literature and science. True it was, that all these hopes were not realised; that those proud anticipations were often destined to be humbled; but still, could it be doubted they were blessings while they lasted, or that they tended to multiply the chances of their being one day realised? He was afraid he was detaining them, but he could not avoid stating what had been so long familiar to his own mind respecting institutions of this kind, which, he considered, under proper guidance, calculated to develop the seeds of generous emulation, to lay the foundation, and trace the outlines of that permanent and glorious triumph to be achieved in after-life."

This brings us to another part of our subject. For, to the advantages of procuring information and attaining facility in reproducing it, there is to be added this other, which some perhaps will deem the most important, namely, improvement in the art of eloquence and debate.

There are two ways of reproducing information—writing and speaking. The relative importance of these, it were difficult to determine. The man who writes occupies a field of far wider extent than that usually occupied by the man who speaks; but, again, the speaker wields a superior power, when the force of his eloquence rouses and carries with him the mass. Thus much we know, that very often the good speaker is an indifferent writer, and still oftener the good writer is a very bad speaker. Nor do we know anything more disappointing to an audience, and more calculated to lower the influence of a man, than to find that he who pleased and instructed, and even roused when handling his pen, is a cipher when required to address an assembly. Those examples of perfect eloquence which stirred the slumbering energies of Athens, and sent forth armies for her defence, might have demanded as ardent and as wide-spread praise as they have obtained had they been only brilliant essays; but they would not have stayed the progress.

of the invader. Mr. Pitt might have felt his soul boiling with just indignation at the accusations of the hoary Walpole ; but a letter to the morning paper of the day would have been overlooked as a piece of personality, or laughed over as a display of private malice. But when the flash of his withering sarcasm was circling around the head of his unprincipled accuser in the House of Commons, Pitt assumed a position from which he could bid defiance to every such attack for the future, and obtained for himself, by that one display, a power, the influence of which he retained throughout his whole career.

This power of speech is one of the accomplishments we aim at in our association. It ought to be the object of every member's ambition. We must study all the turnings and windings of debate—forcible delineations—rousing passages—quick retort—and finely-pointed sarcasm. We bring into our little arena all the feelings that stimulate in a wider field, -where the points at issue are the politics of states and the welfare of kingdoms. And why do we this? That we may be the better fitted, should we be ever called to do so, to enter such wider arena, and to occupy that loftier station to which our energies or our ambition may aspire.

Do we talk of what can never occur? Let the annals of such societies as the Edinburgh Speculative reply. How many men, who doubtless rose first at that board with beating hearts, and made their maiden speech in tremulous accents, yet lived, like Horner, to hold the House of Commons in rapt silence by the tones of their eloquence, like Lansdowne to entrance, and like Brougham, send a thrill of emotion through the more apathetic Lords! And how many men are there whose names are enshrined in the annals of science, and live in history, whose origin was in ruder and humbler ranks than ours! Why may not we

emulate them? Why may we not make our Society an *Alma Mater* worthy in after years of our retrospective love and esteem?

How is this to be achieved? Simply in one way,—by your exertions. We are addressing a small association; nevertheless, one whose collective talent may yet bulk not meanly in the world. Much of that talent meanwhile may be dormant. But the sparks which have from time to time blazed out, tell us that there is fire. It rests with you to fan the latent heat into flame. With you it lies to determine whether you will go forth and seize a high place and perform a noble destiny, or, buried in sloth, conventional folly, and idleness, remain the mere creatures of indolent pleasure and ignoble self-indulgence. This know, if you will emerge into usefulness and honour, you must be prepared to encounter severe labour and engage in active exertion. It is easy, half-slumbering, to fancy one's self great, and please ourselves with dreams of wide-spread usefulness. But this won't do. We must have "honest application and downright working;" for without these the most transcendent talents and the most brilliant genius will only serve first to dazzle, and then to destroy their unfortunate, because unworthy possessor.

Every one must set out with the conviction—the deep and stern conviction—that on all subjects he has much to learn. On this account he must labour, and he must make it his determination to sift every subject to the bottom. You may be clever and talented, and, like most clever, and some even talented people, you may fancy that you are well informed, and even *savans* in your way. Of this beware! Men of genius, we have seen it somewhere remarked, are usually born, like Minerva, in panoply complete. But they never on that account cease to learn. Schiller wrote his play of "The Robbers" at the age of nineteen, and Jean

Paul struggled in the traces of literature at a still earlier age. But Jean Paul never ceased to read and study, and strive after truth; and Schiller, night after night, in the solitude of a little garden-house which he had on the top of a hill near Jena, gave testimony to the indefatigability of his industry in learning new truths and discovering and communicating new beauties. Occupy the position of Newton. Feel in the joy of your greatest acquirements that you are like a child on the sea-shore, busied with a few trifling shells, while the Ocean of Truth ever invites your onward and upward explorations.

And now may we be permitted to say that it rests with the members, by their gentlemanly conduct, by their sustained perseverance, and by their active diligence, to make a character for themselves, and keep up that which this Society has already attained, so as to render its membership a desirable and an honourable distinction. And sure we are, that we only express the feelings of all the members when we say, that we shall all regard this Society as a nucleus of ever-increasing and more strongly-cementing association and friendship,—a friendship and an association calculated, and we trust destined, to produce benefit to the community among which we dwell, and to which, when years have terminated our period of activity, if God shall spare us till then, we shall look back with pleasurable emotions, reviving the recollection of our youthful emulations in the pursuit of knowledge, and our more manly contendings in the cause of truth and right, and recalling with delight the commencement of attachments and undertakings which are still a comfort in life's decline.

For we take it for granted that each member of this Society looks forward to a life of usefulness. We take it for granted that none of us purpose to live a life of selfishness on God's earth. We take it for granted that every

one feels that he has been placed in this sphere of labour, this world that is progressive, never standing still, for other purposes than merely vegetating. We take it for granted that each is satisfied that for him a work has been appointed, and that the aim and ultimate endeavour of each are to find out and to fulfil that appointment.

That destiny, that work, it is not ours to predict. It may be in humble spheres, or in positions of extended power and influence. But whatever it may be, or wherever it may lie, such a work exists for all; and if we may judge from the aspect of the times, our position, if we maintain long any position on the earth, will require more determination, more nerve to sustain it, than our fathers needed for theirs.

Be it ours to prepare for this future. Let our pursuits in connexion with this Society tend towards that preparation. So, should a period of social or moral revolution come, let us who have enjoyed the advantages of this Christian Literary Association, be found with fixed principles, consistent practice, and trained, and tried, and reliable powers, ever doing battle on the side of timely justice and eternal truth.

W. F.

FIERY METEORS AND SHOOTING STARS.

“WHENCE come these stones and metallic masses?” said we at the close of our previous article. In this one we shall notice the various hypotheses that have successively claimed the suffrages of the learned.

In ancient times these meteoric masses were denominated sun-stones, and were supposed to fall from that luminary; but as there was never any ground for this supposition, and as we now know that the King of Day is 96,000,000 of miles away from us, we need say no more about this hypothesis.

Leurery imagined that they were due to lightning tearing up the ground and converting soil into compact masses, but this fancy we may summarily dismiss.

Another theory was, that they had been projected from volcanoes on the earth, and being carried into regions where the earth's attraction was small, they had remained long in the upper atmosphere, and had travelled far before descending to the earth. To this there are several most serious objections, especially that the meteoric stones are of a totally different character to the lavas actually thrown out of volcanoes.

Some have supposed that these meteoric masses were formed in the atmosphere itself like hail; and they have made large use of the words electricity, magnetism, and diamagnetism. But there is this difference between the two, that hail is made of water, of which there is an abundant supply in the clouds, and the physical forces by which the water is formed into solid masses of a considerable size are well known; whereas the meteoric stones are composed of iron, silica, &c., which do not exist in the

atmosphere; and even if they did, we are absolutely unacquainted with any means by which they could be at once consolidated into masses of many pounds weight.

In quest of the origin of meteoric stones we have thus travelled from the earth to the atmosphere, but we find no possible source there: we must proceed farther on our adventurous search, and see whether in the extra-terrestrial spaces we can find something which shall account for these strange visitors: and, indeed, they seem very independent of our earth; they fall unceremoniously on every part of it alike, and appear quite indifferent to fair weather or foul, thunder-storms or bright sunshine.

Yet if they be actually extra-mundane, what a tale do they tell of the unity of creation! No element has been found in them which does not occur in the earth, and a third of our recognised elements have been detected there. The laws of chemical combination and of crystallisation, too, are the same; for the olivine of these masses, and the iron pyrites, are identical in composition and in form with terrestrial minerals; and yet there is something unearthly about them, too. Why that deficiency of oxygen which, though it admits of the oxidation of silicon or magnesium, has allowed the iron and nickel to remain in the metallic state? Verily, had they been formed in the atmosphere, that great storehouse of oxygen, this had never been the case; and then the phosphorus and sulphur are also unoxidised, while the mineral Schreibersite, so general in them, occurs not on the surface of our planet.

Yes, they are assuredly no children of the earth or of the air. But was Olbers right when, speculating on the great fall at Sienna, he threw out the idea that they might be fugitives from the moon? This lunar hypothesis has been supported by Laplace, and other distinguished philosophers, and still finds a powerful advocate in Professor Law-

rence Smith of Louisville. The idea is, that these masses may have been projected from lunar volcanoes ; that they flew into a part of space where the earth's attraction was greater than that of the moon, and thus they either revolve for a while around the larger sphere or fall at once upon its surface. An initial velocity of 8000 feet per second would be sufficient for this, and such a velocity is easily conceivable when the prodigious size of the moon's volcanoes is taken into account. At the time also of the prevalence of this theory, it was believed that some of these volcanoes were active, but now it is generally considered that the bright spots seen on the dark portion of the moon were only the sun's rays impinging on the summits of very high mountains. The moon, indeed, seems to be given up to death-like quiet.

Though this lunar theory may satisfy many of the requirements of the problem, there are some circumstances about the fall of these meteoric masses which it seems inadequate to explain,—the very oblique direction in which they almost always strike the earth, the extreme rapidity of their descent, and certain peculiarities of the fire-ball ; for we must not rest satisfied with observing only those fire-balls from which stones have been known to descend. Hundreds have been noticed, from which we have no record of projected matter having been found ; but there is nothing improbable in that ; if a fire-ball of no remarkable brilliancy shoot down towards us in broad daylight, it will be scarcely distinguishable from some errant wreath of cloud, and will attract no attention, while the stone descending will just at that time stand the best chance of being seen and secured. If, on the other hand, our fire-ball wend its way earthward during the night, it cannot fail to be remarked by any observer ; but the stone being dark, will not be seen in its fall.

Nor is the fact that the very large majority of fire-balls have been described without any notice of falling masses, any disproof of the theory that they are small phenomena of the same type as the fire-balls of Laigle or Weston. For let it be remembered, that a fiery meteor in the sky could scarcely escape notice from some parties over the large area from which it would be visible, while the stone would be more likely to fall into some sea, lake, or river, than upon dry land; and even supposing it reached terra firma, it might be on some uninhabited or rarely-traversed region, or in a wood. Or let us grant that it did fall within the precincts of men, unless actually observed to strike the earth, it might remain undiscovered or undetected. If it fell in a field, it would just make a sudden visit to the rabbits or moles in their subterranean abodes; if it fell into the streets of a city, it would be attributed to some mischievous fellow who had no fear of the police.

We believe, then, that these fire-balls, which are frequently observed, are intimately connected with meteoric stones. We doubt altogether their reputed size,—500, 1000, even 2600 feet in diameter,—believing that an incandescent body seen at a distance is most illusory in its apparent dimensions. Let us inquire a little farther about these fire-balls. Mr. Cameron of Belfast writes:—“On the evening of June 22 (1851), when in my parlour, I observed a large ball of a whitish red appearing north-west from where I was, and I think about one mile from me, and about half a mile from the surface of the earth; it seemed at first enveloped in a cloud or haze; but upon emerging it showed about the size of the full moon, travelling slowly from west, and taking an easterly direction. After having travelled about a hundred yards, it began to throw out small ball-like comets in every direction, and the balls had

a greater velocity than the main body, and preceded it for a short distance; and before each ball exploded it became scarlet red, and threw out small shocks of matter; and after the ball had travelled 400 or 500 yards, it then appeared to be totally exhausted, and, as it were, dissolved without showing any remnant of matter. After this, the whole length that the large ball travelled had the appearance as if the space were filled with a reddish white matter, and remained so for seven minutes, and then began to get disordered and irregular, and in three minutes got spread or flattened, and ultimately dispersed, apparently by contrary currents of air."

The following is from a lady:—"On the evening of Friday, March 19 (1847), A. and I left Albion Road, Holloway, about half-past eight. Not any stars were then visible; but when we were in Highbury Place, A. called my attention to what we thought a fire-balloon ascending slowly. It was in the west, a little inclining to the south. As it passed on slowly to the west, its intense brilliance convinced me that it was not an earthly thing. When it appeared to be over Hampstead (but as high in the heavens as the sun is at six o'clock in the evening when the days are longest), it shot forth several fiery coruscations, and whilst we were gazing it broke into an *intensely* radiant cloud. This cloud sailed on slowly, and we never took our eyes off it. At this time the stars were shining. When we were in the gravel-path opposite to Highbury Terrace, the cloud was rather higher in the heavens and more to the west. It cast a most brilliant light on the houses there, brighter than moonlight, and unlike any light I ever saw: it appeared of a blue tint on the bricks, but there was no blue light on the cloud itself. Suddenly over the radiant cloud appeared another cloud *still* more brilliant; but I now felt so awe-struck, that I cannot say precisely how long they hung one

over the other before the most wonderful sight happened. Perhaps they remained so for two or three minutes, when, from the upper cloud, a small fiery ball (about the size that the largest planets appear to the naked eye) dropped into the lower cloud, and was instantly absorbed. Soon after another similar ball dropped from the upper to the lower cloud; and then a ball, apparently four or five times the size of the two preceding, fell from one cloud to the other in the same wonderful way. Shortly after this both clouds disappeared, apparently absorbed in the heavens, though I did see a few particles of the brilliant clouds floating about for a minute or so."

Yet, what constitutes a fireball? How shall we discriminate between it and other luminous meteors, which we find described in any of the published lists, as "Half apparent diameter of Moon," or, perhaps, "About size of *Venus*," "Brighter than *a Lyrae*," or, "Like a star of the third magnitude?" Size, of course, tells us nothing, for even the Weston fiery cloud seen at a great distance would have appeared but as a speck of light; indeed, there is every reason to consider, as identical in character and origin, those fireballs which have showered hot stones upon the earth, those celestial fireworks which take their course in the upper sky and vanish, leaving a train of light behind them, and those "shooting stars," which suddenly appear among their more quiet brethren, run a short and rapid course, and disappear.

Many lists of these luminous meteors have been drawn out. Besides that of the British Association by Professor Baden Powell, from which the preceding narratives have been taken, there is that of Chasles, from A.D. 583 to A.D. 1123,—that of Chladni, continued first by Von Hoff, then by Kämtz, and latterly by George Von Boguslawski,—and those of Coulvier Gravier, Biot, and others whose names

may not be interesting. These lists are voluminous; but what do they teach us about these strange wanderers?

1st. That they frequently come in showers. Ancient historians tell us of "a rain of fire," "and of the stars falling from heaven as thick as hail," and in modern times such displays have not been rare. The most wonderful was seen on the night of the 12th of November, 1833, over the whole of North America, when an observer in Boston calculated that 300,000 fell during seven hours. The first appearance is described as that of a magnificent shower of sky-rockets, and the subsequent meteors were sometimes simple luminous lines, but at other times bodies of notable size darting across the sky, and occasionally also remaining in view for half an hour or more.

2d. That these showers are periodic. The most brilliant spectacles were seen for several consecutive years about the 12th of November. There is another period, about the 10th of August, which has been remarked in perhaps thirty different years. In 1784 and 1785 showers occurred on July 27th. What is also significant is, that no remarkable displays have been observed in recent times in January or February, and scarcely any during the spring months; yet in the eighth century, the great period for such fiery rain seems to have been in February.

3d. That these showers proceed from some common direction: thus, in the November phenomena, meteors proceeded usually from the constellation *Leo*. It has been noticed that this direction has frequently been the opposite of that in which the earth was moving; but stars are often seen to shoot on the same evening in every conceivable manner.

4th. That these luminous meteors are frequently very high above the earth. If two or more observers at different places notice the same meteor, and remark the stars which

it appears to traverse in its passage, it is a very simple matter to determine where it was. In this way, a fireball that was seen over England last December, was determined to be fifty miles high when it exploded; but the shooting stars have been observed at 90, 140, and even 460 miles above us.

5th. That the rapidity of their passage is very great. According to the independent observations of Brandes and Quetelet, it varies from ten to thirty-six miles per second, which is a speed analogous to that of the earth in her orbit, namely, nineteen miles per second. Wartmann, of Geneva, has deduced very different numbers from his observations. In fact, he assigns 550 miles above the surface of the earth as the *average* height of shooting stars, and 220 miles per second as their *average* speed. These numbers are astounding, and are certainly incompatible with the previous computations.

6th. The course of these meteors is generally downwards towards the earth, but sometimes they actually rise away from it; neither do they always travel in regular curves, but sometimes bend or make sharp turns in their passage.

From the annual periodicity of these showers, Chladni was led to throw out what has been designated the cosmical theory. It supposes that, beside the recognised planets of respectable dimensions, there are innumerable smaller bodies revolving round the sun, and that the earth occasionally crosses their paths, when, as they enter our atmosphere, they become luminous from the heat evolved by the violent compression of the air. If the attraction of the earth be sufficiently great, or if their direction necessitate it, they strike the earth, frequently suffering combustion, or splitting into fragments as they pass through the denser air. The theory supposes, also, that these pieces of planet-dust sometimes fly

round the sun in groups of considerable number, and that the orbit of one of these groups cuts that of the earth on November 12; that of another, on August 10, &c.

This cosmical theory offers a satisfactory explanation of the principal phenomena, yet it is attended with one or two difficulties. It has received not a little support recently from the discovery of so many new planets, most of them being little worlds not larger than an English county. We believe that the solar system does include these masses of iron and olivine, and that in their course round the central luminary, they frequently become ignited in our atmosphere, and sometimes impinge upon the earth.

We refrain, however, from any expression of opinion upon the conjectures that they are the fragments of a planet that once occupied the vacant place between *Mars* and *Jupiter*; or that they fill up the space near the sun in countless multitudes, thus producing the strange luminosity often seen at sunrise or sunset, called the zodiacal light; or that they are constantly wending their way to the great centre of the solar system, and by their ceaseless falling produce that heat and light which, transmitted to us, start a thousand actions among the inanimate masses or the animated beings of our Globe.

J. H. G.

NOTES ON NORWAY.

No. VIII.

A FARMER'S HOME. AFFECTION FOR HORSES. GRAZING ON THE HOUSE-TOPS. CHEAP POSTING. WATERING WITH THE FOOT. THE GLOMMEN. PERILS OF LOG-WALKING.

RESUMING our southward journey, we reached Nedby, literally meaning, *low-lying abodes*. It is prettily situated on the banks of the Glommen. In the neighbourhood of Nedby are the finest pines we saw in the country. We were here regaled with our first dish of cloudberry and cream, very agreeable, but yielding the palm to strawberries and cream of southern celebrity. At this point we parted company with our young Cantab friends, who returned to Hjerkin to prosecute their journey to Christianja by way of the famous Gulbrandsdalen, while we preferred the less-frequented route of the Glommen. We met again after some days' journey in Christianja.

For some time we skirted the base of the Tronfjeld, a massive round-browed mountain, whose sides are clothed with pine, and its bare summit crowned with snow-like reindeer moss. The ancient mountain looked like a giant whose stalwart frame was not impaired, though his locks had grown hoar with age.

After a long and gradual ascent, we reached what, among the Alps, would be termed a Col, from which we rapidly descended through a narrow gorge into the lovely valley of Österdalen (*Eastern dale*). In the evening, we reached Engen, our station for the night. It was, perhaps, the prettiest and pleasantest of all our stopping-places. A large part of the valley and of the mountain-range was the

property of our host, a plain, but courteous and intelligent man, who, of course, farmed his own lands. A pretty garden lay behind the house, well stocked with vegetables and the earlier fruits. The red currants were (July 29th) almost ripe. There was a pretty expanse of lawn-like grass, of a closeness and smoothness—though without roller or other such appliance—that the English nobleman might envy. Then followed the dark pine-wood overtopped by the bare mountain summits, hoary with reindeer moss. All this was well seen from an elevation near the houses, to which a tidy walk conducted. The pretty hamlet, with its Annexkirke, and the distant stretch of the beautiful valley, were well commanded from this point. We are thus particular in the description to give some idea of the home of a Norsk farmer. Internally, the house was faultlessly clean, the linen snowy, and the flad-bröd, butter, honey, and eggs unexceptionable.

A better-conditioned class of men than these peasant proprietors one would not desire to see. In the simple comforts of life they abound: for its luxuries they have no taste. They live in such harmony and good fellowship with their neighbours, as the simplicity of their habits and the extreme sparseness of the population would lead one to expect. Yet even into this comfortable class of persons, as we were somewhat sorry to find, the rage for emigration has penetrated. I had an interesting conversation, a few days previously, with Hans, one of our skydskarlars, who, though himself a peasant-proprietor, was on the eve of sailing for America with his family. He was just about to sell his snug little property, with the two horses, twelve cows, &c., which stocked it. I asked him, why he left so beautiful, and peaceful, and abundant a home? His answer was, that, though he had plenty of everything, he had to work hard at home; but he trusted to return and lay his bones in Gamlé

Norge. Alas! for the hope of sanguine emigrants, who expect to "get along" in the States or the colonies without working!

The attachment of the peasants to their horses is remarkable. The skydskarls are universally amiable and obliging, but they have a tender point. Touch your horse unnecessarily with the whip, or urge him to a speed a thought greater than the karl approves, and from that moment he is your foe. An example of this occurred on one occasion, when the occupant of the leading carriole, taking advantage of the spirit of his beautiful horse, allowed him to career at a dashing pace along the level highway. The karl grumbled, but the speed being still unchecked, the driver found himself suddenly collared in a somewhat unceremonious manner. The karl's feelings were wounded in the most susceptible point: he could stand anything but *that*. The tift, however, was soon over, and the matter compounded with a piece of tobacco, always an acceptable gift in Scandinavia, greatly to the satisfaction of those who from the rear had seen the storm burst. The fellows are in the right, and one admires them for the tenderness of their care for their steeds; but seated in a light carriole, drawn by a brisk pony, and with a stretch of road before you as straight as an arrow and as level as a bowling-green, the temptation is sometimes irresistible.

Near Engen we passed a house with a kind of gangway or path leading from the road to the top of it. This appeared to be intended for the ascent of sheep to feed on the grass which covered the top of the house. We halted and ascended to the roof to inspect the pasturage it afforded. It is quite common to see crops of grain on the flat or flattish roofs of houses in the interior.

Although the roads by which we were now travelling might be regarded, when compared with the parts of the

country we had visited in the north, as frequented, and although there was regular postal communication by them, yet we found at some of the stations that a dozen names or so comprised the list of travellers for the past year. The law requires all travellers to be registered in these *Dag-bogs*, or day-books. These books, too, supply the means of expressing satisfaction or dissatisfaction with the supply of horses and the behaviour of the skydskarls. The returns are regularly inspected by officers of the government. Only on one occasion had we to enter a strong complaint. On arriving at our station no horses were in attendance. The cause of this we found to be, that our forbud-messenger, for whose horse we had paid, had economically determined to perform the journey on foot. The consequence was, that he had arrived only an hour before ourselves. It was impossible for the horses to be caught and brought from the mountains much under three hours, the time allowed by law. The postmasters and servants are of course anxious for a favourable report in the *Dag-bog*: and this anxiety, conspiring with native honesty and amiability, secures a most efficient postal service. The rate of payment is as low as about three-halfpence per English mile.

It may interest some of our readers to notice, that in one valley we witnessed an exemplification of the Scripture phrase, "Thou waterest it with thy foot as a garden of herbs." In a potato-field, across the end of whose furrows a stream of water had been directed, each furrow was dammed up with earth, which the husbandman gently turned aside for a time with his foot, to allow the passage of the water. In some parts they are very dependent on irrigation for the fertility of the fields. The sun being perpetually above the horizon soon licks up the moisture of the earth: and we found, on our first arrival in the North, that they had been entirely without rain for seven or eight weeks.

In our journey through the interminable pine-forests of the interior, we were on the whole favoured with good weather. We had, indeed, two days of rain. One of them was a Sunday, when we were resting at any rate, and so not much incommoded by it. The other day we had a long journey to perform, and met our fate as well as patience and macintoshes enabled us. All attempts to exclude the descending cataracts that careered down our necks and deluged the seats being useless, we at last contented ourselves with boring holes in the bottoms of the carriages to diminish at least the depth of our foot-baths. From this enforced hydropathy, we were thankful to take refuge beneath the hospitable blankets of Vestgaard.

Frequently we walked on during the change of horses at the various stations, and if the air was sharp, we sometimes kindled a splendid fire of pine-branches, which at any point could be assembled in abundance in the course of five minutes. Our conductor Ulle, who accompanied us the whole way from Trondhjem to Christianja, was a most obliging fellow and a great favourite with us all. He was anxiously solicitous about the right ordering of the journey, the supply of horses, &c.; and besides this, was most attentive to our personal comforts, the cleaning of our boots, and all such matters. His home is in Trondhjem; he can be found through Consul Knüdtzen, and he will be delighted to do similar services for the gentle reader, should he ever undertake our northern journey.

Proceeding southward from Vestgaard, after a few days' severance, we rejoined the noble Glommen, the main artery of Norway. We followed its course to within a short distance of the capital. It is the largest river in the peninsula, rolling a vast volume of water along its shaded channel. There is something about it very impressive, almost solemnising. Day after day we travelled within sight or sound

of it, through interminable expanses of forest. Mile after mile, hour after hour, the noiseless wheels of our *vogns* rolled over the forest-path strewn with the decaying leaflets of the pine. There is no interruption to these grand and gloomy forests of dark pine, but where, on arriving at a station, you find yourself emerging into a small cleared space where corn and potatoes are cultivated. Again you dive into the dark forest, and on—on—on you travel beneath the same unchanging shade, wending a course among ant-hills to be numbered by the thousand, and pines by the million. And still you hear the dull murmur of the deep current, as it flows along in the solemn shade. There is a mingled gloom and grandeur in the scene. The boundless expanse of forest impresses and stills the spirit like the boundless expanse of ocean, while the old Glommen swells and stirs like the labouring heart of this sombre scene.

This noble river does not flow in vain. He bears on his bosom for hundreds of miles the timber which is the staple produce of the country. The logs in places where some obstruction interrupts their descent, are to be seen accumulated in huge rafts or piers, often extending over great part of the river, and awaiting the next flood to launch them again in their downward course: and where the river retires in bays, its surface is frequently scarcely discernible from the vast accumulation of floating timber. It is a fine sight to see the logs precipitated down the splendid rapids which occur not unfrequently in the river's course. In a country so vast in extent, and so sparse in population, but for this great liquid highway, it would be impossible to make one-tenth of this timber available. As it is, we passed magnificent trees of prostrate and rotting pine in places where either there was no stream to convey them to the Glommen, or where the streams were too rugged or confined to admit of their passage. The logs are all notched

with the private marks of the owners, and reach the coast with surprising certainty and safety, to be exported to England, France, and other countries, for railway-sleepers, &c.

In still parts, where the river winds, the accumulation of logs is such as to resemble a pavement from one bank to the other. The inexperienced traveller fancies he could cross the river on this floating-bridge. Reaching such a point, one of our party resolved to try how far he could proceed in this manner. All went pretty well so long as he was near the bank; but when he had got out some little way, the logs were not so closely packed. Standing on two logs not very close together, one foot resting on each, he was pondering the safest and best mode of making his next step. The logs, meantime, yielding to the pressure of his weight, began gradually to recede from one another, while the spectators on the river side beheld the growing difficulties of the adventurous navigator with most aggravating merriment. Each moment the *situation*, as our Gallic Allies would call it, became more critical. The unstable element offered no resistance to the retiring logs. The arch which spanned the intervening space became larger and larger. But the moment was at hand when human endurance could do no more. To be riven asunder like a cliff in a thunder-storm, or to be plunged into the watery embrace of Father Glommen:—such was the dilemma. The latter alternative was preferred, and the adventurer at length gained the shore with the spirit of enterprise considerably damped, and resolved for the future to keep the king's highway. The sun was fortunately clear and powerful, and a drive of two or three hours sufficed to restore him to his normal condition. We wish it were in our power to present our readers with a lively sketch that was made in commemoration of this feat.

Some of the rapids of the Glommen are very imposing.

On several occasions we were induced by their heavy, rushing noise to leave our carriages and visit them. One or two we were fortunate enough to see when the river was in flood. Huge piles of timber were heaped upon the island rocks. The free logs were hurried forward to the brink of the cataract, and then, with one wild plunge, buried in the boiling abyss, rising at length in calm water a long way below, where several men in punts were busily employed with boat-hooks, pushing off the entangled timber.

Elk, which have become extinct in so many countries, still frequent these forests and the banks of the Glommen, but are seldom visible. We had the good fortune to see one of these singular animals, which had been caught when very young by one of the peasant-proprietors, and which has grown up in a half-domesticated state. It is allowed to wander along the banks of the river. It was not till we had joined in a lengthened search for it, along with its courteous owner, that we discovered it by means of the bell which it wore round its neck. Though as yet only fourteen months old, it is of very lofty stature and most powerful build.

As we began to approach the capital, the population became more frequent, and the freshness of character which generally marks the inhabitants began to be somewhat impaired. There was not the same hearty recognition of any small favour conferred, nor the same hearty grasp of the hand when any payment was made,—a custom which is graceful and pleasing, and which springs at once from the cordiality and the independence of the people. The country became more open, the unvaried pine began to give place to oak and ash ; and everything bore the appearance rather of a southern country than of that land of mountain, and flood, and forest, among which all our previous ramblings had lain.

On the last day of our journey we passed through two tolls, the only ones we had seen in Norway. Worse still, we came in sight of the railway, then in process of formation between Christianja and the Mjösen V-and. It appeared almost ludicrously out of character with all we had seen of the country. During the last three stages the road was fearfully rough. The springs of one of the carriages broke, and the luggage was tossed and tumbled in a most unmerciful way. The badness of the road was, no doubt, aggravated by the heavy traffic in iron-rails and other materials for the railway. The scenery in the approach to Christianja is pretty and Trossach-like, totally dissimilar in character to the majestic and solemn scenery of the west. From the heights there are pleasing views of the Christianja Fjord.

R. H. L.

THE CAVE OF ADELSBERG.

WRITTEN AFTER A VISIT IN 1855.

THE wondrous cave of Adelsberg
Hath endless shapes for Fancy's woof;
Forests of banyan, tapestried halls,
Heraldic monsters, miles of Gothic roof,
Mysterious cells with crystal bars,
Fruit-gardens, tombs, a diamond throne,
Side chapels not yet worshipped in;
Shrines, and Madonnas sanctifying stone.

Thus the more wondrous human heart
Sees but itself where'er it moves;
Peoples the zodiac with signs,
Or crowds earth's caverns with its hates and loves.

But other mystic types are here,
And the heart makes them all its own ;
—Droppings, like softening rains from heaven,
Taking strange forms, and hardening into stone.

Hath life green hopes like feathery palms,
Their streamer-leaves flung high and wide,
Neighbour'd by gloomy cypress thoughts ?
Their emblems both are here, and side by side.
A river warm from outer day,
As if in haste to cleanse and cheer ;
But quickly gulfed in caves of night,
And monster-swarming ere it reappear :*

Floors paved with crystals crushed, which once
Might have claimed kindred with the sun :
And still cementing drops descend,
As if kind Nature stood to make them one.
Nor do these stalactitic tears
Descend in vain ; like seed from heaven,
Growing to pillared principles,
They prop the roof through which they first were given.
J. H. D.

* The eyeless and lizard-like *Proteus Anguinus*, of which a specimen was shown to me, is not a native of the cave river, the Poik, though a few Protei are kept there, but is brought from caverns a few miles distant.

REVIEW OF THE MONTH.

IN order to complete our narrative of current events, it is our pleasant task to record the conclusion of a peace with Russia. It was signed at Paris on the 30th of March — two years and two days having then elapsed since war was proclaimed. The Allies have secured their object; and perhaps the peace will be all the more permanent, that it has been achieved without inflicting on Russia any of those signal humiliations which leave in the vanquished no feeling except a longing for vengeance.

In the death of the Rev. Adolph Monod, French Protestantism has lost its brightest star. After a long illness he expired on the 6th of April. His “Lucille” and his sermons give a good idea of his elevated, refined, and sagacious intellect, and of his deeply experimental piety; but of a preacher so great as he, the best is gone when we have lost his living presence.

The following table gives the number of visitors to the British Museum during the last six years:—

1850	..	..	..	..	..	1,098,863
1851	..	..	..	..	..	2,527,216
1852	..	..	..	..	..	507,973
1853	..	..	..	..	..	661,113
1854	..	..	..	..	..	459,262
1855	..	..	..	..	..	334,089

It is not easy to account for this sad falling off. The attractions of the Museum have been increased by the addition of the Assyrian antiquities and large accessions in the Zoological department. But many of the most interesting curiosities are inaccessible to the public. Coins, autographs,

personal relics of illustrious men, can only be seen by the courtesy of the curators; and although no guardians of public property can show more alacrity and zeal in rendering their treasures accessible to intelligent visitors, they are still beyond the reach of the multitude. And when are lectures to be given in connexion with the various departments? At present the specimens are mute; and few can spell out for themselves the "sermons" latent in the "stones" of the Geological Gallery and the Egyptian Saloon.

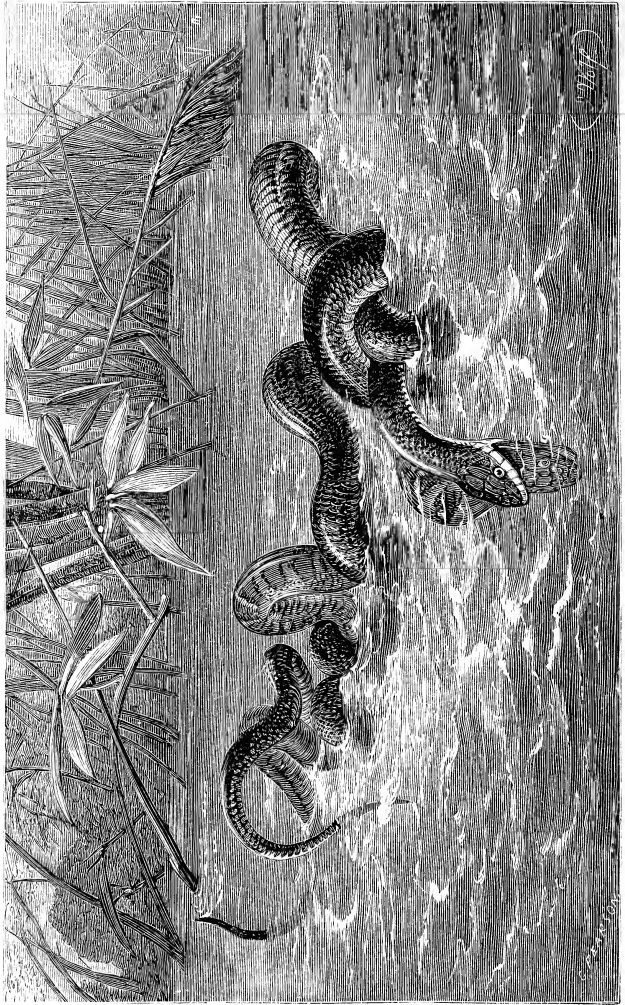
We are glad to find that the Scriptural Museum makes progress. The Earl of Chichester is President; and among the Vice-presidents are the Earl of Shaftesbury, Sir Culling Eardley, and Sir Henry Rawlinson. Already the collection at 22 Hart Street will repay a visit; and as there are few who do not possess some object or some book calculated to throw light on the Word of God, we submit if they could find a better use for it than to send it to a depôt, which, we trust, will soon be the great imperial magazine of all the materials requisite for Bible illustration.

Amongst many excellent books which have lately reached us, we would first of all notice "The Life of the Rev. Joseph Beaumont, M.D." It is the record, remarkably well written, of a career bright with benevolence and abounding in labours of usefulness; and it teaches two great lessons,—how natural defects may be overcome by good sense and energy, and how by a fervent spirit every fresh acquisition will be turned to the furtherance of the Gospel. "Fragments of the Great Diamond," by the Rev. J. Bolton, of Kilburn, are great lessons for young people, full of ingenuity and conveyed in a style of charming vivacity; and to those who desire "aids towards development" for the use of their children, we commend Mrs. Gatty's "Worlds not Realised,"—a very fresh and suggestive little volume. "Fernfoot, or Heart Portraits," is a series of vigorous photographs from

North-country faces, so strongly marked, that many will recognise the originals, and all will admit the artist's cleverness. The title, "John Sadleir, M.P., A History and a Warning," did not prepossess us; although it would be difficult to give a good reason for the pulpit ignoring the tragedies of the day any more than the sins of the time. But after reading Mr. Hill's publication, we render our hearty homage to the force of thought, the practical sagacity, and the Christian faithfulness by which it is distinguished. "The Hidden Life," is a short treatise, affectionate, Scriptural, and experimental, like the other works of its venerable author, Dr. Morgan of Belfast; and "Good, Better, Best," by Dr. Alexander of New York, is a book which every one should read who studies social problems, and who wishes to be of service to his fellow-creatures.

In "Tenby: a Sea-side Holiday," Mr. Gosse has made a delightful addition to that literature in which he has now no rival. And we are glad to find that it is his purpose to organise a class this season for the study of Marine Natural History, similar to one which assembled last year at Ilfracombe. This summer Tenby is the probable locality, and should any of our readers wish to combine instruction with amusement in their sea-side sojourn, we counsel them at once to communicate with Mr. Gosse. Under his pilotage they will bring back "treasures from the deep" sufficient to store the most capacious vivarium,—bright and beautiful creatures, which, even in a London drawing-room and a foggy November, will call up the vision of sunny skies, fresh breezes, and a sparkling ocean.





A Serpent Battle.

LIFE, IN ITS HIGHER FORMS.

No. III.

REPTILES.

LIKE the FISHES and the AMPHIBIANS, the animals of which we have now to speak are cold-blooded: that is, their power of producing heat in the process of breathing is so small, that their temperature scarcely rises above that of the medium, whether air or water, in which they reside. Like FISHES, they are mailed; their bodies are protected by a hard and dry skin, which takes the form of overlapping scales, or compact broad plates or shields, or, as in some of the Lizards, a combination of these two. They increase by eggs, which are laid singly, and are always enveloped in a calcareous covering, which, according to the greater or less ratio of the earthy element, is a parchment-like skin, or a hard and brittle shell. In the latter case, the eggs have a close resemblance to those of BIRDS. In several respects there is an advance in organisation over the AMPHIBIANS; the heart is composed of two auricles and one ventricle; the respiration is performed by means of lungs exclusively; and there is no metamorphosis in the Class, the animals presenting the perfect form even from the egg.

There is more diversity in form and structure among the animals that compose this Class than among those of any other of the great Vertebrate Division. Look at the ponderous Tortoise enclosed in an unyielding box, with an orifice in front and behind just large enough to allow him to poke out his head and limbs. Look at the grim Crocodile lurking in the river reeds, with his enormous jaws bristling with conical teeth, his body covered with bony shields, and

his lashing serrated tail. Look at the Chameleon running on the leafy twig, with his shagreen coat, his great inflated head, his long tongue shot out to capture a distant fly, and his slender tail-tip coiled round the branch to hold fast. And finally, look at the tortuous Snake as he lies basking on the sunny bank, in gleaming scales, darting out his forked tongue in play: see how he lies in twisted coils; and now mark how, footless and limbless as he is, he glides away on alarm, leaving only an undulating trail in the dust where he passed!

Surely all these various creatures are not formed on the same model! Surely there can be no community of structure here which can bind together into one group forms so remotely diverse! Yes, diverse as they are, they possess characters in common, which more than outweigh their differences, and the whole are united into a chain of many links, which by a beautiful gradation conduct us from one to the other.

Many of these animals are more or less noxious; and some of them are terribly fatal to other creatures and to man himself; hence, a certain amount of popular prejudice against the whole Class exists, and the innocent, which far outnumber the noxious, share the reputation, and are visited with the hatred and aversion due to their malific fellows. Yet there are points in their history, which make them not unworthy of our attention. The changeable lustre of many, especially of the tropical Lizards and Snakes; the elegance and grace of their movements; the provisions made for their defence in their formidable weapons; peculiarities in their organisation whereby they are fitted for their appointed spheres and habits;—these and many other details which our space forbids us even to enumerate here, render the study of *herpetology* no less attractive than any other branch of natural science.

The Serpent may be considered as the characteristic form of this Class of beings; at least our thoughts more spontaneously recur to the lithe and winding Snake, than to any other shape, when the word *Reptile* is pronounced, as indeed the idea of creeping* is most perfectly realised in the gliding movements of an animal absolutely without limbs.

There is something exceedingly interesting in this very action. The rapid gliding of a Snake is performed by means of the numerous ribs (which in the skeleton look like the feet of a Centipede), and the broad plates (*scuta*) which go across the belly. The action and the discovery of its nature are described by Sir Everard Home in the following words:—"When the Snake begins to put itself in motion, the ribs of the opposite sides are drawn apart from each other, and the small cartilages at the end of them are bent upon the upper surfaces of the abdominal scuta, on which the ends of the ribs rest; and as the ribs move in pairs, the scutum under each pair is carried along with it. This scutum, by its posterior edge, lays hold of the ground and becomes a fixed point from whence to set out anew. This motion is beautifully seen when a Snake is climbing over an angle to get upon a flat surface. When the animal is moving, it alters its shape from a circular or oval form to something approaching a triangle, of which the surface on the ground forms the base. The *Coluber* and *Boa* having large abdominal scuta, which may be considered as hoofs or shoes, are the best fitted for this kind of progressive motion. An observation of Sir Joseph Banks, during the exhibition of a *Coluber* of unusual size, first led to this discovery. While it was moving briskly along the carpet, he said he thought he saw the ribs come forward in succession,

* The words herpetology, reptile, serpent, creep, have all one etymology: ἑρπεω is their common parent.

like the feet of a caterpillar. This remark led me to examine the animal's motion with more accuracy, and on putting the hand under its belly, while the Snake was in the act of passing over the palm, the ends of the ribs were distinctly felt pressing upon the surface in regular succession, so as to leave no doubt of the ribs forming so many pairs of levers, by which the animal moves its body from place to place."

Many of the Serpents habitually live among the branches of trees, and most species can climb the smooth trunks with facility; not, however, by encircling the branch or bole in spiral coils, as artists who probably never saw a Snake in motion ridiculously represent them, but by a direct upward gliding, the body extended nearly in a straight line.

As all the Serpent tribes are carnivorous, and almost all feed on living active animals, often of much greater bulk than the diameter of their own mouths, while yet they invariably swallow their prey entire, it becomes a problem of interest how this is effected. They are fitted for their work by a peculiar mode of articulation in the bones of the head. All the bones of the skull are very loosely put together, but the jaws are remarkably expansible. In the first place, the lower jaws are much longer than the skull, commencing behind its base; secondly, they are not hinged to the upper jaw, but are suspended at the end of a pair of long slender bones, which are attached to the hind part of the skull by muscles and tendons so as to be very moveable; thirdly, the two branches of the lower jaw, which in higher animals are *soldered*, as it were, together, are in the Serpents simply bound by ligaments. The result of the whole arrangement is that the mouth is capable of a most enormous expansion.

Most of our readers are familiar with descriptions of the mode in which the great tropical Snakes,—the Boas of the

West, or the Pythons of the East,—take and gorge their prey. A Serpent, whose body at its largest part does not exceed the thickness of a footman's leg, and whose head is not wider than a lady's hand, will readily swallow a goat. We say "readily," because the process is regular and ordinary, but it is slow and tedious, and painful to read of, and much more to witness. We will not repeat the details here, but merely allude to a contrivance by which the function of breathing is allowed to proceed during the protracted interval of swallowing, when the whole throat of the Serpent is distended almost to bursting by the descending prey, and the whole head and jaws appear irremediably dislocated. These animals are furnished with peculiar muscles for bringing forward the *larynx*, or entrance to the windpipe, during the action of swallowing, as has been demonstrated by Mr. Joseph H. Green; and Mr. Broderip has observed that the larynx is at such a time protruded as much as a quarter of an inch beyond the edge of the dilated lower jaw.*

Most Serpents master their prey by open violence; and the large species of the tropics embrace it in repeated coils of their bodies, which are then contracted with great muscular force, so as to crush and compress their victim to death. But other kinds are furnished with a more securely fatal power, in the presence of two long, hooked, tubular teeth in the upper jaws. These teeth, or fangs, are open at each extremity, and the base communicates with a vesicle, which is a reservoir of powerful poison, secreted by glands spread over the cheeks. When a Rattlesnake or a Viper makes its attack, it commonly elevates the head and draws it somewhat back; then with lightning rapidity it strikes forward, piercing its enemy with the projecting fangs; at the same instant the poison-bag, which has been just filled by the secretion, poured forth under the excitement of rage,

* "Zool. Journal," ii.

is compressed by its proper muscles, and the deadly fluid is injected through the tubular tooth into the wound.

In the harmless Snakes (or rather those which are not poisonous), each of the upper and under jaws is set with a number of small, but very sharp teeth, pointing backwards; the palate is also armed with two similar rows, so that there are six lines of teeth in the mouth. Owing to the loose jointing of the bones before mentioned, the two sides of the head are capable of being moved to and fro separately, with a sort of see-sawing action. When the teeth have been struck into the victim, this alternate advance of the sides of the face begins, and as the backward inclination of the teeth allows the food only to move in one direction, it is gradually drawn by a constantly shifting of the hold on either side into the throat.

There is a South African Snake (*Deirodon*), the mouth of which is deprived of teeth, yet it is destined to feed on the eggs of birds. The apparent defect in this case has been pointed out by Professor Owen as a beautiful example of special contrivance. "If," observes that great physiologist, "the teeth had existed of the ordinary form and proportion in the maxillary and palatal regions, the egg would have been broken as soon as it was seized, and much of its nutritious contents would have escaped from the lipless mouth of the Snake in the act of deglutition; but owing to the almost edentulous state of the jaws, the egg glides along the expanded opening unbroken, and it is not until it has reached the gullet, and the closed mouth prevents any escape of the nutritious matter, that the shell is exposed to instruments adapted for its perforation. These instruments consist of the inferior spinous processes of the seven or eight posterior cervical vertebræ, the extremities of which are capped by a layer of hard cement, and penetrate the dorsal (upper) parietes of the œsophagus; they may be

readily seen even in very young subjects, and in the interior of that tube, in which their points are directed backwards. The shell being sawed open longitudinally by these *vertebral teeth*, the egg is crushed by the contractions of the gullet, and is carried to the stomach, where the shell is no doubt soon dissolved by the gastric juice.*

It might be expected that the ferocity of animals so exclusively carnivorous, so energetic, and so well furnished for rapine as Serpents, would sometimes direct their arms against each other. Perhaps our readers may not be displeased to see the report of a conflict of this sort, in which the prowess of the combatants, their equality of force, their perseverance, and their fury, are graphically described by a gentleman who declares himself to have been an eye-witness of the scene. Of course the story depends on the veracity of the writer ; but we may be permitted to observe that some details of the description, which a naturalist can appreciate, and which could scarcely have been invented, seem to indicate that the picture was drawn from the life.

The story is narrated by Mr. St. John in his "Letters of an American Farmer." After describing the size and strength of some hemp-plants, around which a wild vine had formed natural arbours, he thus proceeds:—"As I was one day sitting, solitary and pensive, in this primitive arbour, my attention was engaged by a strange sort of rustling noise at some paces distance. I looked all around without distinguishing anything, until I climbed up one of my great hemp-stalks; when, to my astonishment, I beheld two snakes of a considerable length, the one pursuing the other with great celerity, through a hemp-stubble field. The aggressor was of the black kind, six feet long; the fugitive was a Water Snake, nearly of equal dimensions. They soon met, and, in the fury of their first encounter, appeared in an in-

* "Odontography."

stant firmly twisted together ; and whilst their united tails beat the ground, they mutually tried, with open jaws, to lacerate each other. What a fell aspect did they present ! Their heads were compressed to a very small size ; their eyes flashed fire ; but, after this conflict had lasted about five minutes, the second found means to disengage itself from the first, and hurried towards the ditch. Its antagonist instantly assumed a new posture, and, half-creeping, half-erect, with a majestic mien, overtook and attacked the other again, which placed itself in a similar attitude, and prepared to resist. The scene was uncommon and beautiful ; for, thus opposed, they fought with their jaws, biting each other with the utmost rage ; but, notwithstanding this appearance of mutual courage and fury, the water-snake still seemed desirous of retreating towards the ditch, its natural element. This was no sooner perceived by the keen-eyed black one, than, twisting its tail twice round a stalk of hemp, and seizing its adversary by the throat, not by means of its jaws, but by twisting its own neck twice round that of the water-snake, he pulled it back from the ditch. To prevent a defeat, the latter took hold likewise of a stalk on the bank, and, by the acquisition of that point of resistance, became a match for his fierce antagonist. Strange was this to behold ; two great snakes strongly adhering to the ground, mutually fastened together by means of the writhings which lashed them to each other, and stretched at their full length ; they pulled, but pulled in vain ; and, in the moments of greatest exertion, that part of their bodies which was entwined seemed extremely small, while the rest appeared inflated, and now and then convulsed with strong undulations rapidly following each other. Their eyes appeared on fire, and ready to start out of their heads. At one time the conflict seemed decided ; the water-snake bent itself into great folds, and by that operation rendered the other more

than commonly outstretched ; the next minute the new struggles of the black one gained an unexpected superiority ; it acquired two great folds likewise, which necessarily extended the body of its adversary, in proportion as it had contracted its own. These efforts were alternate ; victory seemed doubtful, inclining sometimes to one side, sometimes to the other, until at last the stalk to which the black snake was fastened, suddenly gave way, and, in consequence of this accident, they both plunged into the ditch. The water did not extinguish their vindictive rage, for by their agitations I could still trace, though I could not distinguish, their attacks. They soon reappeared on the surface twisted together, as in their first onset : but the black snake seemed to retain its wonted superiority ; for its head was exactly fixed above that of the other, which it incessantly pressed down under the water, until its opponent was stifled, and sank. The victor no sooner perceived its enemy incapable of further resistance, than abandoning it to the current, it returned to the shore and disappeared.”

P. H. G.

THE BROKEN EMBANKMENT.

As was mentioned in a former paper,* in the Netherlands and some other countries, so flat is the beach and so shallow is the ocean, that a man may enclose a portion of the liquid expanse, and, by pumping off the water, may at once secure to himself a ready-made estate. Every man is born on the edge of such an ocean. Perhaps he has no patrimony, and, sure enough he is born into the world without knowledge. His fortune is all to make; but he has the means of making it. From the great waste he may reclaim as much as he pleases, and, through industry and the blessing of God devoutly sought, he may succeed in securing a goodly domain of intelligence, moral worth, and ascendancy over others.

It cannot, however, be disguised, that a territory formed in this fashion is liable to many hazards; and if the submerged birth-right says, "Take pains, and I will come to you," the surrounding ocean says, "Take care, or I will drown you." The great battle, in the first instance, is to wall off the space and pump out the brine; but it needs constant vigilance to preserve the acquisition. The surrounding deep is really higher than the solid land, and the dash of the waves and the flow of the current are constantly wearing and wasting the dykes and breakwaters; and, did the owner not assiduously repair the damage, the ocean would soon recover his own. So, to preserve the fruits of past effort, we have need of diligence. The scholar who does not keep up his learning soon loses it; and when you ask, What has become of it all? Where has it all gone, which, at the time, cost such trouble and expense? How is it that at forty he knows less of Latin and algebra than he learned at fourteen? The answer must be: "He did not

* "Excelsior," vol. v. p. 1.

revise. He took no pains to keep up his acquisitions, and so his knowledge is all engulfed—gone back to the great abyss of ignorance from which it was at first reclaimed.” And the trader, the servant, the clerk, who has made or inherited a little money, if he does not take care of it, will soon be as poor as ever. And the man who has made some friends—who, by his amiable qualities, or his obliging exertions, has attached others to his person—if he allow months or years to elapse without intercourse, and if he takes no pains to preserve what he once deemed so precious, will forfeit it all; or if he allows an umbrage to arise, or a misunderstanding to continue unexplained,—“the beginning of strife is as the letting out of water,” and soon angry controversy and bitter recriminations may tumultuate on the spot where the bower sacred to friendship blossomed before. And the man who has made some progress in well-doing—who has earned a character for sobriety, or honesty, or industry—this leak, is it not a little one? Yes, but it is a breach in the rampart, and if you do not stop it at once, you may be a beggar to-night, and may be glad to escape from the seething desolation in a boat which you are obliged to borrow. A little act of duplicity or dishonesty—an occasional absence from the house of prayer, or a slackening of private devotion—a few drops of drink too much, or a few minutes at your post too late, may be the neglected crevice at which a whole inundation of evil bursts in, with the shame and confusion and irretrievable disasters of a moral bankruptcy overwhelming the spiritual sluggard.

It is to the rupture of friendship that the proverb* immediately applies; and, in such a case, nothing can be more apposite than the metaphor. For, what are friends? They are a heritage of the heart—a little but choice estate which the owner has won for himself from the cold outside world

* Prov. xvii. 14.

—a little paradise recovered from the deep. But to retain, in its freshness and beauty this garden enclosed, you must retain the worth which first gained it, and the warmth which first made it blossom. And it is at once instructive and solemn to know the trivial occasions which have converted esteem into contempt, and replaced affection by bitterest enmity. As in the quarrels of nations, where a disputed boundary, the arrogance of a diplomatist, the unscrupulousness of some private trader smuggling goods or invading protected fisheries, has involved great countries in war, slain thousands of combatants, and desolated myriads of homes; so, in the relations of life, a cause seemingly contemptible has sundered chief friends and kindled feuds which were only quenched by being buried in the grave. And, therefore, those to whom friendship is a good and perfect gift do well to watch the beginnings of strife—the commencements of a possible estrangement. Not only will you leave off contention before it is meddled with; but you will be careful of the defences by which friendship is guarded. You will set a watch on your lips, and avoid, not merely the themes of angry controversy, but the sarcasm which wounds the sensitive, and the irony which perplexes the simple. And should it come to your knowledge that offence, whether just or unjust, has been given, you will lose no time, you will quit your unfinished business, and even lay down and leave before the altar your gift, in order to go your way and make sure your brother. And, not content with guarding accidents and healing incipient breaches, you will work still deeper; and by acts of considerate and forethoughtful kindness, by frequent and affectionate intercession, by cheerful courtesy, as well as the more costly or laborious demonstrations of a love unfeigned, you will strengthen the bulwarks and drive deeper the stakes which guard the sacred enclosure.

But any bad habit, if it be not promptly arrested, may end in the total destruction of character.

Hear the confession of one of the most exquisite writers who have ever graced English literature, or saddened the heart of piety :—

“Twelve years ago,” says Charles Lamb, “I had completed my six-and-twentieth year. I had lived from the period of leaving school to that time pretty much in solitude. My companions were chiefly books, or at most one or two living ones of my own book-loving and sober stamp. I rose early, went to bed betimes, and the faculties which God had given me, I have reason to think, did not rust in me unused.

“About that time I fell in with some companions of a different order. They were men of boisterous spirits, sitters up a-nights, disputants, drunken, yet seemed to have something noble about them. We dealt about the wit, or what passes for it after midnight, jovially. Of the quality called fancy I certainly possessed a larger share than my companions. Encouraged by their applause, I set up for a professed joker!

“My next more immediate companions were no drinkers, but one from professional habits, and another from a custom derived from his father, smoked tobacco. The devil could not have devised a more subtle trap to re-take a backsliding penitent. The transition from gulping down draughts of liquid fire to puffing out innocuous blasts of dry smoke, was so like cheating him. But he is too hard for us when we hope to commute. He beats us at barter; and when we think to set off a new failing against an old infirmity, 'tis odds but he puts the trick upon us of two for one. That (comparatively) white devil of tobacco brought with him in the end seven worse than himself.

“I have seen a print after Correggio, in which three female figures are ministering to a man who sits fast bound at the root of a tree. Sensuality is soothing him, Evil Habit is nailing him to a branch, and Repugnance at the same instant of time is applying a snake to his side. In his face is feeble delight, the recollection of past rather than perception of present pleasures, languid enjoyment of evil with utter imbecility to good, a Sybaritic effeminacy, a submission to bondage, the springs of the will gone down like a broken clock, the sin and the suffering co-instantaneous, or the latter forerunning the former, remorse preceding action—all this represented in one point of time.—When I saw this, I admired the wonderful skill of the painter. But when I went away, I wept, because I thought of my own condition.

“Of *that* there is no hope that it should ever change. The waters have gone over me. But out of the black depths, could I be heard, I would cry out to all those who have but set a foot in the perilous flood. *Could the youth, to whom the flavour of his first wine is delicious as the opening scenes of life, or the entering upon some newly-discovered paradise,* look into my desolation, and be made to understand what a dreary thing it is when a man shall feel himself going down a precipice with open eyes and a passive will,—to see his destruction, and have no power to stop it, and yet to feel it all the way emanating from himself; to perceive all goodness emptied out of him, and yet not to be able to forget a time when it was otherwise; to bear about the piteous spectacle of his own self-ruin;—could he see my fevered eye, feverish with last night’s drinking, and feverishly looking for this night’s repetition of the folly; could he feel the body of the death out of which I cry hourly with feebler and feebler outcry to be delivered—*it were enough to make him dash the sparkling beverage to the earth in all the pride of its mantling temptation; to make him clasp his teeth,—*

‘and not undo ’em

To suffer WET DAMNATION to run thro’ ’em.’

“Behold me then, in the robust period of life, reduced to imbecility and decay. Hear me count my gains, and the profits which I have derived from the midnight cup.

“Life itself, my waking life, has much of the confusion, the trouble, and obscure perplexity of an ill dream. In the daytime I stumble upon dark mountains.

“Business, which, though never particularly adapted to my nature, yet as something of necessity to be gone through, and therefore best undertaken with cheerfulness, I used to enter upon with some degree of alacrity, now wearies, affrights, perplexes me; I fancy all sorts of discouragements, and am ready to give up an occupation, which gives me bread, from a harassing conceit of incapacity. The slightest commission given me by a friend, or any small duty which I have to perform for myself, as giving orders to a tradesman, &c., haunts me as a labour impossible to be got through. So much the springs of action are broken.

“The same cowardice attends me in all my intercourse with mankind. I dare not promise that a friend’s honour, or his cause, would be safe in my keeping, if I were put to the expense of any manly resolution in defending it. So much the springs of moral action are deadened within me.”

Like what the British essayist describes so awfully, is

the course of many a sin. It comes in a white devil, but it soon darkens into a black one. It arrives like a fairy, through a crack in the door or a chink in the wall; but it soon expands into a giant, which crushes into a corner all the better inmates, and which the whole strength of the household is unable to expel. It begins a tiny stream, which it is almost amusing to observe as it rills over the embankment, and runs among the grass; but already the colossal hydra is mining the substructions, and, with a mighty heave, is ready to overthrow the rampart and let the roaring ruin enter.

Sometimes it is a slow and insidious process. Like the little stream of brine which soon converts into a putrid marsh the green pasture or the smiling garden, some evil habits come with little observation, but they soon turn "fat land to barrenness." You change a pious friend for a worldly acquaintance. You give up a strict or a fervent religious society, for one more lukewarm or fashionable. You quit the safe and sober path of industry and frugality for the faster route of a doubtful calling, or a speculative adventure. In the absorption of business or the fascination of a favourite amusement, you give up some of your good old habits,—your reading of good books, your frequenting of prayer-meetings, your visiting of the poor, your instructing of the young. And although the change is slow and silent, and does not startle your neighbour or yourself, it is none the less real. It is gradually secularising your spirit,—deadening it to God and the things divine; and, just as in a garden when it changes into a brackish quag, the fairest and sweetest flowers are the first to perish, whilst a few of the coarser and more common plants may linger to the last; although thrift and honesty, and some of the every-day virtues may still survive, tenderness of conscience and brotherly kindness, prayerfulness and love to God, and all the

beauties of an unworldly holiness, die away, and there is danger lest, drowned in cares of this life and swamped with earthly-mindedness, your soul subside into the state described by the prophet, "The miry places thereof, and the marshes thereof, shall not be healed; they shall be given to salt."

But there is another way of it. The breach may be the prelude to a sudden inburst,—the pioneer of an awful and overwhelming inundation.

As we said, character is a reprisal from the surrounding ungodliness. It is that measure of moral worth and Christian consistency which God enables any one to achieve in the midst of this present evil world. But so far as it is human it is weak; and in as far as it is goodness in the midst of evil, it is beset with peril. Around it rages a troubled sea that cannot rest; and, with the corroding industry of a current, "the course of this world" keeps burrowing and sapping it; whilst in moments of fierce temptation the prince of the power of the air heaps all his storms on the stressed and straining bulwark. And just as in lands where clay ramparts exclude the main, a leak may be disregarded for months; but at length there comes a fearful hurricane, and, as it piles the waters on the feeble dyke, the little runnel grows into a foaming spout, and the spout expands into the molten mud and tearing fury of a broad cascade; and with a groan the bulwark bursts, and the exulting ocean tumbles in: as amongst ships torn from their anchorage and tossing through the trees, you see the spinning-wheel and the empty cradle floated past, and the hoary grandsire and the helpless babe alike swept off on the gurgling billows, you perceive how criminal is negligence,—you pronounce a curse on carelessness.

Nor is this the emblem merely of the incompetent or heedless statesman, whose hardihood is the ruin of a realm.

It is not the picture of the great financier or giant speculator, whose feeble principle yielding to a prodigious pressure brings desolation on a hundred homes; but it is the image of that catastrophe which may await any one of us if conniving at a little sin we let it grow into a large one; if we allow the defences of virtue to be breached by any habitual transgression, till in some hour and power of darkness, iniquity come in like a flood and carry all before it. The emblem shadows forth the possible consummation of a temper wrathful and unrestrained, which, after scattering many a fire-brand and wounding many a feeling,—after scowling into gloom and apprehension what should have been the glad hours of childhood, and darting almost daily pangs into some tender bosom,—at last culminates in some frantic atrocity, and is sobered by seeing an Abel bleeding at its feet or blazing overhead the dwelling kindled by its reckless hand. It symbolises the natural history of intemperance and every form of sensuality, which, from small beginnings, advance and gather strength, till, as in the horrid instances where people have been carried off by hideous animals and held in captivity, the immortal nature is embruted, and the beast becomes the master of the man. It images the progress of many a prodigal where the beginning of evil was so small a thing as the robbing of an orchard; the obtaining a sum of money on a false pretence; the secret consorting with a companion against whom he had been charged and warned; a Sunday excursion; a clandestine visit to the theatre; a debt; a something which did not seem so dreadful at the moment, but which was destined to be the first step in the downward road, and which has now conducted to rags and reprobacy; to the convict garb or the felon's cell; to the life which wishes that it never had been born, and which is yet afraid to die.

Reader, find out your sin, or, be sure, your sin will find out you. Ascertain the weak point in your character, and

whatever it be,—a soft and consenting humour, a covetous or gain-grasping propensity,—a truth-concealing or truth-distorting cowardice,—a boastful or vain-glorious spirit,—sloth, selfishness, the indulgence of base appetite, be sure that, uncured and unconquered, that sin will be your ruin. At this moment you may fancy that you have it under control; but it will not be long till it convince you that *it*, and not *you*, are the master. And before tied and bound with its chain you are carried captive by Satan at his pleasure, implore of God, for the dear Saviour's sake, to pardon all its grievous guilt, and beg the aids of His Spirit—all-holy and almighty—to enable you to overcome it. Nor, at first, would it be misdirected industry, though you concentrated all your energies on this one endangered point,—though you made it the object of your all but exclusive watchfulness, the subject of your most importunate prayers. This particular sin is your weak point; and when storms of temptation come, when any unwonted urgency is brought to bear, it is here that too likely your character will break down and sweep away your prospects for either world.

At the same time see to the foundations. In the lands in question it sometimes happens that the dyke is green, and all that meets the eye looks firm and solid; but underneath low-water level, the worms have bored the piles, the rush of the current has washed away the supporting materials; and, whilst the owner and his neighbours congratulate themselves on the fresh turf and the fine facings of the masonry, to every one's amazement the mole gives way and crumbles down into the deep. So reputations, which have stood for many years, sometimes suddenly and mysteriously succumb. Addicted to no bad habit, as far as is known to other people,—of good report among them that are without,—of fair standing in the Church itself,—all of a sudden the rumour flies, “The dyke is broken!” “Such a one has denied the

faith, or done a deed which, when you hear it, will make your ears to tingle."

Now, as such an explosion is not an accident, as it seldom happens that a reputation gives way in which a hollowing process has not been advancing for some time before, it becomes him who standeth to take heed lest he fall. Let us see to it that the foundations are secure,—that the substructions are sound. Our creed was genuine once: let us see to it that we are as sincere and as fully persuaded now as when we first believed. God's eye was once around our path wherever we might go: let us take care lest we forget His presence now. "Without holiness no man shall see the Lord:" "Let him that nameth the name of Jesus depart from all iniquity," were once main piers in the foundation: let us see to it that now, when we are so much nearer the Great White Throne, the revelations of God's righteous judgment are not losing their solemnity. Friendship with Christ, and purity of heart and conduct, once were synonymes: let us see to it, lest, as the serpent beguiled Eve through his subtilty,—a tree of God's garden,—a truth of God's word,—be not made a plea for transgression,—a pretext for presumption, and because grace has abounded we take courage to sin. Prayer and its implied dependence on God were once as essential to our security as is its anchor to the ship,—as is its buttress to the ocean-bulwark: let us see to it, that the very answers to prayer be not perverted into an occasion of carnal confidence, and because we have been kept so long, we fancy that henceforward we can keep ourselves. Such presumption nothing can survive. Worm-eaten by unbelief, the supporting pillars will give way, and caved out by the corroding current of worldly-mindedness, the foundations will be swept to sea; and as, undermined and hollowed, the floods come and beat on that house, it will fall, and great will be the fall thereof.

BILDERDIJK.

MUCH of this world's mental wealth is locked up in limited or unattractive languages. Happy is the bard whose vernacular was Greek, Latin, or Italian, for these exquisite tongues compel their own cultivation, and will be essential to scholarship down to the end of time. And happy is the story-teller or the rhymester whose native speech is French, English, German; for it is withal the native speech of tens of millions, and even where it is not native, some knowledge of it has become a cosmopolitan necessity. Not so with some rugged or rarely-spoken languages. Every Portuguese will hold to it that there is no epic like the "Lusiad," and the subjects of the Czar recognise no poet like the Russian Byron; and if the Scottish Highlanders are not so fierce as once they were on behalf of Ossian, our brethren in the Principality will tell us that there is no uninspired psalmody to compare with the hymns of Williams of Pant-y-cwllŷn. But Camoens, Ossian, and Williams, are each monopolised by a handful of people, and few will do battle with the dragon of Slavie philology, in order to gather the golden apples of Puschkin.

So is it with the language of our Netherland neighbours. It contains a copious and very noble literature. But it is not an easy language, nor is it particularly inviting, and there are not many purposes for which it is indispensable. The consequence is that few Englishmen are acquainted with it, and there are, perhaps, not a dozen libraries in the kingdom which contain the works of Hoofdt, Vondel, Van der Palm, and the other classics of Holland.

Of these Dutch classics the latest was Bilderdijk. With his various writings on grammar, history, jurisprudence,

and poetry, extending to upwards of a hundred volumes, we can only profess a very partial acquaintance ; and for the few incidents in his life we are indebted to an eloquent sketch by his devoted admirer and legitimate successor, Dr. I. Da Costa,* himself one of the most remarkable combinations of genius, learning, and piety, in Europe.

William Bilderdijk was born at Amsterdam, September 7th, 1756, exactly a hundred years ago. His father was a physician, and he would have liked to rear his oldest son in his own profession, and did his best to initiate the boy in the mysteries of pharmacy. But he had an extreme aversion for everything like trade and business. Money-making was the only recognised pursuit among his bargain-driving, penny-turning neighbours ; and with an inborn loathing of such a life, he felt himself without a calling in this world. He was a melancholy, day-dreaming child. A kick on the foot, which he had received from a companion, and which for ten years necessitated a succession of surgical tortures, did not raise his spirits, and he seems to have had just religion enough to awaken his fears without warming his heart or quickening his activity.

“ A pensive child, I slank away
 A lonely spot to find ;
 And musing, sat the livelong day,
 The playmate of the wind.

And oh ! the pain, to future life
 Whene'er I turned my view,
 And felt that in its irksome strife
 I must some path pursue.

I loathed it all ; and as along
 Each track I forced my mind,
 I found no heart for one among
 The callings of mankind

* Overzicht van het Leven en de Werken van Mr. W. Bilderdijk. Nieuwe uitgave, 1854.

From Venus' bower no turtle bore
 A wreath with perfumed sighs,
 No myrtle shower'd soft slumbers o'er
 My dim and weary eyes.

No victor's palm waved o'er my head,
 No poet's laurel-spray ;
 For me no lily fragrance shed,
 No little bird its lay.

Dark grew the dunes, down died the blast,
 The ghostly air was dumb ;
 I gazed on desolation vast,
 And thought of wrath to come."

Through the Bible and Cats—a quaint old poet still popular in Holland—he first acquired a taste for reading, which he was enabled to cultivate extensively through the libraries of his father and his friends. Availing himself of these treasures, the invalid youth went through a very miscellaneous course of metaphysics, *belles lettres*, history, physiology, and everything which could nourish the mind of the latent poet, and at last began to compete for prizes offered by the literary unions of his native land. His success gave him a motive and a pursuit.

But poetry is not a profession, and eventually the doctor's son so far yielded to the ways of this world that he went to Leyden and attended the classes for Law. At the University, like our own Kirke White with Blackstone, he gave a noble example of diligence in abstruse and, perhaps, distasteful studies, and often sat up for two successive nights poring over the "Corpus Juris" and the prolix epitomes of Dutch legislation. In 1782, he passed as an advocate, and commenced in the courts of justice at the Hague a course of brilliant practice.

The revolution of 1795 was fatal to his further progress. A new oath was imposed, amongst the rest on legal prac-

titioners, renouncing the authority of the Stadtholder and recognising the so-called "rights of man." Bilderdijk not only refused the oath, but drew up a protest against it. The consequence was that he was ordered to quit the Hague within four-and-twenty hours, and Holland in eight days. As he received the intimation in the solitude of his study, he opened his Bible, and alighted on the words, "There hath no temptation taken you, but such as is common to man : but God is faithful, who will not suffer you to be tempted above that ye are able ; but will with the temptation also make a way to escape, that ye may be able to bear it." On the susceptible spirit of the outlawed patriot the word in season produced a great impression. So did a little trait of kindness, which one of his most pleasing poems commemorates. At Groningen he was waiting for a passport, and as one day he stood musing and pensive somewhere in the environs of the city, a young boy, struck with his sorrowful aspect, came up and offered him a seat. In the fulness of his heart Bilderdijk pronounced a fervent blessing on the boy, and a quarter of a century afterwards, through the clue of this little circumstance, they recognised each other. By that time the little boy was a distinguished preacher, and the dejected wanderer was the pride of the father-land. If such acts of frank and thoughtful kindness betoken no common child, neither are they common memories in which the grateful recollection lingers so long.

In the first place the exile repaired to England. At Hampton Court he found the expatriated Stadtholder, who granted a small pension to his faithful adherent. But in London, then swarming with refugees from France and other countries, he found no means of earning a subsistence. It is to be feared, however, that he was still haunted by his anti-commercial mania. Through the kindness of friends the opportunity was given him to proceed to Demerara,

where there was the prospect of an advantageous professional opening. Unfortunately, however, some one made the remark, "You'll soon make a fortune." The word was a thunder-bolt. It seemed to lower the barrister to the rank of a trader, and in a sublime fit of passion he threw up the appointment. Unfortunately, they are not poets alone who think it genteel to spend money and vulgar to make it; but it is curious that a pension from a prince should be deemed more honourable than the wages of industry.

The best thing which befell our author in London, was his marriage in 1796 to Catharina Wilhelmina Schweikhardt,—one of his fellow-countrywomen, and who was destined to achieve a poetical celebrity only second to his own.

From England he went to Brunswick. There, in the society of the devout geologist, De Luc, and other friends, his religious convictions deepened and intensified, and, like our own Cowper, Christianity henceforward became the life-essence of his poetry. The most exalted views of the Divine perfections, and of the grace and glory of the Saviour; triumphant contemplations on the Redeemer's coming reign, and on Israel's restoration; with a high and sometimes almost mournful strain of spiritual aspiration, form the staple of many noble effusions; and as his works found entrance into the land from which the author was excluded, they contributed not a little to the revival of piety as well as of the old Netherland patriotism.

With himself the home-sickness grew intense. Compared with the climate of Brunswick, the damp avenues of the Hague and the misty fields of Leyden were paradise, and if he could not revisit them, his German doctors feared that he must die. Accordingly, after a ten-years' absence, Batavia received again her banished bard, and all classes, from the sovereign and the learned societies downwards, vied with one another in the honours which were paid to

him. Soon after his arrival he was appointed Dutch tutor to the king, Napoleon's brother Louis,—an office which he could honourably accept, having previous to his return been released by the Stadtholder from his oath of allegiance. And after his restoration to his native soil, the first effort of his Muse was a tribute to the cause of charity. Soon after New Year's-day, 1807, a barge laden with gunpowder blew up in one of the canals of Leyden, and, besides shattering many houses into ruins, destroyed the lives of many citizens. National sympathy was awakened by the terrible calamity, and no one felt it more deeply than Bilderdijk, who had fixed his abode in this his favourite town. To the relief of the sufferers he dedicated a didactic poem, "The Scholar's Malady" ("De Ziekte der Geleerden"), and the profits of the publication added 1400 florins to the fund.

Louis was fond of Bilderdijk. He called him on one occasion "the glory of his kingdom," and he not only maintained with him a cordial friendship, expressed even in an epistolary correspondence, but he conferred on him the solid service of a maintenance from the treasury, in order that he might give himself entirely to those literary pursuits which yielded such pleasure to his fellow-citizens, and reflected such lustre on his country. But the trumpet of fame is not so loud as the bugle of battle. When the king's imperial brother visited Amsterdam in 1811, amongst other literary celebrities, Bilderdijk was presented to Napoleon. "Are you known in the republic of letters?" was the abrupt question of the autocrat. "I have done my best to be so," was the answer of the poet.

With all his sense of personal obligation to the amiable usurper, as a patriot of the olden school he rejoiced in the restoration of the House of Orange; and, as he passed the evening of his days in his quiet home at Leyden, he saw his

beloved Holland convalescent from its French fever and showing signs of its original sturdy constitution. Here, in the summer of 1825, he received what proved a protracted visit from Robert Southey. In the course of a tour the laureate was laid up with an inflamed foot at Leyden. Madame Bilderdijk had translated into Dutch Southey's "Roderick," and the poets had already corresponded. Hearing of the illness of the English traveller, the hospitable pair brought the invalid to their dwelling, and nursed him for three weeks with the most generous devotion. Writing to Bishop Jebb, Southey gives the following account of his friend:—

"Bilderdijk is one of those men whose openness of heart you perceive at first sight; and when I came to know them both, if I had sought the world over, it would not have been possible for me to have found two persons with whom I should have felt myself more entirely in unison, except, indeed, that my host stands up, like a true Hollander of the old stamp, for the Synod of Dort. He is above seventy years of age, and considering what he has gone through in mind and body, it is marvellous that he is alive. From infancy he has been an invalid. His pulse is always that of a feverish man. He has never slept more than four hours in the four-and-twenty, and wakes always unrefreshed and in a state of discomfort, as if sleep exhausted him more than the perpetual intellectual labour in which he is engaged. None of his countrymen have written so much, or so variously, or so well; this is admitted by his enemies; and he has for his enemies the whole body of Liberals and time-servers. His fortune was completely wrecked in the Revolution; and having been the most confidential and truest friend of the Stadtholder, he has received the usual reward of fidelity after a Restoration. . . . A small pension of about 140*l.* is all that he has; and a professorship, which

the king had promised, is withheld, lest the Liberals should be offended. . . . His wife is four-and-twenty years younger than himself, and in every respect worthy of him. I have never seen a woman who was more to be admired for everything womanly; no strangers would suppose that so unassuming a person was in high repute as a poetess. Bilderdijk's intellectual rank is at once indicated by his countenance; but he is equally high-minded and humble, in the best sense of those epithets; and both are so suited to each other, so resigned to their fortunes, so deeply and quietly religious, and therefore so contented, so thankful, and so happy, that it must be my own fault if I am not the better for having known them."

Bilderdijk died December 18th, 1831. We are not aware that any of his poems have been translated into English: nor has a collective edition appeared in his own country. A tinge of his youthful melancholy runs through most of them, and glances out in the very titles, such as "Autumnal Flowers," "One Foot in the Grave," "A Prospect of my Death." But they are noble compositions, full of beautiful imagery, elevated sentiment, and fervid inspiration. Some of them are wonderful achievements in their mastery of rhyme and metre. The following attempt to render one of his shorter pieces may possibly convey to the reader some notion of one or two of the author's characteristics:—

" PARENTAL SOLICITUDE.

As shiv'ring in our Northern May,
Th' exotic brood cowers bare and callow,
And from her plumes the parent swallow
Sheds summers gathered far away:

With flaming eye and flickering tongue,
As when the serpent scales her dwelling,
With beak and wing th' assault repelling,
The gentle dove defends her young:

So throbs my heart for thee, my child,
In foresight of life's various error,
And future storms with all their terror,
With yearnings fond and anguish wild.

Alas ! what boots foreboding woe ?—
With angel-plumes his scales disguising,
And sweetest scenes with death surprising,
Transfigured comes your crafty foe.

Even now as your first flight you take
Through buoyant air on bending pinion,
Exulting in the new dominion,
You fear no snake in bush or brake.

Yet watch, amidst this joyous clang ;—
With sharpened beak and talons gleaming,
On the tall crag the eagle dreaming,
Has waken'd in the cobra's fang.

Mistrust the elm-tree's massive shade,
Suspect where aspens shake and shiver ;
For where the coolest shadows quiver,
The hydra hides his oozy head.

The daisy-spangled turf beware ;
Fly where the vineyard's ripeness flushes ;
And, where the rose-tree sheds her blushes
On violet beds, fond youth, take care.

Of every golden trap be shy ;
Suspect a bait in earthly beauty ;
'Twill steal your soul from God and duty :
—'Tis treason all which tempts the eye.

No ! let your flight be upward given,
The serpent and his hiss defying,
A bird of Paradise still flying
To his evening rest in God's own heaven."

H. J.

THE POET OF POETS.

Αὐτοῦ ἔσμεν ποιήμα.

WE know there once was One on earth
Who penetrated all He saw,
To whom the lily had its worth,
And Nature bared her utmost law.
And when the mountain-side He trod,
The Universe before Him shone
Translucent in the smile of God,
Like young leaves in the morning sun ;—
Glory, which Phidias never won
To consecrate his Parthenon.

Nature her fine transmuting powers
Laid open to His piercing ken,
The life of insects and of flowers,
The lives and hearts and minds of men ;
Depths of the geologic past,
The mission of the youngest star :
No mind had ever grasp so vast,
No science ever dived so far.
All that our boldest guess sees dim
Lay clearly visible to Him.

Had He but uttered forth in song
The visions of His waking sight,
The thoughts that o'er his soul would throng
Alone upon the hills at night ;

What poet's loftiest ecstasies
Had stirred men with such rapturous awe
As would those living words of His,
Calm utterance of what he saw?
All earth had on those accents hung,
All ages with their echoes rung.

But He, we know, came not to speak;
He came to live, He came to die—
To heal the sick, the lost to seek,
And, dying, raise the fallen high.
And, save some few familiar words,
Uttered in calm and friendly tone,
Graved on the hearts of those who heard,
And written down when He was gone;
He left no written words behind,
No volume to record His mind.

But where those scattered seeds were flung,
Like raindrops on the parched green,
A living race of poets sprung,
Who dwelt amongst the things unseen;
Who loved all men, who sought the lost,
Yet saw beneath earth's masks and shrouds;
Whose life was one long sacrifice,
Death but the breaking in the clouds.
His volume as the world was broad,
His Poem was the Church of God.

E. C.

NOTES ON NORWAY.

No. IX.

CHRISTIANJA. BRANDY AND PAUPERS. ANTIQUITIES. IVY
IN A CONSERVATORY. THE SOUND. THE STRICKEN
CITY. HOME.

AT eight, on the evening of August 3d, we entered the capital, and found comfortable quarters in the spacious Hôtel du Nord. It had all the appearance and appliances of a Southern hotel, and formed a curious contrast to the homely farm-houses which for three weeks had furnished us with lodging. The supper-table groaned under a load of viands, which, after our recent habits, appeared of princely profusion. Rolls of delicate white bread were liberally scattered over the ample tables, excellent coffee and tea invited a choice, lobsters and shrimps shone in scarlet between dishes of almost every description, and linked their more substantial neighbours together in one harmonious and inviting chain. After two weeks of flad-bröd and gröd, it seemed the very extravagance of luxury.

With all this, however, it cannot be denied that a certain sense of oppression overtook us all on finding ourselves again suddenly ushered into the formalities and etiquettes of civilised and city life. There was a freedom and exhilaration about the breeze of the mountain and the wave, where the face of man was scarcely ever met, and which we might have fancied to be made but for our proper selves: and this was gone. We breathed the common air of a town to which thirty thousand men, women, and children, had as much title as ourselves. Eyes were upon us and ears were

open around us. Our feelings were pretty much like those of a certain family of American Indians, who were brought by a philanthropist to London to be civilised, and who again breathed freely only when their feet once more trode the free sod of the prairie.

We found that our yacht had cast anchor in the Fjord only two days before our arrival, having encountered at first calms, and then a severe storm in doubling the Nase. Next morning we found a large budget of letters and newspapers from England awaiting us, the first intelligence we had received from home. Welcome as this budget was, it is wonderful how well we got on without news of the *grand monde*, rather priding ourselves, perhaps, on the self-contained interest of our own *petit monde* and its proceedings.

Christianja is a handsome, regular, stone-built town. Its wooden houses having been burnt down in 1624, the new town was built of solid stone, so gaining in security what it lost in the picturesque. For this reason Christianja has less of interest for the traveller than either the ancient political or the modern commercial capital of Norway. None of the buildings have much pretension to ornament; the palace, university, castle, &c., owing more to their situation than their architecture. They are, however, substantial and suitable erections, well adapted for utility, and proclaiming the practical and common-sense genius of the people. Here, as throughout the country, the houses of the humbler, as well as of the merchant classes, preserve their character of amplitude and spaciousness, which they justly regard as a first element of comfort and even of civilisation. A Norwegian visitor of our country would be divided between astonishment at the princely palaces of the great and the suffocating cabins of the poor.

Another of the advantages common to Norway with other countries, whose primitive character is still preserved,

may here be mentioned. We refer to the support of the poor. They are scarcely at all a burden upon the community, receiving from the public funds only about one-tenth part, in proportion to the population, of what would be required in England. Aged, infirm, and useless people there are, no doubt, but these, for the most part, find shelter and food by the firesides of children, kinsfolk, or friends ; a system, indeed, which Providence planned to open, enlarge, and purify, the natural channels of the human charities, and for which civilisation has furnished a miserable substitute in a system which corrupts, and even chokes, the pores through which those charities should flow.

The love of strong drink is largely the cause of what poverty does exist. It was with great pleasure that we found ample reason to conclude that drunkenness has of late rapidly decreased in Norway. It cannot be doubted that legislative interference has in this case exerted a most salutary influence. Formerly every farmer had a license for making brandy for four thalers per annum—a merely nominal tax—so that every farmer was his own distiller : the quantities of good barley, rye, and potatoes, that were converted into brandy, almost surpass belief. The result among the dependants of every farm may be imagined. Some eight years ago, however, a law passed imposing a real, though still small, tax (five or six marks per gallon) on the manufacture of brandy, and further prohibiting its sale without a license. The consequence is an enormous diminution in the number of distillers, and a most conspicuous improvement in the drinking habits of the country. Somewhat prior to this period, teetotal societies sprang up in Norway, which, though now in a rather languishing state, probably contributed to this desirable result. We found many benevolent individuals taking a lively interest in this progressive amelioration. Among many of the rural

populations, especially of the remote North, we witnessed no signs of intoxication, and there, indeed, so far as our observation went, milk seemed to be more the favourite of the people than brandy.

The staple trade of Christianja is in timber. A good deal is done also, in a small way, in the sale of reindeer and other skins, and the tasteful carved-work of the peasantry, of which we furnished ourselves with specimens.

We were fortunate in being furnished with introductions to Professor Munch. He is the author of several books of Scandinavian history and antiquities, and of a map of Norway, which has attained all that is attainable in the way of minute accuracy and beauty. He is a man, whose profound erudition is only equalled by his profound modesty, and whose stores are poured forth in language so simple, and with an ease so graceful, that the listener forgets that it is from the most erudite man in the country that he is obtaining his information. The Museum of Natural History, which is stored with specimens of the flora and fauna of Scandinavia, was unfortunately closed, being under repair. But under the guidance of Professor M. we visited the Museum of Antiquities, and feasted on his inexhaustible stores of Scandinavian lore. It is a singular circumstance that the bronze period is lacking, or, at least, the relics of it have not been found in Norway. It seems abundantly proved by antiquities preserved in this Museum, as also in that of Copenhagen, that the ancient Scandinavians were of smaller build than the modern races of Europe. The space by which the flint knives were grasped of old is too small to admit an ordinary modern hand. Among other objects of interest we may notice a bridal dress of very antique style and profusely ornamented with gold and silver. In some districts there is only one bridal dress, which is kept for the general behoof. It is at the service of any simple

maiden who may require it, and who is thus arrayed for one day of her life in robes of a certain magnificence.

The Botanic Gardens derive their interest mainly from the admirable collection of Arctic plants, which the position of Christianja has enabled it to collect. Many of the plants, however, which we had seen in perfection in the Arctic Regions, were here of dwindled proportions and faded hues. The only ivy, so far as I recollect, that we met with in Norway, was here, and under protection of a green-house. On the other hand, they had some vines growing unprotected on the walls, and the grapes were already (August 5) well formed.

We were much pleased with what we saw of domestic life in Christianja. One's idea of *home* is realised there, as I suppose it is in no other European capital beyond the bounds of Scandinavia and of the British Isles. I must confess, however, that I received a less favourable impression of the simplicity and heartiness of the religion of Christianja, than of some of the remote valleys with whose inhabitants we became acquainted. We did not spend a Sabbath there, but could gather that its observance fell short of that in other parts of the country.

The pressure of time obliged me to take leave of my travelling companions, who were to prosecute their homeward journey in the yacht. Embarking in a well-appointed steamer I enjoyed a pleasant sail down the pretty Fjord, which affords a remarkable contrast to the grandeur of the western Fjords. It was Sunday morning when we cast anchor off Gottenburgh, and hoisted the green flag to indicate that we came from an infected port. Cholera had just appeared in Christianja: the same outbreak which, a month afterwards, numbered among its victims our countryman Bradshaw, whose name is so familiar to all railway travellers. After the passengers had been taken to the little island on which they were to perform quarantine, not

a boat came near us, though we lay there six or seven hours, nor were any of us permitted to set foot on shore. It was a dreary Sabbath spent under the shadow of the green flag. We heard no sermon but that which our circumstances seemed to proclaim to us, isolated as we were from our fellows and looked upon as unclean; viz., that we have need to be purified in the blood which cleanseth from all sin, before we can hope to set foot on the shores of that land, into which "there shall in nowise enter anything that defileth, neither whatsoever worketh abomination or maketh a lie, but they which are written in the Lamb's book of life."

We sailed rapidly down the Skaggerrack, and Sambo the steward had orders to awaken me at five next morning, when I expected we should be entering the Sound. Sambo was a Negro from the Danish colonies, and had his share of the good-natured vivacity of his race. Long before the appointed time, I was aroused by a somewhat unceremonious shaking. "Get up, Massa! get up." "Is it five, Sambo?" "No, but so lubbly; Massa muss come see." Hastily dressing myself, I was preparing to issue from my cabin, when I met Sambo hurrying to me again. Relieved to see that I was ready, he exclaimed, "O yes! dat's it. Dust de berry moment; dust lubbly. Massa, see, Danish Sambo know how for speak English." Sambo was certainly right. We were just entering the Sound in the brightness of one of the most charming of mornings. The Sound is only three miles wide, so that we commanded a beautiful view of the rich, but level corn-fields of Sweden to the left, and of the wooded and undulating slopes of Denmark to the right. The Sound was literally crowded with sail; every vessel that passes through it being obliged to cast anchor off Elsinour, for the payment of the dues which the authorities claim as an immemorial privilege. The sight was one of exceeding beauty, as we threaded our way through the crowding sails, and were moored to the wharf of Elsinour.

The steamer, in ordinary circumstances, proceeds to Copenhagen ; but owing to the fearful prevalence of cholera there at that time, it ventured no farther than Elsinour. We were obliged, therefore, to change steamers, and had two hours' delay in Elsinour, which enabled us to visit the beautiful Castle of Kronborg, and ascend to its summit. The view from this point was extensive and striking, as the eye ranged along the Sound with its countless vessels, or wandered across it to Helsinborg, and the rich plains of Sweden, or strayed over the wooded and corn-clad slopes of Zealand, with its frequent villages dotted along the coast. The scene formed a striking contrast to the rugged cliffs, and beachless seas, and long-withdrawing Fjords of Norway, from which we had just come.

By seven o'clock we were under way again for Copenhagen. We called at all the villages along the coast to pick up passengers. As boatful after boatful was taken on board, a deepening gloom seemed to gather round us. The passengers consisted chiefly of Copenhagen merchants, who had fled from the infected city with their families, but whose presence was required by the calls of business. Most of them wore crape round their hats, and other badges of mourning. They gathered themselves together in silent groups. Men only raised their eyes from the sea to look wistfully into one another's faces, or uneasily towards the desolated city we were approaching. Their markets and their merchandise seemed to have lost their interest for these silent men of the Merchants' Haven, for such is the meaning of their city's name in Danish, *Kiöbnhavn*. One could not help feeling how soon and how easily God can make all that most occupies and interests us on earth a mere shadow compared with the intense realities of a near eternity. The towering spires of the city, when they appeared rising majestically from the sea, awakened no joy among the passen-

gers. We soon found ourselves traversing the silent streets of the stricken city, on our way to the Police-office, where our passports had to be *viséed*. The officials looked at us with surprise, and told us that they had had light work lately, as for weeks past strangers had scarcely been seen in Copenhagen.

Under the guidance of an intelligent Dane, whose acquaintance I had made in the boat, I turned my steps to the Frue Kirke, which is adorned with statues by Thorwaldsen. We then visited the Thorwaldsen Museum, a large building filled exclusively with the works of the immortal sculptor. We dwelt with peculiar interest on the unfinished bust of Luther, with which he was engaged when he suddenly expired at a good old-age. The number of his works is such as to impress one with an idea of the unceasing activity of his prolific chisel. The exterior of the building is adorned with reliefs representing the arrival from Rome of Thorwaldsen, of his works, and of his marble blocks,—events on which the Danes look with profound interest. Thorwaldsen was himself a native of Denmark, though his father was an Icelander. A considerable part of his life was spent in the studios of Rome.

We drove through the exterior parts of the royal Christiansborg palace, at the door of which a neat and simple carriage was waiting for the King.

My friend then conducted me to a vast store of the biscuit-porcelain ware, for which the city is famous, and where I procured some pieces beautifully modelled after Thorwaldsen's choicest works. We next visited the Exchange; but, like every other part of the city, it was deserted. Wherever we went, we found that one mournful idea filled every mind. So deep and dark was the gloom that sat upon all faces, one could have fancied that a wide-spreading pall had been stretched over all the city. Few were to be seen

in the streets, and those few moved noiselessly and shrinkingly along, as if afraid to be stopped or touched by their fellows. One street seemed quite deserted; its windows were all open, infected beds were lying along the sides of the street, and here and there a woman was engaged in scouring or whitewashing the deserted chambers. We heard a heavy roll behind us; it was the dead-cart, with several rude coffins, but partially covered by a grey coarse cloth. Four thousand persons had died up to that time, and it was said that 40,000 had fled the city. No such mortality had been known in Copenhagen since 1711, when the plague desolated the city. It was no time to tarry unnecessarily there; and with two companions whom I had joined, and who were obliged like myself in hastening homeward to visit the infected city, I set sail from it the same afternoon, thankful that the scourge was beginning to abate, and at the same time wondering that we, — that any man, should ever allow anything to take precedence of preparation for the unseen world which may be so near us. “Therefore be ye also ready, for in such an hour as ye think not the Son of man cometh.”

Our steamer, the Slesvig, was a fine Glasgow-built boat, which quickly cleared the harbour. The view of Copenhagen, as we receded, was very fine. We gradually *dipped* it till only the spires were visible rising out of the water. The evening sail was pleasant past the Møen, and other islands, with their chalk-cliffs and wooded summits. Next morning at daybreak we were steaming into the beautiful harbour of Kiel, and were soon rattling in the train across the peninsula, passing innumerable cranes, with their formal nests on the tops of the cottages in the marshes. At Altona we took leave of Scandinavia, and from Hamburg made an easy passage to Old England.

R. H. L.

ENGLISH CLASSICS.

ALL are familiar with,—all constantly use the terms and epithets, “Classic, classics, classical.” We know how and in what circumstances to apply the designations, but perhaps have never stayed to define the terms, and to mark the exact limits of their significance. And this the more, that in our country the epithet Classic has a technical and special reference as applied to the literatures of ancient Greece and Rome.

By the term *classic* we indicate acknowledged and undisputed excellence. We do not, for example, term a history or a poem classical till some time has elapsed since its publication,—till it has run the gauntlet of the critics, and passed the ordeal of sober and matured taste,—and not till all the factitious and temporary associations connected with its production, such as the personal merits and popularity of the author, or the momentary interest of the subject treated, have been softened and modified by the lapse of time. For example, popular as is now Macaulay’s “History of England,” great as has been its success, we cannot strictly call it classical,—we cannot yet place it among English classics, because we are not, by the nature of the case, the judges in the matter. We may sanguinely predict for Macaulay enrolment and acknowledgment by future generations of Englishmen among the list of English classics. We may be confident that, when judged by its own merit as an historical authority and romantic narrative, his History will be estimated equally highly as now by us, prejudiced as we are in Macaulay’s favour,—by our knowledge of him as a contemporary, by our admiration of him as a poet, a reviewer, an orator, and a statesman. We may be confident that his

narrative of the Battles of Sedgemoor and the Boyne, and his picturesque description of the reception of the hero of his prose epic, William of Orange, in London, will be read with as much interest by Englishmen a hundred years after this, as by us, who have perhaps seen his noble eye flashing, as, on the platform of a literary institution or in the House of Commons itself, he expatiated in his genial field of letters, or in the no less appropriate domain of statecraft, reverting to the noble and safe traditions of the Revolution, guiding by wise precedent the course of reform and legislation. But that still remains to be settled by future generations. We as yet, except by anticipation, have no right to term Macaulay an English classic.

To vary the illustration;—we have no right to term Tennyson—the prince of our poets—a classic. Time tries all, and nothing more than poetry. Nothing is more varied, and varied again, than the standard of poetic taste. Who now is delighted by the conceits of Dekker and Dr. Donne, once the choice food of the fantastic English mind of the James and Charles I. era? Where now are the admirers of the sonnets, epilogues, epithalamia, and eclogues indited by “persons of quality” in the era of the last Stuarts and Anne? Who now ever thinks of exhuming Hayley and the Della Cruscans? We may sanguinely predict that Tennyson will be universally recognised as a classic. We may personally, and for our individual selves, believe that his fame and popularity will increase as generations rise with tastes specially tutored to his style. We may with certainty maintain that his “Queen of the May” and the “Miller’s Daughter” will stand in the same place in the hearts of future Englishmen as the old ballad of the “Nut-Brown Maid,” Goldsmith’s “Hermit of Warkworth,” “The Cottar’s Saturday Night,” “The Miller of Dee,” and “We are Seven.” We may maintain the lasting fame of “Locksley

Hall" and the "Lotos Eaters;" we may be confident that, so long as there continue to be saddened souls or reflective minds, "In Memoriam" will be prized and valued: but, contemporaries as we are of Tennyson, and conscious of the wondrous variations of poetic taste, we cannot, by the necessity of the case, as yet assert that Alfred Tennyson is a classic writer.

What is meant by these illustrations is, that a certain interval must elapse between the production of an author's works and their settlement as classical or the reverse; between their first appearance and, on the one hand, their taking a place among the established series of classics, or, on the other, their falling out of national sight and memory. Each era has its literature,—a proportion of it popular literature. Successive generations determine how much of the literature of previous epochs is to be estimated classical. No doubt, in many or most cases, each era establishes, at all events in the instance of its greatest ornaments, a fame and an appreciation which last. As in the times of Dryden and Pope, so in our days, these great writers are recognised and acknowledged as the *facile principes*, the undoubted greatest writers of their times. But in many instances the reverse is the case. Often are the popular idols of one age scorned or forgotten in the next. The Court poets, who sung songs to and wrote panegyrics on Bunyan's contemners and persecutors, are now forgotten. Bunyan's name is at once enshrined in the hearts of the great Anglo-Saxon race, and is held up by the calmest and severest of mere literary critics as a great, representative English classic.

It is a dictum of *belles lettres* and generalised literary history, that in the literature of each country there is an age of creators and an age of critics;—first, a grand gush of poetry, philosophy, and speculation, fresh distilled from nature, the indigenous, aboriginal product of the soil, with

unborrowed beauties, vigorous, effective, but withal rough and quaint;—and then an age of polish and refinement, of dialectic and critic skill, productive of histories, psychologies, and minor poetic efforts, not epics, or grand lyric bursts. On the whole, this is true; the two eras being in different proportions represented in different national literatures. Greece has the childlike, artless, natural, fresh, grand names of Homer, Pindar, Æschylus, Herodotus, as the representatives of the former period. The most philosophic of philosophic historians, Thucydides, the man-discerning Euripides, the amateur rhetorician Lysias, the systematising Aristotle, are representatives of the second class. Rome had the first class slenderly represented. Its literature owed so much to Greece as in some measure to denationalise it. And its writers copying Greek models,—Virgil, Plautus, and Tacitus, imitators as they were of Theocritus, Homer, Menander, and Thucydides,—naturally evinced the secondary graces of refinement and finish, rather than the untutored force and vigour which does shine in Latin literature through the Greek surface, and which would have still more decidedly characterised it, had the Romans been unhampered by foreign influences,—had Soracte been to them a Parnassus, Tibur a Tempe, Etruria an Arcadia. In modern times Spain and Italy have gloried in great galaxies of names characteristic of the era of sublimity and natural beauty. Calderon, Lopez, Cervantes; Tasso, Dante, Boccaccio, Petrarch, are in Spain and Italy the parallels of the English Chaucer, Spenser, Shakespeare, Bacon, Sidney. But neither Maritana and Suarez, nor Metastasio and Tiraboschi, match England's great names of the second era,—Milton, Pope, Addison, Bolingbroke, Johnson, Burke.

To this first class, the creative, inventive minds, who adorn the early literature of nations, is *par excellence* to be accorded the title 'Classics. They are the models for the

writers of after eras. After writers glean where they have not shorn, supplement where they have not exhausted. No literature is richer in early classics,—classics in this highest sense,—than English. No nation neglects more its early literature than England. Never, in the history of this world, was there a finer succession of writers, in poetry, philosophy, the drama, and theology, than from the death of Bloody Mary till the Restoration,—the era of Elizabeth, of James and Charles I., and of the Commonwealth. And yet few educated Englishmen are at all intimately acquainted with this early literature. In fact, it is a wonder that English literature remains so English and national as it is, after the various foreign rages which have possessed the national mind;—after its cramped passage through pedantic Græco-Roman influences early in the seventeenth century,—after its shameless Francomania after the Restoration, and which continued to influence English literature all through last century, and in the midst of its more recent German and mystical embroilment, fostered by barbarous poetasters and rabid critics and orators.

How refreshing is it to get away back to the Elizabethan era,—to drink long draughts of English undefiled,—to fight over again with our doughty ancestors the fights of Otterbourne and Halidon Hill,—to read the story of the “Nut-Brown Maid,” and the “Spanish Lady,” and the “English Gentleman,”—to kill fat bucks and peel willow-wands with “the English ballad-singer’s joy” in the glades of Sherwood Forest, or, leaving the Ballads, to journey with Chaucer to Canterbury,—to take up our abode with Sir Thomas More, Harrington, or Bacon, in their imaginary Utopia, Oceana, or New Atlantis,—to dwell with Kit Marlowe among his nymphs and shepherds,—to enter with Edmund Spenser the Bower of Bliss, or the House of Sleep,—with George Herbert, to sing “Virtue,” “Religion,” and

the "Sabbath-Day,"—with John Milton, to celebrate that first Christmas morn in

"the winter wild,
While the heav'n-born child
All meanly wrapt in the rude manger lies."

Let us justify our admiration and our preference by a few illustrative extracts from early English writers.

Of Chaucer may be given as a specimen the last verses he wrote on his death-bed, pregnant with wisdom and spirit :—

"Fly from the press, and dwell with sothfastness ;
Suffice unto thy good though it be small ;
For hoard hath hate, and climbing tickleness,
Press hath envy, and weal is blent o'er all ;
Savour no more than thee behoven shall ;
Rede well thyself, that otherfolk canst rede,
And truth thee shall deliver 'tis no drede.

Pain thee not each crooked to redress
In trust of her that turneth as a ball ;
Great rest standeth in little business ;
Beware also to spurn against a nalle ;
Strive not as doth a crocké with a wall ;
Deemeth thyself that deemest other's deed,
And truth thee shall deliver 'tis no drede.

That thee is sent receive in buxomness ;
The wrestling of this world asketh a fall ;
Here is no home, here is but wilderness ;
Forth, pilgrim, forth, O beast out of thy stall ;
Look up on high, and thank thy God of all ;
Waiveth thy lust and let thy ghost thee lead,
And truth thee shall deliver 'tis no drede."

From the poems of Dunbar, one of the ornaments of the court of James IV. of Scotland, we take the following with a fine Horatian smack, but savouring too much of the "Let us eat, drink, and be merry, for to-morrow we die" philosophy :—

" Be merry, man, and tak not sair in mind
 The wavering of this wretched world of sorrow ;
 To God be humble, to thy friend be kind,
 And with thy neighbours gladly lend and borrow ;
 His chance to-night, it may be thine to-morrow ;
 Be blyth in hearte for my aventure,
 For oft with wise men it has been said aforow,
 Without Gladness availes no Treasure.

 Make thee gude cheer of it that God thee sends,
 For world's wrak but welfare nought avails ;
 Nae gude is thine save only that thou spends,
 Remanant all thou bruikes but with bails ;
 Seek to solace when sadness thee assails ;
 In dolour lang thy life may not endure,
 Wherefore of comfort set up all thy sails ;
 Without Gladness avails no Treasure."

These verses are from Sir Walter Raleigh's "Country Recreations :"—

" Heart-tearing cares and quiv'ring fears,
 Anxious sighs, untimely tears,
 Fly, fly to courts,
 Fly to fond worldling's sports ;
 Where strained sardonic smiles are glozing still,
 And Grief is forced to laugh against her will ;
 Where mirth's but mummery,
 And sorrows only real be.

 Blest silent groves ! O may ye be
 For ever mirth's best nursery !
 May pure contents
 For ever pitch their tents
 Upon these downs, these meads, these rocks, these mountains,
 And peace still slumber by these purling fountains,
 Which we may every year
 Find, when we come a-fishing here."

Here we have Spenser, his verse stript of allegory, unbecomming such sincere divulgement of personal experience :—

" Full little knowest thou that hast not tried,
 What hell it is in suing long to bide ;
 To lose good days that might be better spent,
 To waste long nights in pensive discontent ;
 To speed to-day, to be put back to-morrow ;
 To feed on hope, to pine with fear and sorrow ;
 To have thy prince's grace, yet want her peers' ;
 To have thy asking, yet wait many years ;
 To fret thy soul with crosses and with cares ;
 To eat thy heart through comfortless despairs ;
 To fawn, to crouch, to wait, to ride, to run,
 To spend, to give, to want, to be undone !"

Sir Henry Wotton indites the following "Farewell to the Vanities of the World :"—

" Farewell, ye gilded follies, pleasing troubles ;
 Farewell, ye honour'd rays, ye glorious bubbles !
 Fame's but a hollow echo ; gold pure clay ;
 Honour the darling but of one short day ;
 Beauty, the eye's idol, but a damask'd sin ;
 State but a golden prison to live in,
 And torture free-born minds ; embroider'd trains
 Merely but pageants for proud swelling veins ;
 And blood allied to greatness, is alone
 Inherited, not purchased, nor our own ;
 Fame, honour, beauty, state, train, blood, and birth,
 Are but the fairy blossoms of the earth."

Early English literature, especially poetic literature, is a perfect paradise of sweets, excelling by far the literature of the eras of Pericles, Augustus, Leo the Tenth, and Louis Quatorze, full of richest nourishment and the most refreshing beauties ; its excellencies obvious, but standing the test of prolonged and renewed acquaintance ; its careful study one of the most enchanting and delightful of those literary pursuits which give dignity to leisure, and to over-tasked industry its most refining recreation.

J. M.

LION-HUNT IN ASSYRIA IN OLDEN TIMES.

COLONEL Sir Henry Rawlinson and Mr. Vaux of the British Museum, have laid before learned men and the public, since Botta and Layard first enlightened them, many intensely interesting objects from Nineveh and Babylon. None are of greater interest, perhaps, than the large octagonal cylinders of that ancient monarch, Tiglath-pileser I., found at Kallah-Shergat, believed, on good evidence, to be one of the towns alluded to in Scripture (Gen. x. 11, 12), a very ancient place, from which Mr. Layard procured a few remains, now in the Museum with the rest of his magnificent collection. Here that monarch reigned 1120 years before Christ, that is to say, nearly 3000 years ago, at, or about, the time when Samson was smiting the Philistines. In the same case at the British Museum, we have seen four cylinders, excavated at Muque-hur by Mr. Taylor, and presented by that gentleman, who obtained them at the very place whence Abraham came,—*that* “Ur of the Chaldees” mentioned in Gen. xi. 31. These cylinders contain an account of the restoration of temples by Nabonidus, the last king of Babylon, and on them is the name of his son BELSHAZZAR (Daniel, v. 1, 30). Near them are two cylinders, covered, like the others, with cuneiform characters, deposited by Nebuchadnezzar (Daniel, iv. 1, &c.), and excavated from the ruins of the celebrated “Birs-i-Nimrud,” Borsippa—a castle close to Babylon, rebuilt by the great monarch, “who promoted Shadrach, Meshach, and Abed-nego in the province of Babylon.” (Daniel, iii. 30.) Borsippa has been called “the Tower of Babel;” and it is just possible that it may have been founded on the ruins of that “daring work” of ungodly men, referred to in the 11th chapter of Genesis.

There will shortly be brought to this country* many sculptures procured by our excellent friend Mr. Loftus, "together with the inscriptions from Sennacherib's bulls, recording his wars with *Hezekiah*." A great authority on Babylonian and Assyrian antiquity has communicated, to the "Literary Gazette" for May 10, 1856, an account of a statue of the Babylonian god Nebo, now in the Museum, and executed, in a soft free stone, "by a sculptor of Kalakh (the Calah of Gen. x. 12, and the true original name of the mound called Nimrud), dedicated by him to his lord Phalukha, king of Assyria, and to his lady, Sammuramit, queen of the palace," — the celebrated Semiramis of history; so that, as Mr. Vaux truly observes ("Monthly Review," 1856, p. 315), we have here the "genuine ancient form of the name of one of the most remarkable ladies of antiquity, Semiramis, and this, too, no longer under the fabulous guise, which, owing to the Greek and Roman writers, she has so long worn; so far from this, she appears as a real historical personage, the wife of a king of Nineveh, about whose name, date, and lineage, there can be now scarcely more doubt than about Edward IV. or Henry VIII." This Phalukha is the ruler mentioned by the name of Pul, in 2 Kings, xv. 19, who is called Phalokh in the corresponding passage of the Septuagint, in 1 Chron. v. 26, to whom Menahem, king of Israel, gave "a thousand talents of silver, that his hand might be with him to confirm the kingdom in his hand;" which sum the king of Samaria exacted from the "mighty men of wealth, of each man fifty shekels of silver," when Pul "turned back and stayed not there in the land," as recorded so graphically in 2 Kings, xv. 20. This statue is now against a column, behind the great Egyptian head in the Great Central Saloon of the Museum—where it was placed May 16, 1856.

* See "Monthly Review," No. 5, for May 1856, p. 310; an article written by one possessing the best information on such matters.

On the same day the scaffolding was taken down, and on Saturday, the 17th May, the head of another great Assyrian monarch, recorded in the Bible, was exposed to the public view. The head and bust of Tiglath-pileser II., the king of that name who reigned about 740 years before Christ, and whose history, so far as it was connected with the Jews, is given in 2 Kings, xvi. 7, 10, and 2 Chronicles, xxviii. 16, 21. It is placed close to the entrance of the Kouyunjik Gallery, and is inserted in the wall near the head of the great roaring lion, which once stood at the side of a doorway to the small temple of Nimroud. The slab is 3 feet 4 inches high, and about 3 feet 6 broad, and its base is about 9 feet from the floor. We fancy that Tiglath-pileser has a ferocious look, at least compared with Sennacherib as displayed in the adjoining room. The name is in an inscription on the attendant behind him. Referring the reader to the chapters quoted, it may be well to remark how striking it is, that the king, whom king Ahaz went to visit at Damascus, should have his portrait displayed *at this very time*, more than 2500 years since it was sculptured. That "king of Assyria" came to Ahaz, when summoned, and took Damascus and killed Rezin, one of the enemies of Ahaz; but he "distressed" the king of Israel, and "strengthened him not" (2 Chron. xxviii. 20). King Ahaz went to Damascus to meet him (2 Kings, xvi. 10), and saw there "an altar,"—"the fashion" and "pattern" of which, "according to all the workmanship thereof," he "sent to Urijah the priest." This compliant priest built the idolatrous altar, "against king Ahaz came from Damascus," and assisted him in his sacrifices to the "gods of the kings of Assyria,"—"but," as the sacred historian records (2 Chron. xxviii. 23), "they were the ruin of him, and of all Israel." In *this* generation, as in *that*, it is well for ministers and people, for kings and subjects, to beware of the

“Altare Damascenum,” and to avoid “the very appearance of evil,” and to remember that the Shalmanesers and Sennacheribs were agents of a “higher Power.”

Two or three weeks ago a number of cases arrived at the Museum, containing Assyrian sculptures, found by Mr. Rassam at Kouyunjik. Some of these are put out and exposed to public view in a small passage off one of the long Nineveh galleries. We would particularly direct attention to one slab of these sculptures—a lioness crouching before a sitting lion, behind which is a large lily with three flowers, executed with great delicacy, the waved foot-stalk of the budding flowers evidently the result, as is the whole plant, and indeed the whole piece, of a careful study from nature. The curious geometrical, and otherwise ornamented floors, in the same place, are well worthy of minute inspection, and supply new matter for the chapters that have been written by Layard, and that will yet be written, on the ornamentation of Assyrian palaces.

But it is to a collection in one of the vaults, now temporarily placed there, that we desire to direct notice, and to that portion only which represents the hunting of the lion by one of the Assyrian monarchs, Assur-bani-pal, who lived some 640 years before the Christian era. This king was a veritable “Nimrod”—“a mighty hunter before the Lord”—a worthy descendant of his celebrated predecessor, alluded to in the 8th and 9th verses of the 10th chapter of Genesis. He seems to have been specially addicted to the exhilarating sport of the king of beasts; while these sculptures give a new force to the meaning of the 11th and 12th verses of the 2d chapter of Nahum—that Elkoshite, who prophesied “the burden of Nineveh” in a reign preceding that of the monarch Assur-bani-pal:—“Where is the dwelling of the lions, and the feeding-place of the young lions, where the lion, even the old lion, walked, and the lion’s

whelp, and none made them afraid? The lion did tear in pieces enough for his whelps, and strangled for his lionesses, and filled his holes with prey, and his dens with ravin."

On a series of slabs, some of them unfortunately charred by the fire which destroyed the palace, is represented the king in different attitudes—by very lawful anachronism—destroying lions and lionesses. A large tract of ground was selected, and appears to have been surrounded, or at all events guarded on two sides, by a double row of soldiers, the inner rank being formed of men with large bucklers close together—the men themselves armed, *inter cætera*, with long spears; behind this phalanx is a closely-arranged row of archers, each completely armed. The ground is kept by horsemen, also armed, who gallop about, some of them with a doubly-thonged whip, apparently less intended for the horse than for the beasts of prey. These officers have bows and arrows, and their horses, as well as themselves, are designed with great spirit and freedom. Many lions and lionesses have been killed; they lie about in all attitudes of helplessness, generally transfixed with many arrows, and some are designed with a freedom and correctness that are striking to artists of the present day. We may mention two well pleased with them—one, Mr. Wolf, whose ability as a painter of living animals is of the rarest kind; and Mr. Calder Marshall, the Royal Academician, a sculptor of great and of just celebrity. A lioness, with two arrows through her back, tries to crawl, her hind limbs paralysed by the wound in her spine; the agony of expression and the attempt to crawl are detailed with painful minuteness and with marvellous skill. Some lions, wounded in the lungs, are vomiting blood,—while one noble specimen bounds along with two or three arrows in his less vital parts; a fourth arrow is represented as whizzing through the air, while the king in his chariot, the horses urged by the driver, has

taken another bolt from the quiver and is about to launch it: the *action* of this figure is very fine; the contrast of the charioteer with the reins in his hand, urging the horses to their utmost speed, the two attendants behind with their long spears driving off or killing a wounded lion, springing on the back of the royal chariot, and the noble coolness and *forward* look of the monarch, carry the spectator to the scene. Indeed, the very pattern of his robes is given with the minutest detail;—the fine ornamentation of his tiara, “exceeding in dyed attire upon his head,” (Ezek. xxiii. 15), and the trappings of the noble horses, with the whole equipment of the large-wheeled chariots, are represented with a delicate accuracy that is surprising, and which even “a Pre-Raphaelite” could not rival.

In another part the king is stabbing, with a short dagger, an enraged lion, which in an erect posture attacks his car: the paws of its fore-legs are in a most unmistakable state of extension; the dagger seems to have pierced only the shaggy mane, but the spearmen have their shafts directed at the raging mouth, so that the dreadful retractile claws will soon be sheathed, and a well-armed and ferocious head will lick the dust. A cage is on the ground, and it is pegged; a man, who has himself a shelter into which to retire, has drawn up the door, and a lion is coming out, ready to spring. As the field gets clear, a fresh lion is being let loose to be attacked by this “mighty hunter before the Lord.” Pages descriptive of this great hunting scene might be given, but we must draw to a close with an episode at the end of the slabs. A large lion, belching blood, but still staggering—the enfeebled legs dragging on the ground, the action of the paws particularly worthy of notice—is approaching the double phalanx of men, who keep the field, and who have their spears extended before their shields, to receive the noble game, sorely wounded by the archers, whose arrows stick in his body.

Before this phalanx are four men, each with a large Thibet dog, collared and held back by a rope : the dog immediately before the lion is at a dead stand, evidently barking. The dog above this is pawing the ground with one of its fore-feet, impatient for attack ; the dog below is *pulling* to get at the lion, the head energetically turned to its keeper ; while the dog at the bottom has its muscles so much on the stretch, and is so urgent and excited, as to be in that state in which one has often observed a dog when it shows its sinews and the very action of the ribs and bones. We might linger over these slabs, and allude to a little artist-like *representation* of a part of a royal lion-hunt "*put in,*" with the most delicate feeling, above a garden or orchard, with many figures in it, some apparently within hearing of the dogs' barking and the lion's roar ; for the scene, just described, is separated from them only by the double phalanx of men. Two strongly *booted* attendants stop the horses of the king's chariot, one *clapping* the animals' neck with his hand, in that natural way so familiar to us all ; while the king is turning round to address some one. We may add that the king in the hunting-pieces has one of his hands, or rather the thumb and fore-finger of it, protected with a richly-worked covering or mitten, like that used by archers on a field-day. We may notice, too, the admirable heads of Thibet dogs* of considerable size, led by men who hold them back, with ropes attached to a collar : as well as to a group of men carrying a dead lion off the field. In another part of the Museum are clay models of the hunting dogs of Assur-bani-pal found at Nineveh, so that this king was fortunate in finding a Landseer of the day to design his hunting assistants, not only in bas-relief, but also in models.

We may mention, that the cases which contain the alabaster sculptures, found by Mr. Loftus in the same palace, but in another chamber, and at a lower level, and of which

* See "Excelsior," vol. v. p. 212.

we have seen the drawings only, appear to be among the finest works of art yet brought from Assyria. The king was the last but one who reigned. Of great interest to the Bible scholar, will be the sculptures from the palace of Esther, excavated by Mr. Loftus, at Shush—the ancient Shushan—about 150 miles E.S.E. of Babylon. This palace was built by Darius, the son of Hystaspes, and finished by Artaxerxes Mnemon, and destroyed probably by the Greeks.

The evidence of Assyria, so far as it is episodically given in Scripture, is now ripening into something much nearer maturity than it was in Ker-Porter's days. Botta, Layard, Rassam, and Loftus, have, by their researches, laid the historian and the lover of the Bible under great obligations. The attention of "the Christian world," but especially of *the Church*, seems by God Himself in His providence, to be attracted, at this time, to such books as Ezekiel, Nahum, Daniel, and Jonah,—four prophets specially full of matter about Nineveh and Babylon. He who "spake, as never man spake," did say, 1800 years ago, "The men of Nineveh shall rise in judgment with the men of this generation, and shall condemn them, for they repented at the preaching of Jonas, and a greater than Jonas is here." The stones and palaces of Nineveh and Babylon are gradually being brought to London and Paris; the British Museum, and National Museum, contain bas-relief and other portraitures of Shalmaneser, who took Samaria: of Tiglath-pileser, who took Damascus, and "helped not" King Ahaz: of Sennacherib, the king who humbled Hezekiah. Perhaps the days may be nearer, than many imagine, when "the men" themselves "shall rise." "Heaven and earth shall pass away, but MY WORDS shall not pass away, till all be fulfilled."

A. W.

May 21st, 1856.

THE APOSTLE PAUL IN COMMON LIFE.

WE hear much in the present day about religious and secular education; but, even for the present life, the Bible is the best book after all. No situation in which man can be placed, either collectively or individually, is omitted in its pregnant pages; for every such situation we may find an example, a promise, or a warning. The famine and the pestilence are there; the battle and the tempest are there; the journey by land and the voyage by sea; the siege and the ambuscade; the furious mob and the glad assembly; the shout of victory and the wail of defeat. Every incident in domestic life is there; the marriage and the funeral; the joy for a first-born son, and the grief at parting with an aged parent; the sweets of home-bred affection; the horrors of fraternal discord; the mortification of the proud, and the calm enjoyments of the humble.

It is our intention, in the present paper, to select a few incidents in the life of the Apostle Paul, for the purpose of showing his manly and practical common-sense in the business and intercourse of life. We do not mean to expatiate on his apostleship, which he received not from man, nor by the will of man; nor on those letters on theology and morals, which take their place among the "other Scriptures"—*an inheritance for ever* to the Church and mankind, far more precious than all that Greece could boast as entitled to that proud distinction. Nor shall we dwell on any of those orations in the Acts, where he adapts his sentiments and language with such matchless dignity and propriety to the character and circumstances of his hearers. A few transactions and advices, not particularly prominent in his history, but well worth attending to, are the following:—

I. There was a sect of philosophers among the ancients well known by the name of Stoics, whose pretensions to wisdom and virtue were of the loftiest character. Their wise man was not only a man, but equal to the gods. They counted virtue the only good, and vice the only evil: outward things they reckoned to be quite indifferent. They spoke loftily concerning oppression; neither pain nor exile, nor imprisonment nor death, made any impression on them, *neque mors neque vincula terrent*. On one occasion, St. Paul showed that he had no sympathy for such transcendental apathy. When he wished the highest good for those royal and august personages before whom he was pleading his own and his Master's cause, he said: "I would to God that not only thou, but also all that hear me this day, were both almost, and altogether, such as I am, *except these bonds*."

II. Epaphroditus, one of the Apostle's companions in his travels and preaching of the Gospel, had been dangerously ill, and the knowledge of this had occasioned great sorrow in the hearts of his Christian friends at Philippi. No doubt they were persuaded, that to their pious friend death was but the entrance into life eternal. St. Paul had told them, in this very letter, that to himself to live was Christ, and to die was gain; yet, still, the universal feeling of human nature is, that when our friends are sick we should like them to recover; and, accordingly, we find the great Apostle speaks as a plain, every-day man, when he says: "Indeed he was sick, nigh unto death; but God had mercy on him, and not on him only, but on me also, lest I should have sorrow upon sorrow."

III. At Philippi, St. Paul and his companion Silas, had been shamefully treated, scourged with many stripes, and their feet made fast in the stocks. There in the inner prison, they sang praises to God; and God by His mighty power

interposed in their behalf, loosed the bands of every prisoner, and made their keeper a trophy of redeeming grace. The magistrates, who had so barbarously misused them, whether from some misgivings as to their own proceedings, or terrified by the transactions of the night, sent a message by their lictors in the morning to let them go. Their new convert, no doubt completely softened in temper by his wondrous change, was delighted to give them tidings of their delivery, and to bid them go in peace. But Christian as he was, the Apostle felt as a man; he had been unjustly handled, and he would not sneak away like a craven felon. "They have beaten us openly uncondemned, being Romans, and have cast us into prison; and now do they thrust us out privily? Nay, verily, but let them come themselves and fetch us out." And they did come, and had to own themselves in the power of those whom they had insulted; they *besought* them and brought them out.

IV. A vexatious persecution, on the part of the Jews, had subjected the Apostle to much inconvenience, and even to imminent danger of his life, both from popular tumult and from a conspiracy for his assassination; and although not quite in a dungeon or in the stocks, the time-serving and bribe-loving provincial magistrates had kept him a prisoner for more than two years, so that he determined at length to endeavour to obtain justice from the higher powers. We can easily imagine some zealous countryman of his own attempting to dissuade him from this step. Would you sanction by your acknowledgment of his authority the usurpation of the Emperor over the land of our fathers, or plead your cause before a tyrant infamous for every crime, and stained with innocent blood? I find (might the Apostle say,) I find in the Providence of Him who gives the kingdom to whom He will, that this man has power over the Roman world; I inquire not how he got that power, nor

with what crimes he is chargeable ; I see he actually can control all inferior judges ; “ I fly from petty tyrants to the throne :” *I appeal unto Cæsar.*

V. We have little idea in our times and in countries professing Christianity, what difficulties beset the hourly path of the first converts from heathenism. Living in cities wholly given to idolatry, surrounded by temples of surpassing beauty, lured on every hand to practise rites well adapted to please the sensual appetites of fallen man ; where the ox, as Gibbon says with great glee, at once appeased the gods, and furnished a supper for their joyous votaries, it was no easy matter for the newly enlightened converts to keep themselves unspotted from the world. If they ate things offered to idols, it was equivalent to owning their existence and their sacredness, and thus denying the only true God, and Jesus Christ whom He had sent. We can suppose the weak and the timid telling them their need of the utmost circumspection ; that it was their duty to abstain from the appearance of evil, and not to eat a morsel of meat, till they had inquired diligently whether it was in any way connected with an idol. No one knew better than St. Paul, what a precious jewel a tender conscience is : in this he exercised himself “ to maintain a conscience void of offence towards God and men.” But he did not perplex himself with needless scruples, nor did he lay any undue burden on his beloved converts. Even in the licentious Corinth itself, he tells them to go to the public market, eat what is sold there, *asking no questions*, for conscience sake.

It would not be difficult to select, from the sayings and doings of the great Apostle, many more instances of his noble, manly, practical character. No monkishness nor misanthropy is to be found in him. A heart burning with zeal for the eternal interests of his fellow-creatures, was

united with a frankness, and common-sense view of common things, that would have made him a delightful companion, even if he had never travelled beyond his own street or village. The inference we wish to be drawn from this paper, by our readers, and especially by our young friends, is this, that it is as true now as of old, that God's word is the best lamp unto their feet, and the best light unto their path; that its hidden treasures will reward all their search; that it should be read, and read, and read again, till it truly becomes the engrafted word, which is not only able to save their souls, but to teach them to order the affairs of this life with discretion.

A. M.

REVIEW OF THE MONTH.

SUPREMELY silly in its contents, and not much indebted to the care of its Right Honourable editor, the Memoir of Tom Moore has dragged to a close. Scarcely needed for such a purpose, it is useful as showing how little heart and how little strength of principle enter into the composition of a popular member of fashionable society, and its insincere and frivolous pages contribute one illustration more to the Preacher's "vanity of vanities." But, considering the fame of the Irish minstrel, it is surprising how few are the gleams of wit or genius, or even hearty emotion, which occur throughout these egotistic journals; and unless their occasional jokes should furnish a slender supplement to the next reprint of "Joe Miller," we scarcely know any useful purpose which will be served by these eight gossiping octavoës. It had been well for the poet's memory had "Lalla Rookh" and the "Irish Melodies" been his only monument.

A very different biography is "The Memoir of Dr. John

Kitto." It is not only an affecting record of difficulties overcome in the pursuit of knowledge, but a cheering example of a life devoted to noble and enduring purposes. The materials available are of a peculiarly interesting character, and have been turned to the best account by a skilful and conscientious biographer. We congratulate Mr. Ryland on having linked his name so honourably and so indissolubly with the histories of men so different, but each of them so distinguished, as John Kitto and John Foster.

From the pen of Dr. John Young there has just appeared a volume, entitled, "The Mystery: or, Evil and God." From the rare delight with which we read the author's "Christ of History," we opened this new work with eager expectation. And we have not been disappointed. It is seldom that an abstruse subject is placed in a light so clear, or that profound thoughts are expressed in language so plain. All portions of the argument are not to our mind equally strong, and expressions occur which would seem to point to an eventual restoration of all the fallen, although it must be admitted that these are met by others which appear to involve the opposite conclusion. But although, on this momentous question, we could have wished a more explicit avowal of the author's opinion, we are grateful to him for what he has done. His work contains many deep thoughts and many overlooked but important distinctions. It is written in the spirit of a truly Christian philosophy, earnest, candid, reverential. Its object is to vindicate the ways of God, and in the most difficult field of inquiry few efforts have been so successful.

With the 101st Number, Auldjo's "Ascent of Mont Blanc," we believe that the Traveller's Library concludes. We have just received the last Number of "Reading for Travellers," being "Alfieri; his Life, Adventures, and Works," by one who is better acquainted with these than

most Englishmen, Mr. C. M. Charles. It is a lively and amusing sketch of an extraordinary man, and the specimens of Alfieri's tragedies possess a merit rare in translation ; they are excellent poetry.

Mental science has lost the mightiest of all its recent devotees ; one who, to the native force and acuteness of a Reid or Hume, added the industry and erudition of a Cudworth. Sir William Hamilton was born at Glasgow in 1788, and died at Edinburgh on the 6th of May last. In the University of the Northern Metropolis he had held the chair of Logic since the year 1836 ; and his Lectures, which will now doubtless be published, have given an impulse to metaphysical studies which cannot be confined to Scotland.

In the "Athenæum" of May 3 is an account of an interesting discovery made at Jerusalem by Mr. Douglas and his friends. About 150 yards eastward of the Damascus Gate, and outside the city, they were guided by an Arab to an opening in the side of the valley, not much larger than the burrow of some wild animal. On entering, they found themselves in a succession of enormous vaults, which, from the chips and squared blocks of stone still remaining, as well as from the markings on the sides, were evidently ancient quarries. Some of the blocks, partly dressed, corresponded to the stones, so remarkable for their size, built into the south-east corner of the wall of Jerusalem ; and so enormous were the excavations, that Mr. D. says, they may have "yielded stones enough to build, not only the Temple, but the whole of Jerusalem." The condition of the remaining blocks also illustrates the statement in 1 Kings, that "there was neither hammer nor ax nor any tool of iron heard in the house, while it was in building."

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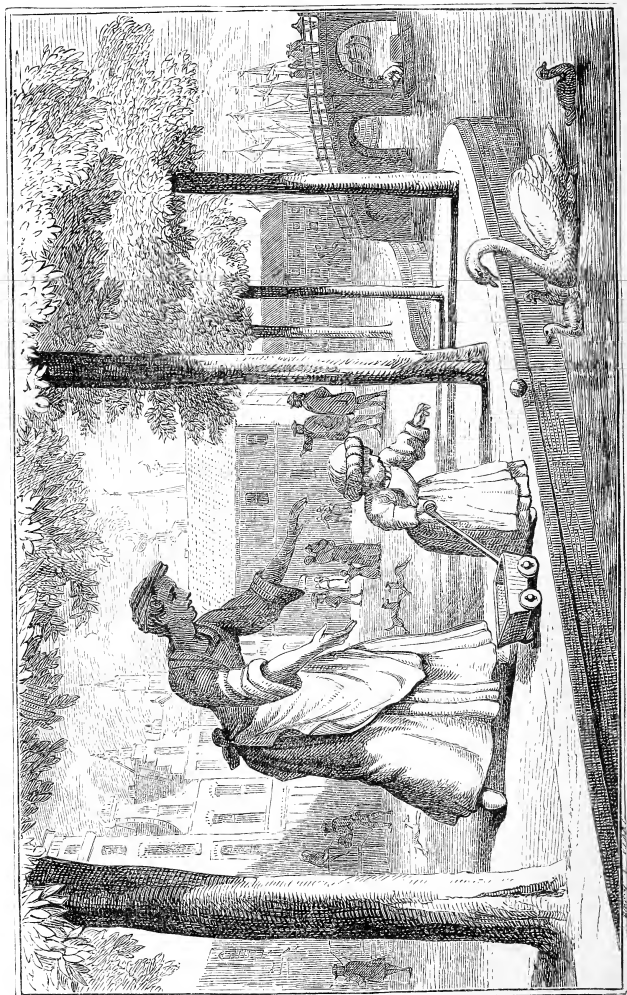
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EXCELSIOR.

EMBLEMS.

THE picture now before the writer represents two mastiffs worrying one another, whilst a lean cur is running off with the bone. Such a picture tells its own tale. According to the mood of the moraliser, the dogs which strive for the bone may represent two litigious neighbours or two nations at war, and the dog that carries off the prize will in that case be a lawyer or a neutral power. The next picture to which we turn reads its lesson no less plainly. A spider is catching a fly, and a lizard is about to spring at the spider, and a stork is preparing to gobble the lizard, whilst a serpent is ready to sting the stork, and a man to kill the serpent. Many "wise saws and modern instances" are called up by the spectacle; but the designer has given it a turn more grave and suggestive by quoting Eccles. v. 8, "If thou seest the oppression of the poor, and violent perverting of judgment and justice in a province, marvel not at the matter: for he that is higher than the highest regardeth; and there be higher than they."

These pictures are Emblems. Through the medium of some well-chosen incident or object, they are intended to convey some important truth or moral lesson. To all intents they are pictorial proverbs, and as they not only entertain the eye, but as their somewhat enigmatical character makes a gentle demand on the observer's ingenuity, they have always been a popular mode of conveying instruction. Perhaps all the rather because they do not necessarily in-trench on the doctrinal domain, they have long formed an

extensive element in the literature designed for the laity of the Church of Rome. A collection published by Alciati, a learned lawyer, who died at Padua in 1550, has been translated into almost every language of Europe; and those of Benedict Hæften, a monk at Utrecht, in the following century, have been much admired. The pictures of Hermann Hugo, the Jesuit, have been appropriated by Francis Quarles to adorn his well-known verses; and Hugo's own excellent poetry was translated into English by Edmund Arwacker and was widely read in the reign of Charles II.

It is seldom that the Emblem is merely pictorial. Usually the author comes to the help of the artist, and in a pithy sentence or proverb, or, still more frequently, in a poetical ditty, he expounds the engraver's riddle.

The oldest English collection with which we are acquainted is, "A choice of Emblemes, and other Devises, for the most parte gathered out of sundrie writers, Englished and Moralized, and divers newly devised, by Geoffrey Whitney. Imprinted at Leyden 1586." The cuts are primitive and very poor; but there is often much spirit in the verses. For instance, the engraving represents two men, facing one another, with three eyes lying on the ground between them. It would need *Cædipus* to explain it; but says old Geoffrey,—

"The gods agreed two men their wish should have,
And did decree who first demand did make
Should have his wish, and he that last did crave
The other's gift should double to his take.

The Covetous wretch and the Envious man,—
These were the two that of this case did scan.
They long did strive who should the first demand.
The Covetous man refused, because his mate
Should have his gift then doubled out of hand:
The thought whereof upon his heart did grate.

Wherefore the gods did plague him for his sin,
And did command the Envious man begin.

Who did not crave what Midas chief did choose,
 Because his friend thereof the fruit should find :
 But only wish'd that he one eye might lose,
 Unto the end to have the other blind :

Which being said, he did his wish obtain,
 So but one eye was left unto the twain.
 See here how vile these caitives do appear
 To God and man : but chiefly (as we see)
 The Covetous man, who hurteth far and near.
 Mere spiteful men their own tormentors be.
 But both be bad, and he that is the best
 God keep him thence where honest men do rest."

"Ex bello, pax," is a companion picture to Landseer's
 "War and Peace." It is a helmet which bees have con-
 verted into their hive,—originally a device of Alciati,—and
 the legend is,—

"The helmet strong that did the head defend,
 Behold, for hive the bees in quiet serv'd ;
 And when that wars with bloody blows had end,
 They honey wrought where soldier was preserv'd :
 Which doth declare the blessed fruits of peace,
 How sweet she is when mortal wars do cease."

Our next picture is a house, from an upper window of
 which a monkey is scattering handfuls of money into the
 street : an emblem of the ways in which fashionable wives
 and foppish heirs squander the miser's fortune :—

"An usurer who made his god his gold,
 Within his house a peevish ape retain'd :
 A servant fit for such a miser old,
 Of whom both mocks and apish mows he gain'd.
 Thus every day he made his master sport,
 And to his clog was chained in the court.
 At length it happ'd, while greedy grandsire din'd,
 The ape got loose, and found a window ope,
 Wherein he leap'd, and all about did find
 The god wherein the miser put his hope ;
 Which soon he broach'd, and forth with speed did fling,
 And did delight on stones to hear it ring.

The sight right well the passers-by did please,
 Who did rejoice to find these golden crumbs,
 That all their life their poverty did ease.
 Of goods ill-got, lo! here the fruit that comes.
 Look hereupon, you that have Midas' mint,
 And be possess'd with hearts as hard as flint."

In the Civil War, George Wither sold his estate and raised a troop of horse for the Parliament. He was taken prisoner; but his brother bard, Sir John Denham, begged the king not to hang him, "because as long as Wither lived, Denham would not be accounted the worst poet in England." Of all the English writers of Emblems his works are now among the rarest, a perfect copy costing as much as six or eight guineas. His conceits are often happy, and his rhymes are fluent and pleasing. A squirrel is represented turning its tail, umbrella-wise, to a shower of rain, meanwhile munching a filbert, and Wither sings:—

"The little squirrel hath no other food
 Than that which Nature's thrifty hand provides,
 And, in purveying up and down the wood,
 She many cold wet storms for that abides.
 She lies not heartless in her mossy dray,
 Nor feareth to adventure through the rain;
 But skippeth out and bears it as she may,
 Until the season waxeth calm again.
 Right thus have I and others often far'd:
 For when we first into the world were brought,
 We found but little for our use prepar'd,
 Save that which by hard labour must be sought.
 In many storms, unheeded, we are fain
 To seek our needful things, and smilingly
 To jest at what some others would complain,
 That none might laugh at our necessity.
 Yea, some have lived on husks, whilst others fed
 On that which was their labour's due reward,
 And were pursued till they were almost dead,
 Without the world's compassion or regard.

Yet, by enduring, they outlived the blast
 Of adverse fortune, and with good success
 (Expecting calmer seasons) at the last
 Arrived at the port of Happiness.
 All grief shall have an ending, I am sure,
 And, therefore, I with patience will endure."

The picture of an archer suggests the following stanzas :

" When to the fields we walk to look upon
 Some skilful marksman, so much heed we not
 How many arrows from his bow are gone,
 As we observe how nigh the mark he shot.
 And justly we deride that man who spends
 His time and shafts, but never aim doth take
 To hit the white, or foolishly pretends
 The number of the shots doth archers make.
 So God, who marketh our endeavours here,
 Doth not by tale account of them receive ;
 But heedeth rather how well-meant they were,
 And at His will how rightly aim'd we have.
 It is not mumbling over thrice a-day
 A set of Ave-Marias or of creeds,
 Or many hours formally to pray,
 When from a dull devotion it proceeds.
 Nor is it up and down the land to seek
 To find those well-breath'd lecturers, that can
 Preach thrice a-Sabbath and six times a-week,
 Yet be as fresh as when they first began.
 Nor is it such-like things perform'd by number
 Which God respects : nor doth His wisdom crave
 Those many vanities wherewith some cumber
 Their bodies, as if those their souls could save.
 For not much-doing, but well-doing that
 Which God commands, the doer justifies.
 To pray without devotion is to prate,
 And hearing is but half our exercise.
 We ought not, therefore, to regard alone
 How often, but how well, the work is done."

The name, however, which in England we have learned

to associate with Emblems is that of Francis Quarles. Like Alciati he was a lawyer, and like his contemporary Wither he suffered from the troublous times of Charles I.,—with this difference, that he was a Royalist. They both died in London. Quarles was buried in the church of St. Vedast, Foster Lane; Wither in “the Savoy.” Like his Republican rival, Quarles was a very voluminous poet. The vignettes of his Emblems, as has already been mentioned, are chiefly copied from Hugo’s “*Pia Desideria*,” and those of his “*School of the Heart*” are taken from Hæften’s “*Schola Cordis*;” but the poetry is entirely original. Both works have been remarkably popular, or, as Anthony à Wood expresses it, “they have been and still are in wonderful veneration among the vulgar.” For that veneration, however, there is a deeper reason than could occur to the contracted mind of Anthony. Their charm is their piety. In pleasing numbers they express those feelings of which most devout spirits are in some degree cognisant, and the imagination is gratified whilst the heart is made better. As a critic, more profound because more genial than the crabbed Oxonian, Thomas Fuller, has said, “His *visible poetry* is excellent, catching therein the eye and fancy at one draught.” And even those Cowley-like conceits in which his verses abound hardly offend us: they seem appropriate in Emblem-literature. We must be content with one specimen. The picture is a child in a go-cart, with the motto, “Hold up my goings in thy paths, that my footsteps slip not;” and the following is the poetry:—

“ Whene’er the old exchange of profit rings
 Her silver saints’-bell of uncertain gains,
 My merchant-soul can stretch both legs and wings,
 How I can run and take unwearied pains!
 The charms of profit are so strong, that I
 Who wanted legs to go, find wings to fly.

If time-beguiling pleasure but advance
 Her lustful trump, and blow her bold alarms,
 O how my sportful soul can frisk and dance,
 And hug that siren in her twined arms !
 The sprightly voice of sinew-strength'ning pleasure
 Can lend my bedrid soul both legs and leisure.

If blazing honour chance to fill my veins
 With flatt'ring warmth and flash of courtly fire,
 My soul can take a pleasure in her pains,—
 My lofty-strutting steps disdain to tire :
 My antic knees can turn upon the hinges
 Of compliment, and screw a thousand cringes.

But when I come to thee, my God, that art
 The royal mine of everlasting treasure,
 The real honour of my better part,
 And fountain of eternal pleasure,
 How nerveless are my limbs ! how faint and slow !
 I have no wings to fly, nor legs to go.

So when the streams of swift-foot Rhine convey
 Her upland riches to the Belgic shore,
 The idle vessel glides the wat'ry way,
 Without the blast, or tug of wind or oar :
 Her slipp'ry keel divides the silver foam
 With ease ; so facile is the way from home !

But when the home-bound vessel turns her sails
 Against the breast of the resisting stream,
 O then she slugs ; nor sail nor oar prevails ;
 The stream is sturdy, and her tide's extreme :
 Each stroke is loss, and ev'ry tug is vain,
 A boat-length's purchase is a league of pain.

Great ALL IN ALL, that art my rest, my home :
 My way is tedious and my steps are slow :
 Reach forth thy helpful hand, or bid me come ;
 I am thy child, O teach thy child to go :
 Conjoin thy sweet commands to my desire,
 And I will venture, though I fail or tire."

Of all our English authors there is no one from whom

we should have so readily expected these “dainty devices” as the great Christian allegorist. And we have them. “A Book for Boys and Girls; or, Temporal Things Spiritualised,” is a little book of Emblems by John Bunyan. The talismanic touch of the mighty tinker may be perceived in sundry passages; but quaint, sensible, and homely as they are, it is scarcely fair to treat them as poetry.

“ *Upon the Frog.*

The frog by nature is both damp and cold,
Her mouth is large, her belly much will hold;
She sits somewhat ascending, loves to be
Croaking in gardens, though unpleasantly.

Comparison.

The hypocrite is like unto this frog,
As like as is the puppy to the dog.
He is of nature cold, his mouth is wide
To prate, and at true goodness to deride.
He mounts his head as if he was above
The world, when yet 'tis that which has his love;
And though he seeks in churches for to croak,
He neither loveth Jesus nor His yoke.”

“ *Upon a Penny Loaf.*

Thy price one penny is in time of plenty,
In famine doubled, 'tis from one to twenty:
Yea, no man knows what price on thee to set,
When there is but one penny loaf to get.

Comparison.

This loaf's an emblem of the Word of God,
A thing of low esteem before the rod
Of famine smites the soul with fear of death,
But then it is our all, our life, our breath.”

“ *Upon the Fish in the Water.*

The water is the fish's element;
Take her from thence, none can her death prevent:
And some have said, who have transgressors been,
As good not be as to be kept from sin.

The water is the fish's element ;
 Leave her but there, and she is well content :
 So's he, who in the path of life doth plod ;
 Take all, says he, let me but have my God.

The water is the fish's element ;
 Her sportings there to her are excellent :
 So is God's service unto holy men,
 They are not in their element till then."

The most recent work of this kind with which we are acquainted is an American publication, "Religious Emblems and Allegories," by the Rev. W. Holmes. The engravings are in the most humble style of art, but the accompanying poetry and prose are sensible and scriptural, and sometimes ingenious.

But the great magazine of this kind of literature is locked up in the language of the Netherlands. With the works of Cats, Spinniker, Hesman, Hoogstræten, Heins, Elger, De Brune, Nerrincq, Poirters, Luiken, Houbraken, Bogaert, and others, in Dutch and Flemish, besides Reifenbergius, Camerarius, Schöonhovius, and many more in Latin, it would be possible to form, as some friends of ours have formed, a very curious, but withal a very costly library. On some future occasion we may give our readers a specimen of the incomparable Cats. Meanwhile, the present number contains a design taken from a Dutch book of Emblems ; and should any modern Quarles feel moved to "quicken" it into poetry, we shall be happy to present his version to our readers.

H.

THE DULL WATERING-PLACE.

“NOT to Hastings, my dear aunt; do not let us go to Hastings!” exclaimed a tall young girl, running up to her aunt, who was reclining in an easy chair by the fire one evening studying “Bradshaw’s Railway Guide” with much attention.

“And why not to Hastings, Eleanor?” asked her aunt. “I should have thought it just the kind of place you would particularly like.”

“Oh, aunt! how can you say so?” said the young lady, rather reproachfully. “Don’t you remember what the people who were here last week said about it?—That it was the dullest place they ever were at in their lives. They called it *insufferably* dull. I remember the expression perfectly, for I thought it so strong.”

“It was certainly a sweeping observation,” remarked Mrs. Mortimer, laughing. “But who were those people, Eleanor? for, to tell you the truth, I have quite forgotten all about them. Stay a moment, though! I think I know whom you mean. Lady Charlotte Lennox and her daughter—eh?”

“Yes, aunt. And have you really forgotten what they said about that wretched Hastings?”

“Quite, Eleanor; but you have not, so tell me all about it. I am just now in a pleasant, dreamy condition, in which listening is particularly agreeable. What did they say?”

“They said the place was so stupid, it was impossible to say *how* stupid, and horridly vulgar ——”

“I wonder whether Lady Charlotte Lennox and her daughter ever learnt the Lord’s Prayer, the Belief, and the Ten Commandments in the *vulgar* tongue,” interrupted Mrs. Mortimer, with her eyes shut.

“Aunt, you are half asleep, and still laughing,” said Eleanor. “I wish I had not told you about the ‘vulgar,’ for I remember how you quiz the word. But never mind about that. They said, besides, that Hastings was a most uninteresting place—that there was nobody there—that there was nothing to be seen there—nothing to do—nothing going on,—in short, ‘insufferably dull’ comprehended the whole.”

“And a frightful whole, too!” exclaimed Mrs. Mortimer, putting her hands over her ears, as if to shut out the sound. “Not a word more, I implore you, my dear child. I would not take you to such a place as you have described for all the world, neither would I go myself: I should be miserable; and as for your poor uncle—still, to be sure, *he* would take his occupation with him—but such a place is not to be thought of. Dear me!” continued Mrs. Mortimer, after a short pause, “how Hastings must have altered since I was there! The Butlers and Sweetloves lived there then. But I daresay they are dead and gone now, and everything is changed.”

“Who were the Butlers and Sweetloves, aunt?” inquired Eleanor. “Two families that you knew?”

“Yes, my dear.”

“Nice ones, aunt?”

“Very amusing ones, my dear.”

“I wish they were there now,” sighed Eleanor.

“I should wish so, too,” observed Mrs. Mortimer, “if we were going to Hastings; but if we are not, it cannot much signify who lives there, I should think.”

Mrs. Mortimer spoke this very slowly, for she really was getting very sleepy, indeed.

“My dear aunt, do have a nap,” cried Eleanor, “and I will wake you at the end of half-an-hour.”

“Thank you, dear, I really think I must; so good night

for a little bit;" and so saying, Mrs. Mortimer shut her eyes, and was soon fast asleep.

Eleanor gazed for a few moments at the fire; then she got up and lit a candle and opened a book, but she discovered that she was unable to read, her thoughts were so unsettled. She was thinking about what Lady Charlotte Lennox had said. She had found, in the course of repeating it to her aunt, that it sounded very silly and unmeaning, and she began to wonder whether Lady Charlotte Lennox's opinion was correct or not. She wondered very much, too, who the Butlers and Sweetloves were, whom her aunt thought such amusing people; whether they really were dead and gone, or not; whether Lady Charlotte Lennox knew them or not: but *that* she could find out from Miss Lennox next time she saw her. She felt sure her aunt had been laughing to herself, and she wondered why.

And so she went on with her thoughts and wonderings, but not in perfect idleness, by any means, for she had taken up that great resource of women, needlework, when the thinking-fit came on; so she sat hemming, as well as thinking, for at least half-an-hour; at the end of which time she began to long to talk again; and after looking at her aunt several times, she at last addressed her,—

"Aunt!"

"My dear—yes—are you there?" asked Mrs. Mortimer, awaking.

"I have been here ever since, aunt, working away, and thinking about Lady Charlotte Lennox and Hastings."

"Oh, do forget them as fast as possible, there's a good girl!" cried Mrs. Mortimer, rousing up. "What *can* be the use of thinking about anything so 'insufferably dull' as—*Hastings*, I suppose I meant to say," added Mrs. Mortimer, with a smile, "not Lady Charlotte Lennox, of course! Nay, my dear, you need not look at me so inquiringly. I am

not in the habit of calling either people or places ‘insufferably dull.’ Everything and everybody has an interesting side, even — But, come! let us forget all about it, and do you take the ‘Bradshaw’ and amuse yourself by looking out for another place to go to.”

And so saying, Mrs. Mortimer leant back in her chair once more.

Eleanor took the “Bradshaw,” and opened the map, and read to herself a number of names; but, of course, this was all she could do.

“There’s no use in my reading a quantity of names, aunt,” she observed at last, in rather a deplorable voice; “I know nothing about any of the places: I wish I did. Don’t *you*, aunt? I feel sure, indeed, that you must. You must have been to other places on the south coast besides that tiresome Hastings. How sleepy you look! but you really must not go to sleep again, for my uncle will be coming back soon to tea. Do wake up, and give me a description of some other places.”

“You are very ingenious, Eleanor,” replied Mrs. Mortimer; “but supposing that I were to do what you ask, and enchant you by a description of some place I like, and then that to-morrow another Lady Charlotte Lennox were to call and tell you it was as ‘insufferably dull’ as Hastings, and so stupid—she couldn’t tell *how* stupid—what should you do?”

Eleanor laughed.

“Now you are bringing back the conversation to Lady Charlotte Lennox yourself, aunt!”

“So I am, I declare!” said Mrs. Mortimer; “but I had no intention of doing so. It is because I am half asleep, I should think.”

“Not a bit of it, aunt! You are shamming now, for I see you can hardly help smiling all the time. So do begin

and tell me a long story about some nice place or other, to put—you know what—out of my head.”

“Well, but on one condition, Eleanor,” said Mrs. Mortimer.

“What is it, aunt?”

“Why, that if you *really* like and believe my description, you do not take a dislike to the place from any other people’s remarks about it.”

“Indeed I will not.”

“Good! Now, then, take up your work and listen very attentively, for I am going to be very exact and correct; and you may ask me any questions you please, as we go along, only I shall not tell you the name of the place just yet.”

“This is charming!” exclaimed Eleanor, seating herself very near the easy chair in which Mrs. Mortimer was once more leaning back, as if determined to be as near going to sleep as possible.

“Are you ready, Eleanor?”

Mrs. Mortimer’s eyes were shut.

“Ready and waiting,” laughed her niece.

“Well, then,” said Mrs. Mortimer, looking round with pleasure at the good-natured smile that lit up her eager niece’s face, “once upon a time, there was a beautiful old town, in the midst of which stood a venerable ruined castle ——”

“*Dover*, aunt!” shouted Eleanor, as quick as lightning.

“As you please, my dear. I thought I had protested against telling the name at present.”

“I beg your pardon, dear aunt, but I feel that it *must* be Dover; and I am so much pleased, I don’t know what to do. We shall see Shakspeare’s Cliff,—and the French coast, and, perhaps,—oh, perhaps, aunt,—actually, don’t you think my uncle will consent to make a trip across the Channel and touch French soil, and if so ——”

“Good night, Eleanor,” interrupted Mrs. Mortimer.

“Aunt!” exclaimed Eleanor.

“What, my dear? You don’t want me, I am sure. You are telling all the story yourself.”

“No, no, no! I won’t speak again; only why *did* you talk about the old castle?”

“Because there *is* an old castle at the place I mean.”

“Pray go on, aunt; I will be as quiet as possible.”

“Well, then, this old ruined castle stands on the top of a high cliff; and the high cliff faces that grandest sight of nature—the everlasting ocean; so that it is quite a wonder to me that the warders, who, in olden times, used to walk up and down the battlements, and blow their horns amidst the roar of the waves, and often through the howling of the tempest, did not one and all become illustrious poets.”

Eleanor smiled, and laid her finger on her lips, enjoining silence on herself. Mrs. Mortimer answered her look.

“I dare say you would like to know whether the castle is a beautiful one now, Eleanor. No! there are but a few imperfect traces of it left. No decay, however, can alter the grandeur of the situation; and as you look down from those fine heights, imagination can do as much, or more for you, perhaps, than the reality would have done; for certain it is, that in the days when castles were in their most romantic and magnificent state, neither the owners nor the warders took the picturesque and poetical view of them that you and I do now.”

“How was that, I wonder?”

“It is difficult to say, only we know that as

‘Distance lends enchantment to the view,’

so it softens down all the asperities and deficiencies which disturb the perfection of every scene we contemplate closely. Looked at from afar, we see nothing but the romantic fea-

tures of those early days of civilisation ; whereas the practical working of them may have been so rough and harsh, that neither poetry nor romance had a chance of flourishing among them.

“Certainly, as regards my old castle, we must content ourselves with what it was rather than what it is ; for it is a very tumble-down affair, indeed ; and then a somewhat unromantic fate has befallen those venerable remains of former grandeur. They have been turned into tea-gardens by the ingenious inhabitants of the place.”

Eleanor uttered an exclamation at the idea of such a desecration.

“Aye, that’s all very well, my dear,” observed Mrs. Mortimer, “viewing the thing romantically ; but now, Eleanor, let us take a peep at the other side of the picture ; what you would be inclined to call the merely practical side. Think, now, of the comfort and pleasure those tea-gardens afford to quantities of people who work hard most of their lives, and only now and then get a holiday in which to enjoy themselves. Many and many a gay party spend an evening of enjoyment on that beautiful spot, who would otherwise never have seen it, except, perhaps, once in their lives, just to walk round it, staring at the untidy, and, to them, unintelligible remains of antiquity, with vacant faces and puzzled minds. If even the old possessors of the castles themselves never viewed them through a poetic halo, how can you expect the working millions of a decidedly unpoetical state of society to do so ? But no matter. The place is comfortable, free from nettles, and nicely kept, and the tea-arbours are as snug as little birds’-nests ; open, too, only to the southern sunny sea ; and Darby and Joan sit there in unlimited enjoyment, sipping their cup of bohea, while their little ones climb about the ruins and fancy themselves wandering heroes, or fancy nothing at all but enjoyment. And

to tell you the truth, Eleanor, I suspect that could we get far enough from such a scene, to view it through the true poetic haze, we should look upon it as almost a more poetical and more touching phase of castle life than even the old knight-and-warder times. Then, too, look what an original idea even for us, to be drinking tea in a tea-arbour amidst the ruins of an ancient fortress !”

“Not a word of joke, dear aunt,” cried Eleanor. “Your picture is a real one, and there is real, real poetry about it. I fancy I see the jovial little parties you talk of, and—and— aunt, do you know, I now feel quite selfish for always thinking first and foremost of some nonsense of my own.”

“Your thoughts were natural ones in this case, my dear; that is to say,” added Mrs. Mortimer, smiling, “natural for a young lady fresh from reading Walter Scott’s Romances and Gray’s Odes. But now you perceive the truth of what I was saying before; namely, that everything, and everybody, and every place (with perhaps the one exception of Lady Charlotte Lennox’s *bête noir*, Hastings), has an interesting side to it. If you can’t see it, the fault is more likely to be in you than in the thing looked at. At scenes such as I have described, the Lady Charlotte Lennoxes of the world would turn up their pretty noses in disgust. Yet it is from scenes such as these that the Goldsmiths and Lambs gather materials for their most beautiful essays and most vivid descriptions. But I am weary, Eleanor. We have had enough of the old castle. You shall descend with me now to the town and the Parade.”

“Oh, do spare me the Parade, aunt !” cried Eleanor. “I know you are very skilful; but how can anybody make a Parade interesting? Parades, at all events, are not to my taste.”

“You are very troublesome, my dear,” remarked Mrs.

Mortimer. "But you really must go my way, and my way leads along the Parade to the fishing-boats."

"The fishing-boats, by all means, aunt."

"Very well. But the Parade lies *en route*, and let me tell you there is a great deal to be learnt there."

"Oh, about how to dress, and how to hold oneself, I suppose you mean, aunt. Pray go quick over that part. It may be very necessary to know, but it cannot be interesting."

"You are the worst guesser to-day that I ever listened to, Eleanor; I really had no thought about such matters, for I question if my Parade be a very first-rate school for such accomplishments. No, my dear child; my remembrances of what is to be learnt on the Parade are of a very different kind. Look! I shut my eyes and recollect; and now I see before me on that straight, stiff walk, two Bath chairs, drawn slowly along, one behind the other, by chairmen. And, as if it were only yesterday, I recall the pang that shot through my heart when glancing at those chairs as I passed them, I beheld in them two sisters: costume—size—age—so nearly, if not exactly the same, that it was almost impossible to distinguish the one from the other. Alas! and the same fell disease was evidently at work upon them both! It had robbed their cheeks of bloom and wasted their flesh, and sunk their large, dark, melancholy eyes. It was only on warm sunny days they ventured out, and then always together, and in that manner. I never saw father or mother with them, and they were no longer girlishly young. It was a piteous sight, and yet this was but one among many of a similar description. What do you think of my Parade now, Eleanor?"

The tears stood in Eleanor's eyes as she answered, "It must be a very melancholy place, aunt; I cannot think how you can like it!"

“I did not say *I liked it* exactly,” replied Mrs. Mortimer, now sitting upright in her chair; “but I *dislike* a great deal more the morbid fastidiousness which makes people run away from these so-called sad realities of life, as if they had nothing to do with them! Illness and death are the certain lot of all of us, at *some* period of our lives; and I really think we are shutting our eyes to what may be justly called a ‘means of grace,’ if we uniformly cross over to the other side, when any of these examples of our common mortality cross our path.”

“But you can hardly call it their crossing our path if we go to a place where we know invalids are sent, aunt.”

“Then, my dear, we must at once give up all thought of going to a fine warm climate ourselves; for wherever that great blessing is to be met with, there assuredly will you be apt to find invalids.”

“Go on, aunt, I understand. And the soft air we go to for restoration of strength, they go to for ——” And Eleanor covered her face with both her hands.

“For *Euthanasia*, Eleanor, but do not be distressed. It is but the ending of the journey we are all upon, rather sooner than usual.

“ ‘A little earlier or later, dearest,
What matters it?’* ”

“And we who live need such sights, not only to remind us of mortality, but to arouse us to gratitude for the blessing of health still allowed to ourselves. You, in the first bloom of youth and strength, may well, on looking at those fair young creatures fading away, utter a prayer of thankfulness, which would probably have been left unsaid, and even unthought,

* “Eine Minute früher oder später,
Was macht das aus?”

had not the painful spectacle before you warmed up in your heart the dim flame of gratitude. Ah! from day to day w all of us, more or less, overlook daily blessings; and of none are we much more forgetful than of health.

“My dear niece, when we think of the trivial common-places which fill our poor heads from one week’s end to another, ought we not to be really *glad* of anything which raises our ideas a peg or two higher in the scale? In short, anything which calls the hard-hearted to tenderness, the frivolous to seriousness, and all to gratitude, must be to be desired rather than to be shunned. But now I have said enough. There were many lively scenes as well as sad ones on that Parade, Eleanor. Persevering little boys with indefatigable hoops, gay ladies and gambolling children, and now and then a travelling astronomer, who, for a very small consideration, allowed you to look through a telescope at the spots on the sun. But whether the spots were on the sun, or on the glasses of his telescope, was a point very difficult of determination. Then, too, it was on the beach, close under the Parade, that any curious sights were sure to be exhibited. I remember once a huge beam of wood, three yards perhaps in length, being brought ashore covered with barnacles so thickly, that they clung to it, and hung round it, like ornamenting fringe. On another occasion there was a still greater curiosity. A large animal called a polypus,—a dreadful-looking, shapeless lump of flesh, with a number of long fleshy arms, underneath which were two rows of suckers, arranged along the whole length of the arm like buttons. If you put your finger for a moment on to one of these suckers, you felt it drawn closer in, and rejoiced in withdrawing it as quickly as possible. Report said, that the polypus had power to sink a boat, by using the combined strength of all the suckers on his arms to draw it down! At all events, the beast was a very curious and

frightful one, and was thought such a rarity, that the people who had taken him, pitched a tent for him on the beach, and charged sixpence admission to visitors, anxious to view him in his captured state, in a large tub of salt-water. Poor creature, he died after a two days' exhibition!

"Now, Eleanor, I begin to be as tired of the Parade as of the Castle. So let us move on. At one end of it you descend by a flight of steps to the beach, and at once find yourself in a different world. No more ladies, either sick or gay,—no more astronomers, nor showmen. But sailors, boats, fishmongers' stalls, nets spread out to be dried or be mended, windlasses drawn up by patient horses, men, women, and children, all busy or idle over some pursuit connected with fishing, fishing-tackle, sails, and ropes. And here I am completely puzzled what to choose for your amusement."

"You can't mean that there is nothing amusing there. If you were to say that, I couldn't believe you, aunt."

"But I said nothing of the kind. On the contrary, my difficulty is among so many interesting things, to guess which you would prefer me to talk about."

"All, aunt."

"Aye, but there is such a thing as a choice too. For instance, if you are fond of sketching, I should never get you away from those noble dark boats, built for hard seas and rough landing, and the earringed fishermen lounging about them. You would be finding more studies than a month's stay would enable you to complete, and would go into extravagant raptures over certain tall, narrow, wood-planked houses, blackened with pitch, which are run up as a shelter for the coils of ropes and sails. The effect of these slim, dark cots, when caught in contrast either with the grey cliff or the blue sky, is so remarkable, that no one with half an artist's eye could fail to remark it. To a sketcher,

therefore, I should bid good-bye for the day, if I once got one there. But how is it with you, Eleanor? shall we go on?"

"On, at all events now, though the idea of that scene would be perfectly enough to make me long to go to the place, even if it contained nothing else, and was as stupid as Hastings."

"Good! Now setting aside the picturesque appearance of these sailors, they are a very curious race. Their fathers were most of them genuine smugglers, and the sons in their early youth have shared in some of those forbidden adventures. Only mention the word smuggling, and you see such a curl of the lip and suppressed smile, as betray what a mine you are treading upon. I remember one who was out with your uncle and myself in a boat one day, whom your uncle encouraged and coaxed until he told us wonderful tales of his early days. Impudent escapes, and the landing of kegs of illicit spirits in spite of the utmost vigilance of a very vigilant coast-guard, who in one particular case fairly outwitted themselves. The man rowed us in sight of the very spot where the adventure happened. The smugglers had discovered that their intention of landing the spirits *somewhere* had been detected, so they sent off two or three decoy boats, with a few men in each, to different places where it was likely they would be expected to land, and having in this manner lured away to various places the whole of the preventive staff, they made at once for the now deserted preventive station itself, a house lying in a hollow between cliffs. And there they actually landed their booty and made their way through the preventive officers' gardens, carrying the kegs triumphantly with them into the country, and actually cutting some of the best cabbages in the garden as they passed through, as a *bonne bouche* for supper! You should have seen the sailor's grin of exultation as he related

this feat, and, despite all my loyalty and love of submission to constituted authority, I found myself so deeply interested for the fate of that smuggling expedition, that I breathed freer again when I found how satisfactorily successful it was."

"Oh, I don't wonder a bit, aunt! There is surely nothing so very wrong in smuggling, after all."

"You mean that buying and selling spirits without paying duty to the king of your country is not forbidden in the Ten Commandments?—Eh, Eleanor?"

"Well, I suppose that is what I do mean. It seems to me to be quite different from any real sin like murder."

"That is, of course, what smugglers think, and that is the argument I have heard them use in defence of their trade,—that there is nothing really wrong in it."

"Nor is there. Is there, aunt?"

"If we were solitary and not gregarious animals, I should say, no, too, Eleanor. But inasmuch as for mutual convenience and happiness we agree in living together under a social system, we are bound by the laws of that system even when they forbid our doing things not in themselves wrong; that is, not expressly forbidden by the laws of God."

"But supposing there is injustice in thus forbidding those things, or that it was a stupid error in judgment?"

"But who is to judge of that, Eleanor? Not each individual for himself, surely! All social systems consist of some who rule and others who obey. If you dislike the system under which you were born, you are no slave; you are free to go away and choose another system and other rulers. But wherever you pitch your tent, and receive the advantage and protection which a civilised social system affords you, there you are bound, in return, to yield obedience to constituted authorities and laws. If it were free to every member of a community to pick and choose which

law it suited him to obey and which to break, a nice mess we should have in lieu of a social system. Scarcely two neighbours in a street would agree in what they would obey and disobey, and the system would soon get as many black marks of disapprobation upon it as as the painter's picture."

"What was that, aunt? I have forgotten, if I ever knew."

"I think you must have heard the story; it is so old. Disgusted with the absurd criticisms of ignorant judges, an old painter once offered one of his finest paintings to public inspection, announcing that every one was at liberty to make a black charcoal cross on any part of the picture which was considered faulty and wanted correction. The room was thrown open, and the painter absented himself; but, when he returned at night, the whole picture was a mass of black charcoal crosses, not a bit of the painting could be seen! Everybody had found fault with something. If you had been the painter, how should you have felt, Eleanor?"

"In despair, I think, aunt. Among so many people there must have been some good judges. I should really suppose the picture must have had a great many faults. Do you know how the painter felt and what he did?"

"He took a handkerchief and wiped the whole of the black charcoal crosses out, Eleanor."

"My dear aunt! and did not make one correction?"

"Not one. But the next day he offered the picture to public inspection once more, requesting his kind friends, the judges, to put a white chalk cross on any part of the picture which they particularly admired, and felt sure was particularly good. I need not go on. You can guess the result, I am sure, with your lively imagination."

"Why, you don't mean, aunt——" And here Eleanor hesitated, and then laughed outright.

"Yes, I do, though. The picture was as white the

second night as it had been black the first; and so much for variety of opinion, Eleanor! I assure you, it would never answer to give up social systems, any more than pictures, to the chimerical whims of the multitude. And being bound to obey the laws of that particular social system under which we shelter and live, we certainly do sin in breaking through those laws, even when the law is not one laid down in the Decalogue. The sin may not be of that heinous character which theft and murder involve, but we must not grumble that it lays us open to temporal punishment; nor forget either, that submission to rulers is one of the virtues which our Saviour both enjoined and practised.—But, really, Eleanor, we must talk of something else. Everything makes me sleepy after a time. I am as tired now of the smugglers as I was of the old Castle and the Parade. What comes next?”

(To be continued.)

LIFE'S LESSON.

“Books in the running brooks.”—SHAKSPEARE.

UNDER the bowering honeysuckle,
 By purple bells of shaking heather,
 And brambly spines that closely buckle
 Thick-leaved chains together,
 As the sunshine plays
 Where the lily strays
 On its stream,
 Netting a gauzy maze
 Where the shingles gleam,

Flitting in cressy nook
Which the forget-me-not
King-cup and hare-bell dot,
How the glad little brook,
Sparkling along,
Singeth in joyous measure,
Toned by its own sweet pleasure,
Music's song !

Under the night's gloom, black and starless,
When the old forest-beeches near its
Darkling flood like trees are far less
Than like shadowy spirits,
Though the sunlight's gone
That so sweetly shone,
And the flowers
Died, as the night came on,
With the golden hours ;
Though the blossom and beam,
Though the love and the light
From the glamour of night
Have deserted its stream,
How the lone rill,
Chilled and forsaken — listen ! —
Makes, though no starlight glisten,
Music still !

X ?

MICE "THAT MAR THE LAND."

THERE are many kinds and species of mice in this world, and most of them when they swarm, as they are apt to do at times, become very destructive to the property of man. One of the most celebrated, beginning with the northern parts of Europe, is the Scandinavian lemming (*Myodes lemmus*), which is handsome enough, with its variegated black and yellow fur. This creature occasionally migrates, and, at such periods, countless hosts of lemmings march in a straight line, regardless of river or mountain, stackyard or barn, and devastate the country in a way that cannot be estimated in our happy lemmingless land. There is the hamster too (*Cricetus vulgaris*), a creature much larger than our rat, with pretty white feet, and a white spot on the throat and breast, its variegated yellow back contrasting with the uniform smeared black furring of the under surface. This large "mouse" hoards up grain to an extent that may be imagined, when we are told that its hole is seven feet deep, and that these holes are filled to the brim by this diligent and industrious creature. Where it is found it is generally common, and woeful are its ravages in a corn-producing district. In the "Fauna Boreali-Americana," Sir John Richardson introduces us to several species of burrowing, mouse-like rodents, some furnished with cheek-pouches,—fit receptacles for the stores of food which they carry off.

The mouse of Scripture (*âchbor*, Lev. xi. 29) was one of "the creeping things that creep upon the earth," and the name evidently seems to have included many different but allied creatures.* The "mice that mar the land" proved a

* See note to Bagster's Comprehensive Bible. In confirmation of the accuracy of this note, Mr. Deutsch, of the Library (British Museum), informs us that *akabiru* (Kam) plur. is an old Arabic word, evidently the

dire calamity to the heathen Philistines, when even "the priests and diviners" of those enemies of the Jews counselled their fellow-worshippers, to "make images" of them; "and ye shall give glory unto the God of Israel, peradventure He will lighten His hand from off you, and from off your gods, and *from off your land*" (1 Sam. vi. 5). In one of the cases of the Egyptian Gallery in the British Museum are images of a little shrew, or mouse-like animal, interesting as showing the similar religious habits of the great adjoining nation to Philistia. These images were dedicated to the god Horus.* The mouse was "unclean," and yet one of the sins in which the Jews indulged in the days of Isaiah (Isa. lxvi. 17) was in "eating swine's flesh, and the abomination, and *the mouse*." Some travellers imagine that the animal, here alluded to, must be the jerboa,—that curious rodent, with the long hind-legs, which jumps away on its flying stilts before them, as they disturb its solitude in the root-abounding plains and hills of Palestine. This creature (*Dipus Ægyptius*) is still eaten by the Arab, who stops most of its burrows, and coming at night entraps the jerboa, as it tries to escape by a hole over which he has spread a net.

Dr. Ruppell† tells us that there are many rats and mice same as *âchborim*, the plural of *âchbor*. It is the male of the *jarbuon*, the jerboa (*Mus jaculus*, Forsk = *Dipus Ægyptius* of modern authors). The word is not found in modern Arabic dictionaries. In the Arabic Bible *jarbuon* only occurs in Isa. lxvi. 17. In Lev. xi. 29, the word is *fâron*; and in 1 Sam. vi. 5, &c., it is *djuradhon*. In the Vulgate and Septuagint *mus* and *μῦς* occur in all the three places. See Walton's Polyglott. The word seems composed of two, meaning *to devour* (*araka*) or *eat*, and *grain* or *corn* (*bâr*).

* Mr. Birch has figured one of these bronzes nearly seven inches long (fig. 100) in his "Gallery of Antiquities, selected from the British Museum," p. 52.

+ "Über Saugethiere aus der ordnung der Nager," Museum Senckenbergianum, iii. 105, &c.

in Egypt: our *Mus rattus* is abundant in the houses of Cairo, where it is as "restless" as our "rotten," the "squeak" of which is so well characterised by Burns. The black rat, feelingly and often comically introduced by Mr. Waterton in his "Essays," seems to be common in the streets and canal borders of that African capital; while its larger neighbour, called by the naturalist of Walton Hall the Hanover rat (*Mus decumanus*), the brown or Norwegian rat, the most abundant in London, confines itself to corn magazines and to ships on the Nile. We may mention that "the trade" in Paternoster Row, who, from crowded storeys upon storeys of books in quires and in boards, are forced to keep some of their stock in sunk floors, have found that books are left untouched by these gentry, provided the books are so arranged as to allow the rats to run between literature and the wall. Our readers may thus learn a lesson, and need fear nothing from the literary excursions of the "restless rottens," always provided they take similar precautions with those of the prudent proprietors of Paternoster Row. Rüppell figures several members of the rat tribe in the work we have cited. Some of the species (see his *Heterocephalus* and a species of *Rhizomys*, figured on plate viii. f. 1 and 2) have most redoubtable gnawing heads. Maginus, quoted by the learned Samuel Bochart,* alludes to fields in Palestine being almost deserted, on account of the abundance of mice and shrews, which were preyed upon by some birds, so that, but for their presence, the seeds would have been quite destroyed.

The long-tailed field-mouse (*Mus sylvaticus*) is certainly the very mouse immortalised by the poet Burns, "on turning one up in her nest with the plough, November 1785."†

* "Hierozoicon," I. lib. iii. cap. xxxiv. p. 1018.

† "Poems, chiefly in the Scottish Dialect," p. 196 (1787).

The picture of the nest,—

“ O’ foggage green . . .
That wee-bit heap o’ leaves an’ stibble,
Has cost thee monie a weary nibble ;”

and the situation where the Ayrshire bard met with the

“ Wee, sleekit, cowrin’, tim’rous beastie,”

leave no doubt as to its identity.

This species is of a reddish-brown above, and white beneath; it has long ears, and a tail nearly as long as the head and body. It is scattered, observes Professor Bell,* “over almost the whole of the temperate parts of Europe, and in every part is considered as one of the most destructive of all the minor pests of the corn-field, the nursery-ground, and the kitchen-garden.” It is excessively prolific, and as each specimen lays up a good supply against winter in its retreat, the devastations which this mouse commits are almost incalculable. This food consists of acorns, nuts, corn, and various seeds and roots. Pennant says, that the chief damage done to our fields results from the swine grubbing up the ground with their sinewy noses to get at these subterranean stores.†

Notwithstanding its depredations, it is a gentle and timid little creature, which is easily tamed, and soon learns to be friendly. Professor Bell says, “I have seen several of them running out upon the breakfast-table of my late most valued friend, Dr. Leach, of whose kind and affectionate disposition they appeared to have an almost instinctive perception, as they would feed from his hand or

* “British Quadrupeds,” p. 305.

+ See “Excelsior,” vol. iii. p. 155. It is not unlikely that the boar of Syria may grub up the ground for stores of field-mice as well as for roots.

from his plate without the least fear, and allow him to handle and play with them as freely as the dormouse."

The naturalist, therefore, as well as the poet, has a word to put in for poor little *Mus sylvaticus*, whether running over the breakfast-table in his well-remembered apartments connected with "old Montagu House," in Bloomsbury—the British Museum—as it existed some ten years ago, or as starting away "wi' bickering brattle" from under Burns's plough, in a field of Mossgiel farm in Ayrshire, with its

" Low roof with green trees half concealed,
 the very field
 Where Burns ploughed up the daisy."

(WORDSWORTH, v. p. 243.)

How true, and affectionate, and simple, are his reflections!—

" I'm truly sorry man's dominion
 Has broken Nature's social union,
 An' justifies that ill opinion
 Which makes thee startle,
 At me, thy poor, earth-born companion,
 An' fellow-mortal!"

A few lines, teeming with incident, with description, and with moral, expressed, too, by a manly and keen-eyed observer of nature, may help to decorate the more hard, though not less matter-of-fact compilation of the naturalist,—

" I doubt na, whyles, but thou may thieve ;
 What then ? — poor beastie, thou maun live !
 A daimen-icker in a thrave*
 'S a sma' request :
 I'll get a blessin' with the lave,
 An' never miss 't !"

Familiar though the majority of our readers may be with Burns's lines, there are some to whom they may be comparatively unknown, and for their sake, and to please those

* "Daimen-icker,"—an ear of corn now and then.

who have sympathy in any measure with a mind which "welled up" with kindly feeling to every animal and plant around him, we venture to quote the last stanza, but one, of that little masterpiece,—

" But, mousie, thou art no thy lane,
 In proving *foresight* may be vain :
 The best-laid schemes o' *Mice* an' *Men*
 Gang aft a-gley,
 An' lea'e us nought but grief an' pain,
 For promis'd joy."

We have, in our land, another exceedingly destructive field-mouse, belonging to the same genus as the water-rat. It is a round-muzzled creature, with a short hair-covered tail and little round ears, and has altogether a neat and not very "mouse"-like aspect. Naturalists name it *Arvicola agrestis*. This creature, which occasionally becomes very abundant, is one of the most destructive enemies against which the farmer and storekeeper of corn have to battle. Professor Bell remarks, that "whilst the field-mouse confines itself principally to drier situations, the present species frequents meadows and damp pastures." It does not, however, restrict itself to such places. "After having followed the labours of the reaper, and taken their share of the harvest, they attack the newly-sown fields, burrowing beneath the surface, and robbing the husbandman of his next year's crop; and at length retreating to the woods and plantations, commit such devastations on the young trees as would scarcely be credible, were not the evidence too certain to be doubted."*

Our admirable friend, Edward Jesse, Esq., late Surveyor of Her Majesty's Woods and Forests, an able observer of animals and their instincts, and a graphic describer of their habits, has given, in the first series of his "Gleanings," an

* "British Quadrupeds," p. 326.

excellent account of their ravages, from which we will make an extract, referring our readers for further particulars to the valuable and entertaining volume itself:—

“ An extraordinary instance of the rapid increase of mice, and of the injury they sometimes do, occurred a few years ago in the new plantations made by order of the Crown in Dean Forest, Gloucestershire, and in the New Forest, Hampshire. Soon after the formation of these plantations, a sudden and rapid increase of mice took place in them, which threatened destruction to the whole of the young plants. Vast numbers of these were killed, the mice having eaten through the roots of five-years' old oaks and chestnuts, generally just below the surface of the ground. Hollies also, which were five and six feet high, were barked round the bottom; and in some instances the mice had crawled up the tree, and were seen feeding on the bark of the upper branches. In the reports made to the government on the subject, it appeared that the roots had been eaten through, wherever they obstructed the runs of the mice, but that the bark of the trees constituted their food. This was ascertained by confining a number of the mice in cages, and supplying them with the fresh roots and bark of trees, when it was found that they fed greedily on the latter and left the roots untouched. Various plans were devised for their destruction; traps were set, poison laid, and cats turned out, but nothing appeared to lessen their number. It was at last suggested, that if holes were dug, into which the mice might be enticed or fall, their destruction might be effected. Holes therefore were made, about twenty yards asunder, in some of the Dean Forest plantations, being about twelve in each acre of ground. These holes were from eighteen to twenty inches in depth, and two feet one way by one and a half the other; and they were much wider at the bottom than the top, being excavated or hollowed under, so that the animal, when once in, could not easily get out again. In these holes at least 30,000 mice were caught in the course of three or four months, that number having been counted out and paid for by the proper officers of the Forest. It was, however, calculated that a much greater number of mice than these were taken out of the holes, after being caught, by stoats, weasels, kites, hawks, and owls, and also by crows, magpies, jays, &c. The cats also, which had been turned out, resorted to these holes, to feed upon the mice; and in one instance, a dog was seen greedily eating them. In another, an owl had so gorged himself, that he was secured by one of the keepers. As the mice increased in number, so did the birds of prey, of which at last there were an incredible number. In addition to the quantity above mentioned, a great many mice were destroyed in traps, by

poison, and by animals and birds of prey : so that in Dean Forest alone, the number of those which were killed in various ways could not be calculated at much less than 100,000. In New Forest, from the weekly reports of the Deputy surveyor of the Forest, about the same number were destroyed, allowing the same calculation for those eaten by vermin, &c. : in addition to which, it should be mentioned, that these mice were found to eat each other when their food fell short in winter. Buffon mentions this circumstance, and adds, that they not only devour the smaller of their own species, but also another description of mice which he calls *campagnols*. Putting these circumstances together, the total destruction of mice in the two forests in question would probably amount to more than 200,000. This calculation is made from official weekly returns and other correspondence, and will show the enormous increase of these animals in a few months, as their depredations and destruction were equally sudden."*

The farmers, too, near Liege, according to M. Selys Longchamps, make round holes, about four inches in diameter and a foot deep, and in this way many are caught and destroyed.

The field-vole fights desperately, if confined with his mates and supplied with "short commons." At such times the weaker are eaten by the stronger. It burrows and takes possession of the burrows of the mole and other animals. In winter its sagacity leads it often to take up its quarters in barns or wheat-ricks. Should the season be dry, numbers of field-voles perish. The nest of the female is formed of dried grass, but it is not like the "most artificially platted" beautiful nest of the little harvest-mouse (*Mus messorius*), described by the naturalist of Selborne. This nest is "composed of the blades of wheat, perfectly round, and about the size of a cricket-ball, with the aperture so ingeniously closed, that there was no discovering to what part it belonged. It was so compact and well filled, that it

* "Gleanings in Natural History, with Local Recollections, by Edward Jesse, Esq." London, 1832, pp. 175-177. There were two species found, the *Mus sylvaticus* and the *Arvicola*.

would roll across the table without being discomposed, though it contained eight little mice that were naked and blind. . . . This wonderful procreant cradle, an elegant instance of the efforts of instinct, was found in a wheat-field suspended in the head of a thistle.* This nest is occasionally brought to London with its inmates, and it is curious to notice the power which the little creature has of winding its tail round a stem or stalk, so as to help it in its progress upwards or downwards,—a faculty not possessed, that we know, by those domestic species of the group which are “pussy’s mortal foes.” Chapters might be written, and volumes have been written, filled with descriptions of the various and numerous members of the family of mice. Who does not admire the prettily marked Barbary mouse, sometimes kept in cages in this country, notwithstanding its peculiar *murine* smell? The little harvest-mouse is also occasionally petted; and children, in London at least—so various are tastes—are very fond of white mice. It is astonishing how much mischief rats and mice must do in a city of two-millions of inhabitants; when in Paris, once on a time, the inhabitants of a district prevented the removal of slaughtering-houses, favourite resorts of rats, lest their own dwellings should be inundated by an invasion about as terrible and distressing as that of any enemy. We, who have no lemmings or hamsters, but only rats and mice, do not sufficiently know our privileges.

A. W.

* “Natural History of Selborne, by Gilbert White.” Letter XII. Nov. 4, 1767, p. 33 (1789).

LIFE, IN ITS HIGHER FORMS.

No. III. (*continued.*)

REPTILES.

THERE may often be seen on sunny banks at this season of the year, basking in the genial beam of noon, a little Reptile, well known under the appellations of Blind-worm and Slow-worm. As it lies motionless, you might almost fancy it a foot's length of thick iron wire, slightly polished, for it is almost equal in thickness in every part, and its surface gleams with a metallic lustre in the bright sun. Here is the village apothecary coming up the lane, poring over a book with spectacles on nose; let us ask him if he can tell us anything about it. "O yes! it is the *Anguis fragilis* of Linnæus!" and he passes on. Oh! the Brittle Snake! for such is the English of those two Latin words.

But here is Hodge the hedger: perhaps from his occupation he may have some acquaintance with the bit of dingy wire: what say you, Hodge? "'Tis a Zneak, dang 'un!" and he makes a spiteful blow with his stick across the back of the poor animal, with the apologetic asseveration, "'Tis a deadly pizon varmin!" But see, the blow has effectually demolished it, and that in a strange manner; for, as if it had been made of glass, it has snapped across in four or five places; and we at once perceive the propriety of one of its Latin appellations, that of "*fragilis.*"

Science and ignorance agree, then, that the Slow-worm is a Snake; but science and ignorance are both mistaken, for the creature is a *Lizard*. The assertion seems paradoxical, when we think of the two pairs of well-developed limbs, each armed with five jointed and clawed toes, that

the Lizard possesses, and of the way in which it uses them to scamper away from our intrusion beneath the heath and furze; but it is true that the slender, limbless, snake-like Slow-worm is, in all the most important points of its anatomy, a Saurian, and not a Serpent. Undoubtedly it is one of the links by which these two very diverse forms are bound together, and, like all such links, forms a most interesting subject of study. The degeneration and gradual disappearance of the limbs, in the progress of the various genera that, like so many stepping-stones, bridge over the wide passage from the Lizard to the Serpent, are phenomena peculiarly worthy of observation; and we cannot do better, in bringing them before our readers, than to quote the words of the eloquent historian of "British Reptiles," in his account of this very Slow-worm:—

“From the well-known family of the *Scinks*, or *Scincidæ*, with their true legs and five-toed feet, down to the present species and its immediate congeners, every possible gradation is to be found in the development of the interior and posterior extremities. Agreeing, as they all do, in the Saurian character of the structure of the head, the consolidation of the bones of the cranium and jaws, and the narrow and confined gape, so different from these parts in the true Serpents, they yet approach the latter in the comparative length of the bodies, and in the gradual diminution and ultimate disappearance of the extremities. In the genus *Scincus*, for instance, the limbs are already less robust than those of the true Saurians; the two pairs are also more distant from each other, in consequence of the greater comparative elongation of the body. There are as yet five perfect toes on each foot, which, however, are shorter and more even in their relative proportions than in the true Saurians. These deviations become increased in the genus *Chalcides*, and still more in *Seps*, which has a very

elongated body, the limbs extremely small, and the toes only four or three on each foot. In *Monodactylus* a further reduction takes place in the development of the limbs, which have dwindled to a mere little undivided finger; they are still, however, four in number; but in the genus *Bipes* the anterior ones have wholly disappeared, and are found in a rudimentary state under the integument, the posterior ones constituting only small undivided processes. These also being removed, the Ophidian form of the present genus, and those of *Tortix*, *Typhlops*, and others, with all the *Amphisbænidaë*, succeed, in which the bones of the shoulder, the sternum, and the pelvis, exist in a more or less rudimentary condition, and lead us towards the true Snakes, in which all these parts are lost, excepting the rudiment of a posterior extremity, which in the *Boa* appears externally in the form of a small horny hook, or holder, on each side of the vent.*

Besides the Slow-worm, we have in the British Isles but two representatives of the vast Lizard group,—the Order *Sauria*. One of these is the elegant Sand Lizard of our sandy heaths (*Lacerta agilis*), which is beautifully marked along the sides with eye-like spots, and sometimes occurs of a rich variegated green hue. The other is the smaller, but more common Viviparous Lizard (*Zootoca vivipara*), whose interesting peculiarity is expressed in its name, that of producing a living progeny, most Reptiles laying eggs. The difference between these two conditions is, however, less important than it at first appears; for there is every reason to believe, that in this case, as well as in that of the Viper (*Pelivus berus*), which is also viviparous, the egg-covering, which is merely a parchment-like membrane, and very thin, is ruptured in the act of parturition.

The most remarkable genus in this Order, and indeed

* “British Reptiles,” p. 40.

in many respects the most extraordinary and anomalous of all Vertebrate animals, are the Chameleons, of fabulous and poetic celebrity. They are Lizards inhabiting trees in the warmer countries of the Old World, with a great development of head, and a shagreened skin. As the Monkeys of South America are fitted for their arboreal habits by grasping hands and a prehensile tail, so is the Chameleon, by a curious modification of the common Lizard organization. The toes are five, as in the majority of Saurians, but these are arranged in two sets, three in one set and two in the other, each set being enveloped in the common skin as far as the claws. These two parcels of toes are opposed to each other, and thus each foot forms a true grasping hand, and is used in the manner which this structure indicates; the Chameleon moving with slow and deliberate steps, always grasping with a firm hold the branch on which it is creeping, before the other feet are relaxed for a fresh step. The tail is round and prehensile at the tip, like that of the American Monkeys; its under surface is roughened with small granulated *papillæ*, as is that of the toes also, probably in order to the more delicate perception of the surface grasped. The tongue affords an analogy to the same organ in the Woodpeckers, no less singular than that of the feet; for though ordinarily concealed within the mouth, it is capable of being darted forward at its insect prey, and, being furnished with a glutinous secretion, secures it by its adhesiveness.

A most extraordinary aspect is communicated to these Reptiles by the structure and movements of their eyes. In the first place, the head is enormous, and being three-sided with projecting points and angles, makes a sufficiently uncouth visage; but the eyes which illuminate this notable head-piece must, indeed, to borrow for the nonce the phraseology of Barnum, "be seen to be appreciated."

There is on each side an immense eye-ball, full and prominent, but covered with the common shagreened skin of the head, except at the very centre, where there is a minute aperture, corresponding to the pupil. These great punctured eye-balls roll about hither and thither, but with no symmetry. You cannot tell whether the creature is looking at you or not ; he seems to be taking what may be called *a general view* of things ;—looking at nothing in particular, or rather, to save time, looking at several things at once. Perhaps both eyes are gazing upwards at your face ; a leaf quivers behind his head, and in a moment *one eye* turns round toward the object, while the other retains its upward gaze ; presently a fly appears, one eye rapidly and interestedly follows all its movements, while the other leisurely glances hither and thither, or remains steady. Accustomed as we are to see in almost all animals the two eyes move in unison, this want of sympathy produces an effect most singular and even ludicrous.

The Lizards are not in all cases the little leaping, timid, playful creatures that we commonly associate with the name. The aquatic Monitors (*Varanidæ*), of both continents are truly formidable. M. Leschenault de Latour saw one attack a young stag as it attempted to swim across a river, striving hard to drown it. The deer was too active on this occasion, but the same zoologist found the thigh-bone of a sheep in the stomach of one that he dissected. The tail in this group is very muscular, and is compressed throughout its length ; it thus forms a powerful swimming organ, especially as its upper edge is frequently surmounted with a crest of flattened elevated scales. These large and powerful Lizards, which are often five feet in length, and stout in proportion, usually endeavour to overcome their prey by dragging it into a river and drowning it.

In all these particulars we see an approach to those

mighty tyrants of tropical rivers, the Crocodiles, which have been celebrated from remotest antiquity as the very impersonation of bestial power and ferocity. The noble description of Leviathan in the book of Job,—the climax of those majestic interrogatories wherewith Jehovah withered the pride of his too audacious servant,—is a picture of one of these Reptiles, drawn from the life by the master-hand of Him who made it.

“Who can open the doors of his face? his teeth are terrible round about. His scales are his pride, shut up together as with a close seal. One is so near to another, that no air can come between them. They are joined one to another, they stick together, that they cannot be sundered. By his neesings a light doth shine, and his eyes are like the eyelids of the morning. Out of his mouth go burning lamps, and sparks of fire leap out. Out of his nostrils goeth smoke, as out of a seething-pot or caldron. His breath kindleth coals, and a flame goeth out of his mouth. In his neck remaineth strength, and sorrow is turned into joy before him.

“The flakes of his flesh are joined together: they are firm in themselves; they cannot be moved. His heart is as firm as a stone; yea, as hard as a piece of the nether millstone. When he raiseth up himself, the mighty are afraid: by reason of breakings they purify themselves. The sword of him that layeth at him cannot hold; the spear, the dart, nor the habergeon. He esteemeth iron as straw, and brass as rotten wood. The arrow cannot make him flee: sling-stones are turned with him into stubble. Darts are counted as stubble: he laugheth at the shaking of a spear. Sharp stones are under him: he spreadeth sharp-pointed things upon the mire.

“He maketh the deep to boil like a pot; he maketh the sea like a pot of ointment. He maketh a path to shine

after him; one would think the deep to be hoary. Upon earth there is not his like, who is made without fear. He beholdeth all high things: he is a king over all the children of pride.”—JOB xli. 14–34.

The most prominent characteristics of the Crocodile of the African rivers are here distinctly painted. The impenetrable nature of the integument, a sort of surface-bone; its arrangement in strong square scales, set firmly edge to edge, one against another in close array; the peculiar fiery glare of the eyes; and above all, the serried teeth, which, to the number of thirty or more on each side of each jaw, are never concealed by lips, giving to the animal, even when tranquil, the terrific appearance of a grinning rage,—are all points that scientific naturalists have dwelt on in their descriptions of these monsters. When we remember that they are among the most gigantic of all animals, far exceeding the Elephant, the Crocodile of the Nile being asserted to attain a length of twenty-five feet—we shall acquiesce in the propriety of the concluding epithet,—“King over all the children of pride.”

If space in “Excelsior’s” valuable pages permitted, we should delight to trace the transition, through the fierce *Chelydra* of Florida, from the Crocodiles to the Tortoises. But we must be content with directing our readers’ attention to the contrast which subsists between one of these latter, enclosed as it is in an immoveable box of bone, with only an opening in front at which to poke out its head and hands, and a similar hole behind for its tail and hind limbs, waddling along with painfully slow and heavy tread;—the contrast, we say, between such a creature and the lithe Snake, the very type of flexibility, altogether destitute of limbs, yet shooting along with an undulating velocity that the eye of the gazer can scarcely follow.

P. H. G.

PIONEERS AND FIRST-FRUITS.

MORRISON IN CHINA.

CHINA contains a third of the human species. Nothing can be sooner said; few things are harder to realise. But some standards of comparison may help us. Taking our own country as the measure, the population of China would fill England and Wales twenty times over, and Scotland 120 times. If a book is published in the English language, including the inhabitants of the old world and the new, there are probably fifty millions of persons who, if they possessed the art of reading, would be able to peruse it; but when a book is published in Chinese, it commands a range of readers seven times greater: that is to say, for one person who can read the "Paradise Lost" and "Bacon's Essays," there are seven who can read Mencius and Confucius in their native tongue. If the population of London be two millions and a half, and if an attempt were made to supply every citizen with a copy of the Scriptures, could the distributor prevail on the whole to pass in single file before him, by working ten hours a-day for six days in the week, and giving away at the rate of 1000 Bibles per hour, in the course of less than ten months every Londoner would be supplied with the Word of God; but at the same rate it would require 120 years to supply every Chinaman: were the distribution now begun it would not on that plan be ended before A.D. 1976. There is another and a very solemn way of putting it: out of every three deaths which occur, one occurs in China. Of the three accountable and immortal beings who last passed into the presence of their

Maker, it may be assumed that one came from the Chinese Empire.

Not only are the Chinese exceedingly numerous, but physically and mentally they are a superior race. Tartar domination, with its Gorgon eye, has petrified their civilisation into something very stiff and stupid-looking; and with its cold metaphysical selfishness, and its absence of a God holy, benign, and ever ready to hear and answer prayer, the religion of China has made its people cunning, rapacious, deceitful, sensual, and heartless. But they have great capabilities. With their muscular frames and great tolerance of fatigue, they are industrious, and, when opportunity is given, they are very enterprising. And although we laugh at their noisy arrogance and great swelling words, we must concede their intelligence. Inventing for themselves paper, gunpowder, book-printing, the compass, spectacles for aiding feeble vision, and many of those appliances which have immortalised the sages of Europe, their civilisation is of much earlier date than ours. At a period when the nations of Europe felt interest in little except mutual slaughter; when every castle on the Rhine was a robber's den, and the very barons of England were little better than high-born ruffians; the Chinese were pursuing the arts of a peaceful culture; were intersecting their "flowery land" with canals and elaborate highroads; were building porcelain pagodas; were suspending in the air gardens full of delicious fruits and rare exotics; were manufacturing the most exquisite fabrics of silk and cotton, as well as objects ingenious or beautiful in ivory, silver, and stone. It is only within the last generation that the descent of solid bodies, or meteorites, from the firmament, has become a recognised fact among the learned; but it is a remarkable circumstance, and shows the early intelligence and observant habits of this singular people, that for centuries a

careful registration of every aerolite has been kept throughout the empire by command of the Chinese Government.

Populous and interesting as this empire is, it was almost unknown to Britain at the commencement of the present century. A few had read the travels of Marco Polo, and Macartney's Embassy had attracted some attention, and for commercial purposes ships and merchants traded to Canton and Macao; but in as far as they influenced the thoughts and actions of most British Christians, that portion of Adam's family might as well have had their dwelling in the moon. Sir George Staunton was the only Englishman acquainted with the language, and there was a prevailing impression that the speech as well as the territory of this mysterious people effectually debarred the stranger's entrance. It was not till the year 1807 that the first Protestant missionary found his way to China.

Robert Morrison was born at Morpeth, January 5, 1782; but his parents left it soon afterwards, and Newcastle was the home of his youth. His father, who was a Scotchman by birth, and a last-maker by trade, was a God-fearing man, and an elder in the High Bridge Meeting. He brought up his family very strictly, taking pains to teach them the Shorter Catechism, and encouraging them to commit the Scriptures to memory. In his boyhood Robert could repeat such difficult portions as the 119th Psalm without a single mistake. But it was not till his seventeenth year that he felt the grace of God in truth. At that period his conscience effectually awoke. He felt his guilty state before God,—was haunted with the dread of everlasting damnation,—broke off from his loose companions,—and from the usual levity of youth showed a change to the solidity and sobriety of one who lived under the powers of the world to come. Along with this change sprang up an earnest desire

for self-improvement. In order to secure time and quiet he had his bed removed to the workshop, and although he had to labour from twelve to fourteen hours a-day, he contrived to teach himself various branches of useful knowledge. And in days long subsequent he used to revert, as one of the most hallowed periods in his history, to the Saturday nights when the week's work was ended, and the carpenter's shop was swept out and prepared for the little prayer-meeting which used to assemble in it: the same humble Bethel serving as a study and an oratory, when the Sabbath hours were passed in reading Hervey's "Meditations," Henry's "Commentary," and the "Missionary Magazine." The upshot was that a desire to enter the Christian ministry began to dawn in his mind. He was received as a pupil at Hoxton Academy, and after continuing there a year his thoughts so turned to missions among the heathen, that he was transferred as a student at the Missionary College under Dr. Bogue of Gosport.

Having devoted himself to the service of the Lord Jesus, it was the prayer of the young student that He would station him in that part of the missionary field where the difficulties were greatest, and to human appearance the most insurmountable. It was not long before that prayer was answered. Chiefly through the representations of the Rev. W. Moseley, the attention of the Directors of the London Missionary Society had been turned to China. They resolved to make an effort. They asked young Morrison to go. He hailed the invitation with joy. At first he tried to induce some of his young brethren to accompany him, but, failing in securing an associate, he prepared to go alone. And at once, with the same vigour of spirit and strength of will with which he had mastered Latin in the carpenter's shop by redeeming the hours from slumber, he set about obtaining the necessary qualifications. The fifteen months which inter-

vened he spent in London studying medicine, astronomy, and departments of science likely to be useful hereafter; and with admirable industry he copied in the uncouth Chinese character a MS. of the Acts and Pauline Epistles which he found in the British Museum, and a Latin and Chinese Dictionary which was lent him by the Royal Society. Having obtained an introduction to Dr. Hutton, the Astronomer Royal, he used to walk down from his lodgings in Bishopsgate Street to the Observatory at Greenwich, carrying with him all the instruments required for making observations, and reading the whole of the way. It is also well to record, as showing that the prospect of a remote and boundless sphere elsewhere did not make him blind to opportunities at his own door, that it was through his instruction that the servant in the house where he lodged was brought to a saving knowledge of the Gospel, and soon afterwards died rejoicing in hope of eternal life.

In January 1807, Mr. Morrison was ordained in the Scotch Church, Swallow Street, and immediately set sail for New York. The East India Company at that period would not allow any missionary to set foot in their territories, and it was believed that they would throw obstacles in the way of a British subject proceeding on an evangelistic errand to China. He therefore deemed it expedient to place himself under the protection of the American flag, and for this purpose in the first instance sought the United States. At that period a departure like his was regarded as an exile for life, and in the journal which records his leaving the Isle of Wight he says:—

“ It was in much probability the closing prospect of a land that I shall visit no more. O! may the blessing of Heaven rest upon it. ‘ England, with all thy faults, I love thee still.’ I love the land which gave me birth, that to this hour has nourished me—the land of my fathers’ sepulchres—a land that God has delighted to honour; and, a circumstance

which renders it superlatively dear, there his saints in numbers dwell. May the candlestick—the glorious Gospel—never be removed from thee. Should I be ashamed to acknowledge that the silent tear, unseen, stole down my cheek, as the summit of the distant hill, mingling with the clouds, receded from my view? and, the eye unable to distinguish it, that the endearments of maternal care—my father's house—beloved friends and Christian society—objects and delights to be seen and enjoyed no more, rushed in upon my mind, and cast a momentary damp over my spirits?"

So it is. The Gospel softens the heart and intensifies the natural affections; and it is only men of warm hearts and strong feelings who, humanly speaking, are fit to be evangelists,—fit, that is, to exert a softening, melting influence on the minds of others. To such men, however, the trial of forsaking house and parents, and brothers and sisters, for Christ's sake, is peculiarly severe: but it is undergone every time that a Protestant missionary goes far hence to the heathen; and it is compensated every time that he can add, as Morrison added, "But there is a better country than that from which I have gone out. I believe its existence, and I hope I have there an inheritance. I go not to the East to make my fortune; my fortune is made. I trust that the Lord God Almighty has constituted me a joint-heir with Jesus Christ, and that in a few years he will put me in possession of the rich estate."

And so he proceeded on his way,—a man whom the Spirit of God had moulded for his work; a grave, earnest man, with strong feelings, but too proud to show them; with a mind naturally firm and self-reliant, and more apt to take counsel with himself and with God than with his fellow-men; not affable, but civil; capable of vast and continuous application, with an excellent bodily constitution, a good memory, a high purpose, and great faith in God.

And so, Mr. Morrison," said a sarcastic merchant in New

York, "you expect to convert the Chinese empire?" "No, sir," said Morrison; "I expect GOD will."

The first night of his stay in New York he was placed in the apartment usually occupied by his host and hostess, where in a crib their little child had already gone to sleep. Awaking in the morning, she turned as usual to talk to her mother; but seeing a stranger where she expected to find her parents she roused herself with a look of alarm, and fixing her eyes steadily on his face she inquired, "Man, do you pray to God?" "Oh, yes, my dear!" was the reply, "every day: God is my best friend." She then laid her head on the pillow, and fell asleep.

In the autumn he reached Canton, and as far as he knew he was the only Christian there. His prospects were by no means cheering. Betwixt the jealousy of the Portuguese priests at Macao, the dislike and contempt of the European traders, and the probable enmity of the Chinese, his position was very precarious. It was even difficult to find any native willing to teach him the language; for, curiously enough, in their proud monopoly of all good things, "the inner people" deemed it a crime to teach a stranger the Chinese tongue, or to sell to him Chinese books. But by prudence, and taking advantage of Chinese cupidity, the new-comer soon overcame every obstacle; and at the end of two years, such was his proficiency in Chinese literature, that he was appointed translator to the East India Company,—an appointment which, if it taxed his time, at least materially fortified his position, and increased his opportunity of serving that people whose welfare had brought him from the ends of the earth.

The spiritual dreariness of his position is forcibly described in a letter to England five years after his arrival:—

"Yours is a happy land. It abounds with all the means of instruction, edification, and comfort, which a Christian can desire. Far different

are our circumstances. You do well to write much and often. This day you look around you, and can rejoice in thousands on thousands assembled to praise God, and hear of His great salvation; but here are millions wandering as sheep without a shepherd. None cares for the soul of his brother, and few for their own, and those few wander in the gloom of ignorance. Fears and hopes they have respecting an hereafter: their fears visionary; the foundation of their hope the observance of some rite, or the repetition of some prayer thousands or millions of times. They are wedded to their idols. A stock, or a stone, a clay image, a picture, they consecrate as the representation of Deity, and fall down and worship it. The poor, the sick, the distressed, the dying, the unfortunate, the prosperous,—all have respect to the idols of their own forming. How desirable, yet how ill-received a duty, to point out to them ‘a more excellent way!’ Your now highly-illuminated country was once equally dark. The light of ‘the glorious Gospel of the blessed God’ has cleared away the darkness, and shed around you a flood of day. Though many amongst you shut their eyes against the light, thousands rejoice in it.”

Warfare is not so simple an affair as civilians are apt to imagine. It is not enough to land an army on a hostile shore, but it must be accompanied by ship-loads of tents, and guns, and stores; and it is not enough for the attacking force to run up to the fortification in order to seize it at once, but they must sit down at some distance, and entrench themselves, and throw up breastworks, and open lines, and zigzags, and parallels, and get their guns into position. And somewhat similar is the mode of procedure in a great missionary enterprise—in a grand evangelistic invasion, such as that of which Morrison was the pioneer. It was not enough for him to land on the wharf at Canton or Macao, and at once open his lips to a crowd of willing or wondering natives. In the eyes of these natives he was odious as a foreigner, and contemptible as a barbarian. Before he could approach them with any advantage it was needful to get the key of the position,—it was needful to propitiate individuals, at least; and it was needful to make himself master of Chinese opinions, prejudices, and modes

of thought. Above all, it was needful to command their awful and sphynx-like language, and acquire an idiomatic fluency in a tongue which scarcely one of all his countrymen had ever wielded. But Morrison was not content to be wise for himself. In conquering the language for his own use, he determined to leave the gate open for his followers. Accordingly, with incredible drudgery, besides publishing a Chinese grammar, he toiled on year after year at the most arduous work in which a scholar can engage—the preparation of a lexicon; and at last, in six great quartos, and at an expense of 15,000*l.*, the East India Company published that great monument of missionary scholarship and chief magazine of Chinese learning,—Morrison's Chinese Dictionary. It was completed in 1821.

Simultaneously with this gigantic work, he was engaged in a more congenial task,—the translation of the Scriptures. In this he had for his coadjutor the Rev. W. Milne, by whom he was joined in 1813; but 39 of the 66 books of the Bible were entirely Dr. Morrison's own translation.

Next to his piety and his devotion to China, the most admirable characteristics of Dr. Morrison were, his strong sense and his industry. The former preserved him from everything like exclusiveness and fanaticism. "Our venerable friend," he writes, "seems to underrate books as a means of converting the heathen nations. I see no occasion for this jealousy: our Saviour uses, I think, various means. Missionaries, and books, and colleges also are useful; though none of the means of salvation are without their defects. Books lie unheeded; missionaries become careless or immoral; colleges degenerate: where is there perfection on earth?" Such was his industry that, when engaged on the Dictionary, he tells his family that they need not send the newspapers, as he has not time to read them.

At last, in 1824, and after an absence of seventeen

years, he paid a visit to his native land. Full of enthusiasm for his adopted country, he brought with him a Chinese library of 10,000 volumes, and fondly hoped that some university might be induced to found a chair of Chinese literature. And assuredly he himself was received with the warmth of which he was worthy. Noticed by the King, visited by learned men, and met with tears of affectionate admiration in Christian assemblies, the day when he made his appearance on the platform of the Bible Society, with the Chinese Scriptures in his hand, will long be remembered as a memorable incident in the history of modern evangelisation.

After two years' absence, Dr. Morrison returned to China; where at last, after the toils of a quarter of a century, he rested from his labours, August 1, 1834.

Half-a-century has not elapsed since Morrison set foot on Chinese soil, and, unfurling the banner of the Cross, took possession in the name of Prince Immanuel. For many years he was a solitary labourer: now there are nearly a hundred European and American agents at work. When he arrived, there did not exist so much as a tract fit for distribution among the natives: now there are not only numerous tracts and religious books, but admirable versions of the Scriptures carefully revised, and funds subscribed sufficient to send into circulation a million copies. For seven years he prayed, and conversed, and exhorted, without knowing of a single convert; now no year passes without accessions to the Church, and many of these converts so able and so earnest, that at least fifty of them are engaged in the work of evangelising their countrymen. All throughout his life so jealously was China guarded, so sacred was its soil, so supercilious were its citizens, that there was only one spot where a European dared to land; and whilst a special ambassador from Britain was driven

from the capital ignominiously, and without so much as an audience, no Chinaman cared to quit his own self-contained and self-sufficing country. But since Dr. Morrison entered into rest five at least of the imperial ports are a safe residence to any Englishman, and even one small fragment of the soil is British territory; whilst—to say nothing of individuals who in Europe or America have mastered our Western learning—in the West Indies, California, and the Australian gold-fields, tens of thousands of Chinese adventurers are acquiring wealth and are learning new ideas. And although it would be extravagant to ascribe all these changes to Dr. Morrison or any man, it is well to note the contrast for the encouragement of those who lead a forlorn hope in the Christian army, and in order to fill our own minds with a sense of responsibility. Now that China is open, it can hardly be said that any door is shut; and now that the door of China is open, it would be very mournful if the Church of Christ did not enter in, or if, through lack of prayer or promptitude, we allowed it to be closed again.

Before Dr. Morrison left China for England, he ordained as a native evangelist a convert of Dr. Milne, named Leang-Afă. This good man laboured among his countrymen with much diligence for thirty years, and was the means of bringing to the faith not a few. In 1834, at an examination of literary aspirants in Canton, Leang-Afă distributed a tract containing an outline of the Christian religion. A copy fell into the hands of a student on whom it made a great impression, and who fourteen years afterwards came to Mr. Roberts, a missionary at Canton, seeking further instruction. Mr. Roberts regarded him as rather visionary in his religious views, and ere long the inquirer disappeared. It turned out that he had gone to the Kwang-si province, and there proclaimed his views of Christianity. Many of

the people joined him in his denunciation of idolatry, and some of them being seized and imprisoned their neighbours took arms. Under the leadership of the catechumen, who is known as Hung-tse-suen, the insurgents soon mustered so strong, that army after army which was sent to crush them was defeated and dispersed, till, with its twofold declaration against idolatry and against the Tartar dynasty, the insurgent force grew strong enough to carry all before it, and take the city of Nanking. Whatever errors and illusions may be mixed up with the movement, there can be no doubt that it includes within itself a moral reformation as well as a patriotic revolution. The one living and true God is their only object of worship, and their progress into new regions may be known by the fragments of huge wooden idols and the detritus of pagodas floating down the rivers. In their camp daily worship is observed, and the Sabbath is kept with great sacredness. They are fond of singing hymns, some of which conclude with the doxology to the Father, Son, and Spirit. The Ten Commandments are their code of morals; and so strict is their temperance, that opium and tobacco are absolutely prohibited within the patriot camp. Whether the revolution shall eventually succeed, or whether in its present form it is destined to roll back and subside, there can be no controversy as to the wholesome shake which it has given to the long-stagnant mind of that mighty population; and even as it is, Leang-Afā's tract and the Chinese insurrection are one of the most remarkable examples of a great tree springing from a little mustard-seed. H.

LUCIFER-MATCHES.

INSIGNIFICANT as the object of our history may appear, we believe our readers will find, that neither the Locomotive nor Ocean Steamer, the Electric Telegraph nor Photography, presents a more interesting chapter in the progress of civilisation than the Lucifer Match, which meets us at every turn in social and domestic life, playing its important part alike in the palace and the cottage.

From the rude plan, in use among the most ancient nations or savage tribes, of producing *fire* by rubbing dry sticks together, down to our prompt and responsive lucifer, we will find a gradual development of the attempt to procure *instantaneous light*, while each step will show how slow and laborious has been the progress.

We cannot resist the temptation to allow St. Pierre to describe the ancient plan as once practised in the West Indies.

The Dry Stick.—"With the sharp edge of a stone, Paul made a small hole in the branch of a tree, that was sufficiently dry, which he fixed firmly between his feet, and he then employed the stone to shape into a point another piece of wood equally dry, but of a kind differing from the former. He next placed the pointed wood in the hole which he had provided, and made it to turn rapidly between his hands like a chocolate-mill, and in a few minutes he had smoke and spark issuing from the place of contact; then collecting dry plants and sticks, he lighted a fire at the foot of the palm-tree."

Even the Romans employed no better method, as we learn from Pliny; though the use of the flint and steel must

have been known in some form from the expression which Virgil uses when speaking of the "fire hidden in the veins of flint,"—

" Semina flammæ

Abstrusa in venis silicis."

The earliest improvement on this rude plan was the *Flint and Steel*,—Which remained for many centuries the only method in common use; and the Saxon *Fyr-stan* and steel with tinder-box have descended even to our own day, which will remind some among us of loss of temper on sundry dark mornings in days long gone by. It is worth notice that the principal device in the collar of the Order of the Golden Fleece, founded in 1429, was this flint and steel.

In some districts the preparation of tinder was and remains a regular industrial occupation, for which certain fungi are used. All the hard portions are removed, and after exposure to the action of a potash ley for some weeks, the mass is beaten with wooden hammers, and finally rubbed between the hands until it becomes soft and pliant. It is then stained by the action of nut-galls, and a salt of iron, or bleached by means of chloride of lime. Paper, linen, and woollen materials, are also employed, and in latter years a portion of nitre was added to increase the inflammability.

The piece of iron or steel was made of various shapes, one of the earliest forms being the *Fusil*, a thick rhomboidal mass of steel, the faces of which were cut into many angles, while the ends were curved back so as to form a handle.

When the metal was brought rapidly in contact with the *fyr-stan*, or flint, small splinters were broken off in a red-hot state, which falling among, ignited the tinder, which was afterwards fanned into a flame in the so-called little iron box or *tinder-box*.

The Sulphur Match.—The property which sulphur possesses of taking fire at a temperature of 300° Fahr. explains its ancient use in making those matches which proved so great an improvement in connexion with the preceding, and which are still associated in our minds with many a poor old distributor. This time-honoured old match still performs an important function in the modern lucifer, and links the present to the past, through various attempts to replace it, among which we notice next the

Pyrophorus.—This substance was first made by Homberg, which may be prepared by mixing 3 parts of alum with 2 or 3 parts of honey, flour, or sugar, and cautiously drying it, with constant agitation, in an iron pan. The mixture at first melts, and dries into small pieces, which are reduced to powder, and again roasted. A portion of this powder sprinkled upon dry cotton causes it to take fire.

Dr. Hare has suggested a mixture of 3 parts lamp-black, 4 parts calcined alum, and 8 parts carbonate of potash; and Gay-Lussac, a simple mixture of 5 parts dry lamp-black, with 9 parts of sulphate of potash. Gobel has made an excellent pyrophorus by heating tartrate of lead red-hot in a glass tube, which must be afterwards hermetically sealed.

Gay-Lussac refers the action of these combustibles to the presence of finely divided sulphurets, while other chemists attribute the incandescence of the carbon to the oxidation of potassium.

We then had

The Pneumatic Tinder-box or Light-Syringe.—An ingenious application of the heat evolved by the compression of air, was made by a person called Mollet, which, although a great advance on the pyrophorus, requires too much dexterity in its use for ordinary purposes, and, as Joule and Thompson would say, the heat evolved would at best be only an exact equivalent of the mechanical power exerted.

The machine consisted of a small metallic cylinder with an accurately fitting piston. The under part of the cylinder was attached by a screw, and a small quantity of tinder or amadou was contained in a recess. By a rapid stroke of the piston driving it home, the air was suddenly compressed, which diminished its capacity for heat, when the excess ignited the amadou in the recess, which was then removed for use by various contrivances.

The first "Instantaneous Light Machine" was called the *Inflammable Air-lamp of Volta*,—Which consisted of a glass reservoir filled with hydrogen gas, that could be subjected to the pressure of a column of water by turning a stop-cock. The pedestal upon which the reservoir was placed was an electrophorus; and the apparatus was so adjusted by connecting wires, that on turning the cock a small stream of hydrogen rushed out, and met an electric spark from the electrophorus, which ignited the gas. The objection to this apparatus arose from the danger of air mixing with the hydrogen, and thus leading to explosion.

A more elegant contrivance succeeded, called

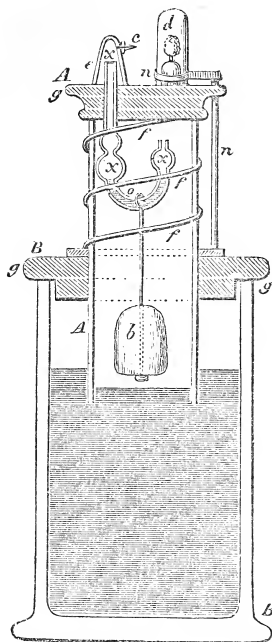
The Platina Lamp.—The discovery by Doberiner of the property which finely-divided or *spongy* platinum possesses of inflaming a mixture of hydrogen gas and atmospheric air, led to the invention of what he called the *Hydrogen Lamp*; and there is no doubt that it promoted the application of various discoveries, which had been accumulating in the laboratory of the chemist for the production of light.

Partly on this account, and partly because it is so beautiful an illustration of an ingenious application of then existing facts to a social want, we will describe this lamp at some length.

Spongy platinum is prepared by dissolving this metal in aqua regia, and adding muriate of ammonia, when the

metal is precipitated in combination with chlorine and ammonia. This substance is made into a paste, and placed in a loop of thin platina wire. When this pasty mass is exposed to a strong heat, it is decomposed, and nothing but the metal is left in the form of a porous body or sponge. Metals generally, when in this state of fine division, possess the power of inducing the combination of gases at a temperature much below that necessary under other circumstances. Faraday has found that a perfectly smooth, bright, and thin sheet of platinum, in a mixture of pure oxygen and hydrogen, in the proportion to form water, gradually acquires a high temperature, until it becomes red-hot, when the gases combine. The same action takes place with the spongy platinum, which is rendered incandescent; and the red-hot metal at last ignites the jet of hydrogen gas, as it issues from the apparatus. The spongy platinum presents a surface at least 100 times larger than the same bulk of metal in a solid form. It is supposed this peculiar property depends upon the condensation of the gases to such an extent, that not only is their natural repulsion overcome, but their molecules are brought within the range of their chemical affinity, which appears only to act at insensible distances.

The apparatus is shown in the woodcut; and the reader will find the spongy platinum covered by a brass cup *d*, which is attached to the wire *n* exactly opposite the small opening *c*, whence a stream of hydrogen gas issues when the lamp is in operation. The gas is produced in the vessel *B B*, by the weak sulphuric acid, represented by the shading, acting upon a piece of zinc *b*. The upper vessel *A A* slides in the lid *g* like the piston of a pump, and is maintained in its position by the spring *fff*, the gas escaping through the glass tube *xxx*, which is closed by a few drops of sulphuric acid *o*. When this upper vessel is



forced down by the hand, the pressure on the accumulated store of gas drives the liquid *o* into the bulbs, and allows the gas to pass into the fixed cap *o*, whence it plays in the form of a jet on the spongy platinum. The escape of the gas is, however, accompanied with a rise of the acid, which, coming in contact with the zinc, generates a fresh supply of gas, and thus the process is continued without interruption, until the materials are converted into sulphate of zinc.

This arrangement was first proposed by Eisenlohr, but many modifications were introduced in different countries. In these islands it did not prove so useful as on the Continent, where the atmosphere is not so moist, and where the spongy platinum does not so soon lose its power by the pores becoming filled, as it were, with water.

Another scientific means of lighting a match was by means of voltaic electricity. The usual arrangement of a small plate of zinc with a double plate of copper, when dipped in dilute acid, produced a current of sufficient power to heat red-hot a fine platinum wire connecting the dissimilar plates. On applying a piece of touch-paper, it was immediately ignited, with which a match was kindled. The match containing sulphur could not be brought in direct contact with the red-hot metal.

We now arrive at the first stage of modern inventions

which led immediately to the Lucifer, and we commence with what was called

The Chemical Match.—The old sulphur match was covered with chlorate of potash, and the paste used for these matches is said to have been composed of

Sulphur	25	parts.
Chlorate of potash	30	„
Colophony	2	„
Vermilion	1½	„
Gum in solution	2	„

The chlorate of potash ($K, Cl_2 O_5$), when brought in contact with strong sulphuric acid in the cold, is decomposed with an explosion and the production of fire. The products of this decomposition, in the first instance, are bisulphate of potash, perchlorate of potash and chlorous acid; but these two latter substances undergo a further change, the former becoming chloride of potassium and oxygen, while the latter is resolved into chlorine and oxygen. The products of the secondary decomposition ignite inflammable matters of all kinds, such as sulphur, resin, gum, sugar, &c., when within immediate reach of their action.

The chemical match dipped in sulphuric acid at once took fire. The acid was usually kept in a bottle filled with asbestos, and fitted with a glass stopper or a plug of india-rubber, which were used for touching the match.

Camphor and frankincense were sometimes mixed with the paste, and the wood used was cedar, so that a pleasant odour was diffused in obtaining a light.

These matches were probably invented in France, and thence introduced into this country; but previous to this date, Captain Manby had been accustomed to use a similar mixture for firing a small piece of ordnance for conveying a rope to a stranded vessel. Parke also described a similar

compound in his "Chemical Catechism," as early as 1808. Mr. Jones employed the same principles in the preparation of his

Prometheans.—He took equal quantities of sugar and chlorate of potash, which he made up into a thick paste with a solution of gum, and coloured the whole with vermilion. The sulphuric acid was contained in thin glass beads. A bead surrounded with a little of the paste was rolled up in gummed paper and then dried. The glass bead was crushed between a pair of pliers, sold with the matches, when the acid, coming in contact with the dry paste, caused the whole to ignite.

The writer may be allowed to mention that he lately had an opportunity to examine one of the Russian explosive machines, fished up in the Baltic during the summer of 1855, and found it to depend for its action upon the above ingredients. A moderate-sized tube, partially filled with cotton wool, dusted with sulphur and chlorate of potash, contained a glass bulb full of sulphuric acid. The slightest shock sufficed to break this bulb, and the fire which followed would ignite the gunpowder in the larger vessel.

A somewhat similar invention called the *Empyrion*, was superseded by the

Friction Match,—Which appeared in 1832. They were coated with a mixture of 2 parts sulphuret of antimony and 1 part chlorate of potash, made into a paste with gum-water, which was applied to the end of an ordinary sulphur splint or match. They were ignited by drawing them rapidly between the surfaces of a piece of folded sand-paper, which was compressed at the same moment by the finger and thumb. This match was the precursor of the Lucifer, which, like its friend, was the old sulphur match more neatly fashioned, and coated with an inflammable paste containing phosphorus.

It is not known who first suggested the substitution of phosphorus for sulphuret of antimony, but it proved a most important step, as the friction necessary to produce ignition was so great that the inflammable composition was often torn off by the sand paper.

Boyle and Hook are the first who allude to the use of phosphorus for producing light soon after its discovery in the seventeenth century; and it is known that Godfrey Hauckwitz, at his laboratory in Southampton Street, Strand, manufactured and sold large quantities of phosphorus for this purpose.

The Phosphorus Match, or Phosphoric Paper, as it was first called, underwent various modifications,—mixtures of phosphorus, with magnesia, lime, sulphur, white wax, cork-powder, &c., being all in turn recommended and employed. Chlorate of potash was added, which caused a noise when the match was used, but this detonating action was overcome by a mixture producing a slower combustion, and these matches were called *Congreves or Noiseless Lucifers*. The public have, however, adopted the latter designation, and thus we arrive at

The Lucifer Match,—The manufacture of which now embraces two branches,—the production of the match itself, and that of the boxes which contain them; the latter are often not united in the same works, but made “out of the house,” and at the houses of those employed. The same division of labour also prevails more and more in the making of the match, the cutting of the wood into the *splint* having become a distinct business.

T. R.

(To be continued.)

OURSELVES.

NUTRITION (*continued*).

AFTER the busy Tongue has jostled a portion of food from one side of the mouth to the other, subjected it to the action of the teeth, to a due admixture of saliva, and to the scrutiny of the sense of taste, it collects the fragments into a little heap on its upper surface; then, applying its apex to the roof of the mouth, it tilts, or rather perhaps squeezes, it into the Pharynx. If fluid is taken in a continuous draught, the sides of the Tongue are inclined slightly upwards, and form a channel for it.

Immediately, on receiving the morsel, the muscles of the pharynx close upon it and force it down into the œsophagus. During this act, the other openings which lead into and out of the pharynx become simultaneously shut up, and so, except on special occasions, the food seldom goes the wrong way.

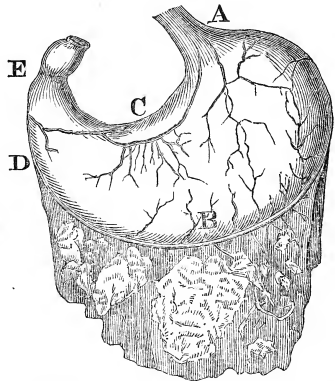
The *œsophagus*, which extends from the bottom of the pharynx to the stomach, is a strong, membranous and muscular tube, dilatable and very sensitive. Its muscular coat is composed of fibres, arranged longitudinally and transversely. Their action is so nicely adjusted, and they fulfil the law of their action so obediently, that during the act of swallowing, each portion of the canal becomes first enlarged to receive the morsel, and then contracted above and upon it; by which alternate and successive movements, it is urged continuously downwards and propelled into the stomach. The inner lining of the tube lies in plaits, which allow of its easy distension.

That much-abused but very important organ, the stomach, is the principal functionary in the business of diges-

tion. In some form or other this viscus exists in almost every animal ; and, hence, it may be properly considered as characteristic of the class. Its appearance, even in the human person, is not prepossessing. It has been likened to a leathern bottle, and to the air-receptacle of a bagpipe : it is not unlike, nor much like either. In an adult it will hold from two to four pints.

Its general form when moderately distended, is shown in the annexed figure ; and the letters indicate the parts specially named by anatomists. A is the Cardiac portion and orifice ;

so called, and for no other reason, because they lie under and near the Heart : at this opening the œsophagus terminates. B, the greater Curvature ; from it depends a large duplication of the Peritoneum—the lining membrane of the Abdomen—called the *Omentum*, which commonly contains a good deal of fat, and is some-



times overloaded with it. C, the lesser Curvature. D, the pyloric portion, and E, the Pylorus, or watchman ; so named from the almost instinctive vigilance with which it notices the exit of the food from the stomach. A part of the space between the Cardiac portion and the lesser Curvature, extending a little farther than C, is occupied by the *Little Omentum*, not shown in the sketch. It is another fold of the peritoneum, and extends to the Liver.

A very little care in the dissection shows that the stomach is formed of three principal coats or tunics ; a serous, a muscular, and a mucous or villous coat. The

serous* is the outermost. It is white, smooth, moderately dense, and almost transparent, like the Peritoneum, whence it is derived. Within this, and united to it by cellular membrane—the great packing material of the whole fabric—lie three strata of muscular fibres, arranged obliquely, circularly, and longitudinally; these form the muscular coat. A soft spongy membrane, of a reddish-white colour, having rather a marbled appearance, lines the interior. When the stomach is empty, this coat wrinkles up into little folds or rugæ, which give it a puckered appearance. If examined by the microscope it is found to be pierced, all over, with a multitude of small holes, the openings of minute tubes or pores, disposed very regularly, in quincuncial order, or groups of five. These groups are separated from one another by partitions, which give the surface the appearance of very delicate net-work. The pores are supposed to yield the *gastric juice*, a singular fluid, possessing most remarkable properties.

The inner surface is also dotted, and especially along the greater and lesser curvatures, with numerous follicles, from which exudes a semiviscid mucus, by which the interior of the stomach is kept constantly moist.

Several large arteries, much larger than its structural volume requires, supply the stomach abundantly with blood. When it is empty, they are tortuous and bent, and then the current of the blood is retarded; on the assumption of food, by which the stomach is distended, they become straitened, and then the flow of blood is more lively. The veins are mostly counterparts of the arteries.

In common with the tongue, the pharynx, the lungs and the heart, the stomach derives some of its nerves directly from the brain; and in common with the viscera of the chest

* This term is applied to membranes which pour out a thin watery fluid called *Serum*.

and abdomen, it is largely supplied by the great sympathetic nerves. Hences arise its great sensitiveness; the singular sympathy with which it regards every other organ in the body; its seeming consciousness of the necessities of the whole fabric; the influence which, directly or indirectly, more or less, it exercises over every mental and bodily function; their reflex influence on its condition; and, in no inconsiderable degree, the feeling with which they reciprocate its ill or well being.*

At the pyloric orifice, shown in the sketch at E, the *intestinal canal* is united to the stomach. In the human person this canal is about thirty-five feet long. It is naturally divided into two distinct portions, the small and large intestines; which are again subdivided, by anatomists, for description's sake. The small intestines consist of the *Duodenum*, so named because it is about twelve inches long; the *Jejunum*, usually found empty (hence its name); and the *Ileum*, called so from its numerous convolutions. Their general structure is nearly alike. Like the outer coat of the stomach, their outer coat is smooth, nearly transparent, and serous, and is derived from the peritoneum. All the fibres of the muscular, the second coat, are disposed transversely or circularly. A third coat, consisting of cellular membrane, forms a stratum, in which the blood-vessels and nerve-fibres, with which the whole canal is richly supplied, pass and ramify: on this account it is called the nervous or vascular coat.

There is a good deal of difference in the appearance of the mucous membrane, the fourth coat with which the interior is lined, in different parts of the tube. It is thicker than the inner lining of the stomach; but, like it, is covered, everywhere, with a delicate network. Little portions of the lining

* A volume might be written on the nature and consequences of this curious relationship.

from two to six lines broad, folded together, form an irregular series of crescent-shaped ridges. They are called *Valvulae conniventes*. These ridges, or imperfect valves, which are large and numerous in the duodenum and jejunum, become fewer and smaller in the ileum, and disappear altogether, before that part of the canal ends in the large intestines.

Innumerable villousities stud the whole inner surface; they are little pendulous pellets, formed of the velvet-like pile of the mucous membrane. In the intervals between them, are numerous mucous glands and follicles, which pour out a lubricating moisture. The termination of the ileum, the final portion of the small intestines, is very abrupt. It is, as it were, pushed at right angles, into the side of the colon, one of the large intestines, beyond the surface of its inner lining. The projecting piece forms a circular flap, which answers all the purposes of a valve.

Anatomists distinguish the large intestines, which are about seven feet long, into three parts, the Colon, the Cæcum, and the Rectum. They are thicker, stronger, and a good deal more capacious, than the small intestines. Those fibres of their muscular coat which are arranged longitudinally, are collected into three bands, which, being shorter than the canal itself is, pucker it into a series of pouches or cells. A layer of fibres arranged circularly, more numerous however in some parts than in others, surrounds the whole tube. On the inner surface there are but few of the villi, which we noticed as being so numerous in the small intestines, nor are there any falciform valves; it is however marked all over with the orifices of numerous little tubes and mucous follicles.

The *Cæcum* lies in the interior of the right-haunch bone. It is a *cul-de-sac*, having its concavity undermost. Attached to it is a little appendage, from three to four inches long,

called the *Appendix vermiformis*, or worm-shaped appendix.*

If the valvular termination of the small intestine did not cause a natural division, the distinction into colon and cæcum would be almost an arbitrary one, for there is little or no difference in their structure. The colon, in fact, is but a continuation of the cæcum. Arising from it, it passes upwards as high as the ribs, then crosses to the left side of the abdomen, and forms what is technically called the transverse arch: again turning downwards and backwards it bends like the Greek letter ζ , and ends in the rectum, just on the margin of the pelvis. P. S.

REVIEW OF THE MONTH.

To Mr. Mombert we are indebted for a translation of Tholuck's "Commentary on the Psalms." Clear and succinct, and combining masterly exposition with deep devotional feeling, it will be welcomed by those who wish to sing the songs of Zion with understanding, or to read them with hearty appreciation. To those who want a key to the Prophetical Scriptures, we commend Dr. Fairbairn's "Prophecy viewed in respect to its distinctive Nature, its special Function, and proper Interpretation,"—a fine specimen of un-

* The mention of this appendage would have been hardly necessary, as its use is not known, but it is tubular, and has an orifice which opens into the cæcum. Occasionally the hard stones and larger seeds of fruits pass into and become impacted in the tube. They not unfrequently induce inflammation and death. An instance which came within the knowledge of the writer of this paper arose from the inadvertent swallowing of the stone of an olive.

tentatious learning, profound thought clearly expressed, and sound Christian philosophy. In his "History of the Jewish Nation after the Destruction of Jerusalem under Titus," Dr. Edersheim has supplied information which the English reader will hardly find elsewhere. To trace the fortunes of the peculiar people in the lands of their dispersion needed no ordinary industry and enthusiasm. These Dr. E. has brought to his task, which has evidently been a labour of love, and the result is a vast amount of research condensed into a well-written narrative. If we have any fault to find, it is that the learned author has poured forth his stores with a profusion, which, however acceptable to the student, is almost bewildering to the popular reader. "Sacrifice, or Pardon and Purity through the Cross," by the Rev. Newman Hall, is a brief view of the Atonement, simple and Scriptural, and rendered especially valuable by its practical tone : to which we have a companion or counterpart treatise, in Dr. Candlish's "Christian's Sacrifice," marked by all its author's originality, energy, and elevated feeling ; a searching and rousing little volume. "The Shepherd King" is the story of king David, told to the young by the excellent authoress of "The Folded Lamb;" and the name of Dr. Cheever alone will secure numerous readers for his charming "Lectures on Cowper."

With its racy anecdotes and rich Saxon English, Lord Cockburn's "Memorials of his Time" will be one of the most popular, as it is certainly one of the most amusing books of this season. Owing to the wonderful growth of their cities, and the many ebbs and flows of opinion and feeling, there is no country in which travels become so rapidly obsolete as amongst our Transatlantic cousins ; but in "America, by River and Rail," Mr. Ferguson has described the great Republic as it existed a few months ago. With his access to the best information, and with his

very various points of view,—religious, social, commercial, and scientific,—there are in Mr. Ferguson's work more diversified and authentic details than any ordinary tourist could supply; whilst his bright and cheerful spirit, and his sympathy with "whatsoever things are honest, and whatsoever things are lovely," render him a delightful fellow-traveller. Mr. M'Gilchrist's "History of the Turks" is an animated sketch of a wonderful story, rehearsed with conversational vivacity, and sufficiently comprehensive for all ordinary purposes. We are delighted to recognise a new poet in Mr. Stewart Lockyer, the author of "St. Bartholomew's Day, and other Poems." For music, freshness of fancy, and depth of feeling, we have seldom read anything finer than "Tintoret and his Daughter," "The Church Bell," "The Monks of Burnside," and "Stradella."

A delightful feature of the age is the tone of our highest periodical literature. With contributors like Rogers and Stanley, a wonderful change has come over the "Edinburgh" and "Quarterly" since the day that the one jeered at all faith, and the other at all religious earnestness. For the last twelve years two younger contemporaries have done good service to the cause of Christian progress; the "British Quarterly" with a succession of papers, the most admirable antidotes to modern infidelity which have appeared in England, and the "North British," as profound in mental philosophy as it is masterly in physical science, and bold in grappling with the social problems of the age. And we have now to welcome in the "London Quarterly" another, which, judging from its recent numbers, promises to contribute equal talent to the same great cause. The variety, the vigour, and the eloquence of its articles, can hardly fail to secure for it fame and permanence.

Many of our readers have a lively remembrance of little monographs on "Parrots," "Humming-Birds," and

“Pigeons,” which have from time to time appeared in our pages. The keen fond eye, which watched the habits and revelled amid the chromatic splendours of the winged creation, can observe them no more; the cunning hand which described them is cold. Little more than a fortnight after the publication of the last of these papers, viz., on the 17th of May, Mr. James Wilson died at Edinburgh. He was an adept in nearly all the departments of physical science; and most of the articles on Natural History in the “Encyclopædia Britannica” are, in part or in whole, from his pen. Refined, sagacious, witty, full of information and kind-heartedness, he was a perfect Christian gentleman; and no compositions of the kind could be more delightful than his “Yacht-Voyage round the Coasts of Scotland,” and his contributions to the “North-British Review” on Birds, Fly-fishing, and similar subjects. From an interesting sketch in “The Witness” newspaper, we find that “shortly before his death he calmly arranged all his affairs, leaving messages for his friends, and mingling with them announcements of his faith in Christ crucified as the only ground of hope. Among the passages in Scripture he last dwelt upon were the words, ‘Faint, yet pursuing,’ and ‘Looking unto Jesus.’ A few hours before his death, he said, ‘There is no darkness in the valley; all is brightness.’ . . . ‘Christ the hope of glory.’ ‘There is none other name given under heaven, whereby men can be saved.’ In a few minutes he added, ‘Eye hath not seen, nor ear heard, neither hath it entered into the heart of man to conceive, the things which God hath prepared for them that love him.’ And not long after uttering these words, at early dawn on Sabbath he fell asleep in Jesus, so calmly that those around him knew not when he departed, to be for ever with the Lord.”





The Eyr of the Golden Eagle.

THE EAGLE.

EAGLES are now comparatively rare birds in this country, except in Zoological Gardens. Fifty years ago no one could visit the mountain parts of Great Britain and Ireland, without seeing some specimens of the Golden Eagle soaring among the mountains, or pursuing their prey over the ridgy sides of Welsh and Scottish hills. The Sea Eagle, too, was not an uncommon bird on rocky coasts, now all but deserted by his lonely majesty. Civilisation, the great enemy of Rapacious Birds and Beasts, and continued persecution, have rendered our two largest birds of prey well-nigh strangers to these lands. The sheep-farmer and the deer-stalker unite in destroying the noble game; even the collector of birds' eggs is content to import his specimens from the nests of eagles which have bred in Norway or some more southern land. Bears and wolves have long since been extirpated; golden eagle, sea-eagle, and osprey, are likely soon to be numbered in the lists of former occupants. The naturalist, the artist, and the sportsman, lament their rarity, but the sheep-owners, and, if tales be true, the mothers of sweet little children, have every reason to rejoice.

There are many species of Eagles in the world; at least eight are indigenous to southern Europe. Like monarchs they require large space for their wings and domains, and in no part of the earth are they abundant. They prefer mountainous regions, for there they can nestle securely, and in such a position they can alone find a fit centre for their operations. The eagle

“Is the sultan of the sky; and earth
Pays tribute to his eyrie.”

The Poet Laureate describes him well:—

“ He clasps the crag with hooked hands ;
 Close to the sun in lonely lands,
 Ring'd with the azure world, he stands.
 The wrinkled sea beneath him crawls ;
 He watches from his mountain walls,
 And like a thunderbolt he falls.”

Any one, who has gazed upon the great North Sea, from that dizzy precipice the Noup of Noss in Shetland, has seen the haunt of our sea-eagle, even although he may be disappointed in seeing the birds themselves,—off, perhaps, on some excursion of pleasure to the nearest mainland, that of Norway, or resting for a while on some rock near Iceland. It can be no want of food that tempts him to wander, for the Shetland seas abound with fish of all kinds, and the lofty rocks are, in places, white with birds. The eagle, though she “wanders from her nest,” is very constant in her attachment to its site, and the same pair have been watched for years, rearing their young in the same spot,—pictures of constancy and natural affection, worthy of being copied from characters otherwise ferocious.

The male eagle, like the male of most birds of prey, is smaller than his mate, and it requires the lapse of two or three years before eagles acquire their perfect plumage. In books, not older than that of the worthy Bewick, the golden eagle is figured under two names, while the sea-eagle was believed to form two species, now known to be old and young of the same bird. The Scriptures allude to this differently-coloured moult of feathers, and infer, in that way so peculiar and so characteristic of Holy Writ, that strength increases with the change of plume. Christopher North exclaims,—and the late Edinburgh Professor had studied the birds in their native haunts,—

“ Oh for the Life of an Eagle, written by himself! Proudly would

he, or she, write of birth and parentage. On the rock of ages he first opened his eyes to the sun, in noble instinct affronting and outstaring the light. The Great Glen of Scotland—hath it not been the inheritance of his ancestors for many thousand years? No polluting mixture of ignoble blood—no, the golden eagles of Glen-Falloch, surnamed the sun-starers, have formed alliances with the golden eagles of Cruachan, Ben-Lawers, Shehallion, and Lochnagar—the lightning-glints, the flood-fallers, the storm-wheelers, the cloud-cleavers, ever since the deluge. The education of the autobiographer had not been intrusted to a private tutor. Parental eyes, beaks, and talons, provided sustenance for his infant frame; and in that capacious eyrie, year after year, repaired by dry branches from the desert, parental advice was yelled into him, meet for the expansion of his instinct, as wide and wonderful as the reason of earth-crawling man. What a noble naturalist did he, in a single session at the college of the cliff, become! Of the customs, and habits, and haunts of all inferior creatures, he speedily made himself master—ours included. Nor was his knowledge confined to theory, but reduced to daily practice. He kept himself in constant training,—taking a flight of a couple of hundred miles before breakfast, paying a forenoon visit to the farthest of the Hebride Isles, and returning to dinner in Glenco. In one day he has flown to Norway on a visit, and returned the next to the head of the Cambrian Dee. He soon learned to despise himself for having once yelled for food, when food was none; and to sit or sail, on rock or through ether, athirst and an hungered, but mute. The virtues and fortitude have become with him, in accordance with the Aristotelian moral philosophy—habits. A peripatetic philosopher he could hardly be called—properly speaking, he belongs to the solar school—an airy sect, who take very high ground, indulge in lofty flights, and are often lost in the clouds.”*

The quill and tail-feathers of the golden eagle are used in the Highlands of Scotland as ornaments to the bonnet, and seem to suit well that simple covering of a manly head. The Indians who wander over the north-western prairies of America kill this eagle for the express purpose of decorating their persons and their implements of war with its tail-feathers.† Only the other day, such feathers were very prominent ornaments of the persons of four full-dressed

* “Recreations,” iii. 44.

† Audubon’s “Birds of America,” i. p. 51. (ed. 1840.)

Indians, now exhibiting themselves in London, and walking, conspicuous objects, across New Oxford Street.

Many noble species of the eagle tribe may now be seen in the Regent's Park, as fat, if not happy, as eagles in a roomy cage can ever look. The following sentences may enlighten our readers on the manners of a conspicuous member of the distinguished race, there imprisoned. The habits of all eagles are closely similar to those of the fine species, once abundant at our antipodes. The Wedge-tailed Eagle of Australia (*Aquila fucosa*, Cuv.) seems to take the place, in the southern hemisphere which the golden eagle occupies in the northern. The bird is even bolder than our eagle, and has certainly a more pleasing form from the great length of the wedge-shaped tail, which does not detract from its sombre dignity. Mr. Gould,* its historian, killed one which measured six feet eight inches from tip to tip of its pinions, and is certain he has seen specimens considerably larger than the one referred to. He tells us that the natural disposition of this Eagle leads it to frequent places remote from the sea, and that its nest is placed on the most inaccessible trees, and is built or rather matted with sticks and boughs. He never succeeded in getting the eggs, as the aborigines of Tasmania, who had the power of ascending such trees, are now removed, and no European can mount a tree-stem which rises more than a hundred feet before it gives off a branch, and it is on such trees that the wedge-tailed eagle forms its flat aerie. From Mr. Gould's masterly work, the following interesting information is derived:—

“It preys indiscriminately on all the smaller species of kangaroo which tenant the plains and the open crowns of the hills; and whose retreats, from the wonderful acuteness of its vision, it descries while soaring and performing those graceful evolutions and circles in the air, so frequently seen by the residents of the countries it inhabits; neither is

* “Birds of Australia,” vol. i.

the noble bustard, whose weight is twice that of its enemy, and who finds a more secure asylum on the extensive plains of the interior than most animals, safe from its attacks; its tremendous stoop and powerful grasp, in fact, carry inevitable destruction to its victim, be it ever so large and formidable. The breeders of sheep find in this bird an enemy, which commits ravages among their lambs; and consequently, in its turn, it is persecuted unrelentingly by the shepherds of the stock-owners, who employ every artifice in their power to effect its extirpation; and in Van Diemen's Land, considerable rewards are offered for the accomplishment of the same end. The tracts of untrodden ground, and the vastness of the impenetrable forests, will, however, for a long series of years to come, afford it an asylum, secure from the inroads of the destroying hands of man; still, with every one waging war upon it, its numbers must necessarily be considerably diminished. For the sake of the refuse thrown away by the kangaroo-hunters it will often follow them for many miles, and even for days together. I clearly ascertained that although it mostly feeds upon living prey, it does not refuse to devour carrion, or animals almost in a state of putridity. During one of my journeys into the interior, to the northward of Liverpool Plains, I saw no less than thirty or forty assembled together around the carcass of a dead bullock,—some gorged to the full, perched upon the neighbouring trees, the rest still in the enjoyment of the feast."

Mr. Backhouse* gives us an instance of a woman having been chased by a wedge-tailed eagle for some distance, and tells us she was forced to run to a house for shelter. The wife of a settler informed this philanthropic traveller and naturalist, that she was one day struck with the action of a horse in an inclosure, and noticed, as it galloped rapidly backwards and forwards, that it was chased by two eagles. The horse at last fell, and was pounced upon by one of these birds, which was only driven away by two or three men coming up.

After such a narrative, few can doubt the capacity, as well as the will, of a large eagle to carry off a child, though there may be much doubt as to the truth of many of the tales of mothers having climbed to the nests, and recovered their offspring uninjured.

* "Narrative of a Visit to the Australian Colonies," p. 153.

Magnificent as the eagle is, and celebrated for its nobility, truth compels the naturalist to say, that the "Bird of Jove" is often a great coward, and as satisfied with carrion as any ignoble vulture of the true type of the scavenger. And yet, says one* who had sometimes seen him among the brown hills of Albyn, "The eagle is a magnificent bird, and when met with on some grim Alpine crag projecting from the grey mist, inspires a kind of respect, of which some degree of fear is an essential ingredient." When seated a prisoner in a cage of the Zoological Gardens the eagle has a ferocious aspect, with those bright eyes gleaming from below the arched eyebrows, and that hooked beak, corresponding in strength and massiveness with the crooked talons and great expanse of wing. The poet Campbell † may well exclaim :—

"There's such a charm in natural strength and power,
That human fancy has for ever paid
Poetic homage to the bird of Jove.
Hence, 'neath his image, Rome arrayed her turms
And cohorts for the conquest of the world.
And figuring his flight, the mind is fill'd
With thoughts that mock the pride of wingless man."

Should any of our readers happen to visit the Zoological Gardens when the birds of prey are fed, let them look on the Harpy Eagle of South America (*Thrasaëtus destructor*) at such a time. Always peculiarly truculent in aspect, he then looks like Ferocity personified. The crested head seems to expand; the membrane of the eye appears to pass and repass; the thick legs, and the deadly grasp of the talons, become conspicuous; and the visitor, looking at that foreshortened beak, as rapidly seen in profile, and then again foreshortened, can easily believe the narrative which relates, that the harpy at one blow can split open a horse's skull.

* The late Professor Macgillivray, "British Birds," iii. 205.

† "The Dead Eagle," written at Oran.

“ Who dare meddle me ? ” is written on these fierce features as clearly as if the words were spoken by the “ soul of fire.” It is a pity that the bird was not a native of the United States. Had the noble tyrant been found there, no citizen of the States would have adopted the cowardly White-headed Eagle (*Haliaëtus leucocephalus*) as his representative.

This bird’s predatory habits are depicted by Alexander Wilson with rare interest of description; for the reader follows the fish-hawk with his sympathy, and would feign deliver the diligent bird from this white-headed hoary thief. Well may Benjamin Franklin refer to the “ bad moral character ” of this badge of America, “ which does not get his living honestly.” “ Besides,” adds the shrewd philosopher, “ he is a rank coward; the little king-bird, not bigger than a sparrow, attacks him boldly, and drives him out of the district. He is, therefore, by no means a proper emblem for the brave and honest Cincinnati of America.”

In some of our European states the eagle is the national emblem, and under its expanded form—sometimes gilded, sometimes black, now with one head, and now with two—deeds of rapine have been perpetrated which have deluged the world with blood.

Truly “ where the carcase is, thither are the eagles gathered together.” So was it that the Romans, one of whose chief standards was an eagle, came down on the decayed remnant of the Jewish nation, as prophesied by Him whose word is truth (Matth. xxiv. 29); and so will all who oppose that word, and “ neglect so great salvation,” be yet destroyed. (Luke, xvii. 37; Rev. xix. 17, 18). The eagles of other lands invite our attention; some soaring in South Africa, the land of antelopes and of heaths; others, like the Mhorungah of India (*Aquila Bonelli*), among the ranges of the Ghauts, pouncing on game, and not even despising to capture pigeons. Dr. Horsfield, that venerable naturalist, could show us the Javanese Sea-Eagle (*Pandion*

Ichthyaëtus) suspended in the air over some lake in Java, or sailing slowly along as he watched his fishy prey.* With Alexander Wilson or Audubon as a companion, the reader might linger over the recital of the deeds of North American eagles. In South America, Waterton and Natterer, Spix or Wallace, might be his attendants. We would advise him to take Gould as his guide in Australia, while Hewitson and Charles St. John, or even Christopher North, would teach him much, from personal observation, of the habits of our golden and sea-eagles. There are many eagles, each one distinct in face and in figure, and all of them in beak, in talon, in expanse of wing, in breadth, or pointedness of tail, and even in contour, admirably adapted by their Maker for the sites where He has placed them. The Scripture abounds with illustrations derived from the eagle. Nebuchadnezzar, that great monarch, is referred to by the prophet Ezekiel (Ezek. xvii. 3) as “a great eagle, with great wings, long-winged, full of feathers, which had divers colours;” while Isaiah, referring to the same King of Assyria, prophesies that “the stretching out of his wings shall fill the breadth of thy land, O Immanuel.” To “mount up on wings as eagles,” is imagery as poetical, as it is powerful and true to nature. The mode in which the eagle trains its young has been described in Holy Writ by one who had, doubtless, observed the eagles as he fed the flocks of Jethro among the mountains of Arabia. Job and other inspired writers refer often to this bird and its habits. The Assyrians, as their monuments show us, used its head, and claws, and wings, as emblems of strength, ferocity, and swiftness. The Bible, from Genesis to the Apocalypse, has illustrations and imagery derived from the structure and habits of this powerful race of birds. It is the Lion of its class.

A. W.

* “Zoological Researches in Java;” Catalogue of Birds in Museum of East India Company, i. p. 54.

A SABBATH WELL SPENT.

THERE is danger in Sabbath desecration. "Near a beautiful village in the State of New York," writes an excellent minister of our acquaintance, "there lived a farmer of wealth and respectability, but he was a sceptic. Whether he had been religiously trained we know not; but in the early part of his life he had been a regular attendant on the ordinances of the Sabbath. His health was remarkably robust, and had been all his life, being now about fifty years of age. You would have selected him among a thousand as the longest-lived, according to appearance. It was a clear and cloudless Sabbath morning when the farmer set out to gather his hay. He had a long bridge to pass before he reached his fields. The gate-keeper gently reminded him of the sacred obligation of the Sabbath, and of the great guilt of thus labouring on the Lord's day. He tossed his head, and replied that he had not been to church for sixteen years, and that he paid the workmen twelve cents extra for what they did on the Sunday. He was reminded that life is uncertain. 'Why,' he replied, 'I am such a knot of hardy health, Death himself has not an arrow which can pierce me.' During the afternoon, however, the skies began to darken, and a summer shower seemed rising to water the earth. The farmer, with all his hands, strained every nerve to finish their work and secure the hay. He was labouring with all his energy in building a stack, when a sudden flash was seen; the bolt descended, and all was over. There lay the Sabbath-breaker—dead, and his sins sealed up to judgment. I saw his funeral slowly winding along the borders of the beautiful meadows which yesterday he owned, and I wondered if his spirit thought it wise *then*

to violate God's law."* There is danger in Sabbath-breaking. The Sabbath is sacred, and to desecrate it is to dishonour Him who claims it as His own. Sins against society God leaves it to society to punish, and therefore it is seldom that the hand of Omnipotence strikes dead in the very act the thief or the murderer: but sins directly against Heaven's Majesty are from time to time visited at the moment, that a salutary fear may fall upon transgressors. Not always—for that would put an end to human liberty; but often enough to inspire with a certain awe human temerity. An Achan, an Ananias practically defies the Divine omniscience; that omniscience vindicates itself in his destruction. A Korah rebels at the Divine sovereignty, and the earth opens her mouth and swallows the rebel. Uzzah handles the sacred ark as if it were a common chest, and the Lord smites him, and he dies. Multitudes may have perpetrated similar offences with impunity; but these and similar examples occur, ever and anon, that sinners may fear and forbear. So it is no superstitious sentiment we try to awaken; but, knowing the frequency of instances akin to the one now quoted, it is to the reverential instincts and sober reason of every one who is tempted to desecrate God's day, that we appeal in saying, Take care. This desecration is very dangerous. The day belongs to God, and if you assail it, He may avenge it in *your* person. Take care that you be not the Uzzah of this ark, the Korah of this controversy. Take care that it be not recorded in your epitaph, that in the upsetting of that pleasure-boat, or the collision of that excursion-train, you were the hapless victim of Sabbath-profanation.

But if sentence against an evil work is seldom executed thus speedily, the danger is none the less; for there are greater

* Van Doren's Mercantile Morals, p. 271. Similar facts are collected in a volume of Tract Society Anecdotes, entitled "Admonitions."

calamities than sudden and untimely death. The man who, fleeing from his creditors, flings himself into the nearest ship, may escape without paying his debts ; but if it turns out that fever is raging on board, and he catches the deadly contagion ; or if the vessel proves to be a corsair, and the adventure ends in his being sold to life-long slavery, he has no reason to boast of his luck or his agility. And just so : it would have been well for many a Sabbath-breaker, if, in his first daring act of transgression, the stroke of vengeance had laid him low ; for then he would have died comparatively innocent. But sentence was not executed speedily, and so his heart was fully set in him to do evil. He absented himself, for the first time in his life, a whole day from the sanctuary. That made it easier to remain away another. He spent that other in sauntering about the fields, or, with a little scruple at the first, he took up a newspaper or a novel. By and by he found himself in a tea-garden or a Sunday tavern. There he met with loose acquaintances,—companions who taught him to bet and gamble, to live beyond his income, to live on borrowed money or by dishonest means. And by and by he learned to live for pleasure. He became a frequenter of casinos and dancing-saloons ; the associate of low and abandoned characters ; a reveller, a nocturnal rioter, and consequently a neglecter of his daily duties—till now, perhaps dismissed from his employment, at least disliking his stricter and more virtuous friends, with a conscience deadened, an imagination polluted, a heart corrupted, he is manifold more the child of hell than at the outset of his ungodly career. To all young men amongst our readers we would earnestly say, Be careful of your Sabbath. Do not make acquaintance with those who mis-spend the hallowed hours, or whose visits would be the means of wasting yours. Do not accept invitations to pass the day with those whose standard of Sabbath

observance is low, and under whose roof you might be tempted to do what you would not do at home. Beware of the beginnings of evil. Reading a work of science, listening to secular music, taking a walk with a frivolous companion, even wandering from church to church in quest of excitement, you may impair the sense of sanctity with which God's day has been heretofore surrounded. And once this is impaired, other evils are sure to follow. It is almost certain that a wasted Sabbath will be followed by a worldly-minded week. On the morrow you will rise with a gloom in the atmosphere, a cloud on your conscience. You will have little heart for prayer, and the scanty pretence will grow more and more formal. And the more that prayer is restrained, the farther away will God's Spirit depart. You may almost feel Him go. Your heart is getting dry, earthly, dead. You are learning to dislike earnest Christians, and you are beginning to see that there is such a thing as righteousness overmuch. Nay, without knowing it, you are a kind of infidel already. You believe that the received account of man's ungodliness is extreme; you cannot help hoping that there is some other way in which men may be saved besides through Jesus Christ, and you wish that there was more value attached to natural goodness, and less ado made with the Bible. God's Spirit is grieved. The great realities are no longer in contact with your mind, and, losing faith, you may soon lose the fear of God. Losing the fear of God, what is there of which you might not be capable? Come with us to this hospital, and see this young man, once virtuous, once a church-goer, nay, once a communicant. See him as there he lies in agony, his bones filled with the sins of his youth, and his memory crowded with a strange medley,—the village sanctuary, his pious mother, his little sister-playmates, mingling with the horrid orgies and vile companions of later days, like a dream in

which heaven and hell float through one another. See him as he tosses there, his eye wild with pain and remorse together, and see the fruits of Sabbath-breaking : for *his* were virtuous friends, till idle and ill-spent Sundays introduced him to the vicious. Come with us to this asylum, and see that poor imbecile. Once a prosperous trader—once master of his own handsome villa, where graceful hospitalities awaited welcome friends—once a man of sense, intelligence, and taste—how is it that he is now, in sordid attire, a trembling, phantom-haunted maniac, in a pauper hospital ? He began with broken Sabbaths. Partly exhaustion, partly indolence, he rose occasionally too late for the house of prayer, till the omission grew more frequent ; and deprived of the calm restorative which devotion used to bring, and not altogether well at ease within, he sought to cheer his flagging spirits with strange fire. His associates grew more jovial, his habits more convivial ; till at last Sabbath afternoons became seasons of habitual revelry. And somehow business felt it. Now that the Sabbath filter was out of order, his mind grew muddy, and now that communion with Heaven had entirely ceased, his moral tone fell lower ; and, walking contrary to God, God walked contrary to him. Things went wrong, and, having let slip his better friends meanwhile, he could not get these things right again. His refuge was his deeper ruin. “I will seek it yet again.” He sought it, and was once more bitten. But “no cure like a tooth of the snake that stung me,” till now, with shattered nerves and addled brain, a cure can be no more hoped for. Come with us to this police-station, where, stark and stiff, in dripping clothes, they are carrying in the corpse found in the river this Sunday morning. Remove from the swollen face the veiling kerchief, and identify the form from which an immortal spirit has so lately passed away to the presence of the Judge. The chest is broad, the brow

is high, and it would have been long before years had blanched or thinned those locks so dark and massive. Who were his murderers? The providers of Sunday entertainments,—the masters of the Sunday revels. These drew him from the home of virtue and the house of God. These led him into expense, extravagance, embarrassment. Through the billiard-room, the race-course, and the money-lender's office, these have dragged him up to the very prison-door; till, rather than confront the Monday's exposure and disgrace, a leap from London Bridge has cut the knot and closed the tragedy.

Young men, you who live in our crowded cities especially, you cannot esteem the Sabbath too holy or too honourable. The course of the world, the drift of the age, the open shops, the obtrusive desecration, the surrounding influences, all are adverse. But highest interests are at stake,—your temporal and eternal welfare is involved. As you arise and go forth, and pass along, just suppose that you are not solitary. Fancy that you feel on your shoulder the hand of a tender and God-fearing parent, saying, "This is the way, walk in it." Nay, listen,—it is no fancy,—listen to the voice of your heavenly Father, saying, "Remember the Sabbath-day to keep it holy. Do not thy pleasure on my holy day."

But if there is danger in Sabbath-desecration, there is great delight in Sabbath-keeping.

Here is a boundary wall, high, dark, and solid, with a row of spikes running round the coping. Immediately within the wall extends a tangled copse or bushy wilderness, by no means inviting; and every here and there is set up a "Warning to Trespassers." But yonder is a stately gateway, with a handsome lodge; and, under escort of some member of the family, you enter, and up the shady avenue with its gravelled path and turfý border, you pass to the splendid mansion, with its costly collections, its refined

society, its beautiful prospects, its gardens swimming with fragrance and flaming with exquisite flowers. You are now a member of the family ; there is no fear that you will wantonly deface or damage anything ; and the lord of the manor says, "All things are yours. Make yourself at home. Walk at liberty."

Something like this are God's inclosures in our world. The Christian Church appears blank and uninviting to spectators from without, or it actually frowns and looks formidable. Worldly men observe the outside wall, built up of texts and tenets, and coped with warnings and threatenings, and to them it looks exceedingly dull and dreary : just as the park inclosure has appeared to yourself skirting it mile after mile on the dusty highway. But when, through the door of faith you really get within, what a delightful discovery ! A propitious God, a peaceful conscience, the society of the saints, the hope full of immortality, all the holy and happy emotions which the blessed Comforter inspires — a perfect paradise restored. Now that you are inside of this garden inclosed, you almost lose sight of the boundary wall which once looked so sombre, or if you glimpse the once-deprecated warnings and dreaded decrees, now that your feet stand safe within the precincts of salvation, and now that you view them through vistas of great and precious promises, their aspect is utterly changed. Introduced by the Heir Himself, you are welcomed by the Lord of the land : "All things are yours, for ye are Christ's. Yours is the kingdom. Eat and be satisfied. Inherit the earth."

So, too, with the Sabbath. It is also a sacred inclosure ; and although there is an impression among the more respectable passers-by that it is a good and useful institution, there is a very common prejudice against it. Knowing only the outside of it, many speak of it as dull, puritanical, gloomy ; and when they come to the notices here and there

erected, with the royal arms above and the "caution to trespassers" beneath, a certain resentful or impatient feeling rises in their minds, and they are almost tempted to imitate those disloyal subjects, who from age to age have hurled their missiles at the hated prohibition. But when a mind comes to be right with God, it sees that there is no way so good as God's own way,—no plan for the creature so wise as to fall in with the Creator's prescription; and this commandment, if a righteous requirement on the part of the great Governor, it also recognises as "holy" and "good" for the governed. Brought within the precincts, blessed with that inward peace and that complacency in God which are themselves sabbatic, the institution begins to wear the aspect of a privilege and a boon. Congenial with the new nature, and relieved from pains and penalties, its sanctity is safe in the guardianship of filial piety. To such it is "a delight, the holy of the Lord, honourable."

But although a devout mind is the best interpreter of the ordinance, and will be the best keeper of the command, it may not be amiss to revert to one or two principles which may help us to walk at liberty; all the rather that the necessities of the case have lately tended to resolve the ethics of the Sabbath very much into a series of prohibitions and restrictions.

The Sabbath, then, is "made for man," and for man who is made up of soul and body. To this last, as well as to the former, it is designed as a restorative. If, therefore, you are over-wrought throughout the week, it is no sin to retire to earlier rest on the Sabbath evening, or to enjoy an hour of extra sleep on the Sabbath morning. Still happier is your lot if you do not need this, and if, like some of our pious fathers, you can make the best day of the week the longest. But it may be otherwise. You may be worn and weary, and without the renovation of ample slumber, even

the Sabbath would be to you a less perfect delight. If so, —if it is not the drowsiness of the sluggard, but the sleep of the exhausted labourer you indulge, — take it, and bless the Lord of the Sabbath for the opportune refreshment.

But as the immortal nature is the chief part of man, the Sabbath was made chiefly for man's soul.

There is much of his own vigorous sense in the rules which Dr. Johnson laid down for his own Sabbath-keeping.

“ 1. To rise early, and in order to it, to go to sleep early on Saturday.

“ 2. To use some extraordinary devotion in the morning.

“ 3. To examine the tenour of my life, and particularly the last week; and to mark my advances in religion, or recession from it.

“ 4. To read the Scriptures methodically, with such helps as are at hand.

“ 5. To go to church twice.

“ 6. To read books of divinity, either speculative or practical.

“ 7. To instruct my family.

“ 8. To wear off by meditation any worldly soil contracted in the week.”*

Yes, the Sabbath is the day for special devotion. Take time to pray, and, in order that prayer may not be a task, think of some topics: think of last week with its sins, its mercies, its prospered engagements, its seasonable supplies; and think of the one now begun, with its duties, its wants, its temptations, its dangers, and in the name of the Great Intercessor ask help for the time of need. Think of your acquaintances, your relations, your fellow-worshippers, your suffering neighbours,—those friends who have asked for your prayers. Think of Christ's kingdom, and pray that it may come in this country, over the Continent, throughout the world.

* Boswell's "Johnson," by Croker, vol. ii. p. 56.

As the basis of self-culture, seek self-knowledge. Do I love the Lord Jesus? Is the Gospel a reality to me? Is my horizon brightened by its hopes? Is God endeared by its kindness? Do I grow in Christian excellence,—in activity, in usefulness, in the gainliness which commends the truth, in the superiority of purpose which sets forth its majesty? Friends—do they increase? and do my good offices multiply? or do friends fall off, and do I deserve to lose them? The sins that easily beset me—are they waxing stronger or weaker? Pride, touchiness, procrastination, sloth, peevishness, detraction, love of good cheer, sensual indulgence — do they wax or wane? or are old faults replaced by new?

Such thorough and honest self-scrutiny would supply materials for prayer, and motives to the earnest reading and hearing of God's word. And with the supplicated aids of the Holy Spirit, it could hardly fail to result in perceptible progress and improving character.

Nor must we omit the methodical reading of Scripture—that book so deep, so broad, that all the expositions in the world will never exhaust its meaning, and although the last saints on earth will see in it wonders which escaped the whole of their predecessors, they will not see an end of its perfection. The Sabbath is the day for the study of the Book Divine,—for its full, deliberate, meditative perusal; for getting a comprehensive view of its contents,—the drift of its arguments, the connexion of its narratives, the burden of its prophecies. This is the day for comparing Scripture with Scripture, for investigating those hidden harmonies, and those mutually supplementing discrepancies which show not only its accurate truthfulness, but the derivation of all its various parts from one central inspiring Wisdom. And whether with or without the help of versions and commentators, this is the day to examine texts hard to be understood, trying to add to your illustrated Bible a few letters of

light, a few vignettes of beauty. On other days you may take from your store a few current coins ; this day you go down into the mine, and you dig to add to your treasure. On other days you accept your morning portion, and are thankful for your daily bread ; this day you go out into the harvest-field, and gather ears, and bring home sheaves, and bruise for future use heaven's bread-corn. On other days as a hasty pilgrim, you are fain to drink of the brook by the way, but you cannot linger ; this day you lie down beside the still waters,—you draw plenteous draughts from the wells of salvation,—you drink of the river of God's pleasures ; or your exulting soul expatiates in that ocean of truth on whose edge the little children wade, whose depths have not yet been sounded by the seraph with the longest line.

A large and delightful literature is now supplied to the Christian student. Theology has its great thinkers, Pascal, Vinet, Edwards, Chalmers, Foster. The Church of Christ has its instructive, though often mournful story, portions of it well told by Milner, D'Aubigné, and M'Crie. Religious biography is growing very rich in rousing or affecting records, — Doddridge, Martyn, Payson, Venn, Pierce, M'Cheyne, Hedley Vicars, and multitudes besides ; whilst modern missions exhibit instances of self-sacrifice and triumphs of the Gospel over idolatry, crime, and brutish ignorance, in the experience of men like Eliot, Brainerd, Judson, Morrison, Williams, Moffatt, which it is hardly possible to peruse without feeling our love to the Saviour quickened, and our faith in the Gospel strengthened.

But a main ingredient in human nature, and one of the most precious, is the social affections : and the Sabbath is made for the Church and the family. The tendency of excessive toil is to render us joyless, hard, and selfish ; but this timely rest, like a reviving dew, cools the weekly fever, and makes our better feelings expand once more ; and he

must be a churl indeed, over whose wife and children the light of Sabbath does not shed a peculiar endearment, and supply a new motive for an industrious morrow. The tendency of business, also, is to render us sagacious and too often suspicious; but it seldom fosters benevolence. The Sabbath supplies this want. It reveals us to one another in aspects and relations unknown during the money-making, bargain-driving week; and as those meet in the church who parted on the exchange, if in their common profession of Christianity they find new incentives to uprightness and integrity, in the prayers and praises which unitedly they offer they establish a tacit sympathy which even in harsher scenes will retain its softening influence.

Experience is constantly confirming the words of the wise and upright Sir Matthew Hale:—

“ A Sabbath well spent
 Brings a week of content,
 And health for the toils of the morrow ;
 But a Sabbath profaned,
 Whatsoever be gained,
 Is a certain forerunner of sorrow.”

But in order to a well-spent Sabbath, few preparations are so needful as a finished week and a well-spent Saturday. The Saturday is the Sabbath's vestibule; and if late hours, or riotous mirth, or excessive occupation, has absorbed us then, the Sabbath may be well-nigh spent before we get into its sacredness. On the other hand, a week in which engagements have been neglected or postponed,—a week, that is, in which we have not laboured the six days and done all our work,—is a bad preparation for the rest of the seventh. As poor Haydon testifies: “ I always used to remark that the idlest students worked hardest on a Sunday. Call on them in the week, they were never at their studies; call on a Sunday, and you were sure to find them buried in all the grubbiness of dressing-gown and dirty

slippers."* And among those who have too much conscientiousness to ply their ordinary avocation, arrears of work are a heavy incubus on Sabbath enjoyment. Try to imitate the Divine Author of the institution, who finished all His work, and then on the seventh day "rested and was refreshed."

And when the day arrives, seek to be "in the Spirit." It is *the Lord's* day. It would not be here if the Lord Jesus had not been here. It would not be here if the great Redemption had failed,—if the sacrifice of Calvary had been found insufficient for the sins of men, and if the benevolent Being by whom that sacrifice was offered were still a tenant of the tomb. But this morning's dawn, like a continual Easter, announces "the Lord is risen." It tells of atonement accepted; it tells of a Saviour ascended and a church redeemed. Nay, if that Saviour were not coming again, the Lord's-day Sabbath would not be here. But it speaks of a better rest which yet remaineth for the people of God. A relic of Eden that has survived the curse, it is a promise of new heavens and a new earth wherein dwelleth righteousness. It is a prophecy of better things not seen as yet, and no bad test of our own preparedness for them.

" Thine earthly Sabbaths, Lord, we love ;
 But there's a nobler rest above ;
 To that our labouring souls aspire
 With ardent pangs of strong desire.
 No more fatigue, no more distress ;
 Nor sin nor hell shall reach the place ;
 No groans to mingle with the songs
 That warble from immortal tongues.
 O long-expected day, begin ;
 Dawn on these realms of woe and sin :
 Fain would we leave this weary road,
 And sleep in death to rest with God."

J. H.

* Autobiography of R. W. Haydon, vol. iii. 31.

THE FATAL WHISPER.

A WHISPER stole upon the air,
A vague, uncertain sound ;
Loosely it floated here and there,
Sailing and circling round,
Like those light spider-threads that stray
About on a calm summer's day.

Wherever two or three were met,
It, eddying, near them drew ;
And then, as if in motion set
By their lips' breath, it flew
Away to others, that like these
Caught it, and sent it with the breeze.

And thus it sailed and circled on,
A faint and formless thing ;
Yet many felt when it was gone,
It left a trailing sting ;
Such as the swimmer feels when he
Meets the medusa in the sea.

At length it lighted !—round the frame
Of a strong man it coiled :
His eyes, they flashed into a flame,
His bosom heaved and boiled ;
His heart was seized with piercing pains,
His blood was poisoned in his veins.

Against this subtle foe he fought,
But fought without avail ;
Its nature and its source he sought,
But only sought to fail :
Though many knew, yet none would speak,
To tell him where he was to seek.

Could he but trace from whence it came,
He there might find its cure ;
A breath, a hint, a word, a name,
Might health and hope ensure ;
But name, or word, or hint, or breath,
Comes not to shield his soul from death.

His spirits droop, his strength departs,
His flesh falls off his bones ;
Awake, he stammers and he starts,
And in his sleep he moans :
He-shuns the crowd ; and, as he walks
Alone, unto himself he talks.

At last he sinks upon his bed,
Never to rise again ;
One thought runs through his weary head,
And racks his wandering brain :
That Whisper faint, that vagrant sound,
Has brought the strong man to the ground !

The slander of a silly tongue
Broke down a spirit brave ;
Its poisoned folds around him clung,
And dragged him to the grave :
While those who could have saved stood by,
And saw him perish by a lie !

W. M. G.

LUCIFER-MATCHES.

(*Concluded.*)

THE preparation of the inflammable materials, called in France "*pate*," and in England "composition," or in the language of the factory *compo*, is among the arcana of the manufacturers, each of whom has, if not ingredients, at least proportions, of his own. All these compositions, or pastes, may be said to be primarily emulsions, or homogeneous mixtures of phosphorus in a solution of glue or gum arabic; and a large quantity of matches are made in London and other great cities, for consumption among the poor, which consist simply of phosphorus, glue, and colouring matter, being at the same time the most dangerous and offensive.

In the large manufactories of Germany, gum from Africa or Italy is used in place of glue, and a nitrate of lead or peroxide of lead is the chief ingredient besides the phosphorus. These matches will not bear the humidity of our climate. The English manufacturers generally employ glue, phosphorus, and chlorate of potash, in large proportions, and some other ingredients not generally known, which appear to have the double property of diminishing the explosiveness of the mixture, and of giving to the match a hardness and power to resist moisture. The range of phosphorus, in the different dipping compositions, varies very much, in some cases, it may be 30, and even 50 per cent, in others the proportion will be very small,—perhaps as low as 10, or even 5 per cent, but in all it exists in sufficient quantity to render each single match a poison of fearful intensity.

None of the compositions which inflame without ex-

plosion contain chlorate of potash, but nitre and phosphorus, the latter burning, so to speak, at the expense of the oxygen of the former.

The following is one of the many mixtures formerly used for dipping the splint,—

Phosphorus	4 parts,
Nitre	10 ,,
Fine glue	6 ,,
Red-lead, or ochre	5 ,,
Smalt	2 ,,

which is prepared for use in the following manner :—

The glue is broken into pieces and kept in cold water for a few hours, when it is melted in a copper vessel heated by means of a salt-water bath. When it is quite fluid, the phosphorus is gradually added, which ought, however, to be always covered with water. The mass is kept in motion by a pestle furnished with brushes, increasing the rapidity of the agitation as the temperature falls, and at length an emulsion of finely divided phosphorus is obtained. The nitre, red-powder, and smalt, are then added in this order, the mixture being maintained at a temperature of about 100° Fahr. by a water-bath. The whole of the materials gradually form an uniform paste, which then may be almost drawn out into threads.

Gum may be substituted for glue, and prussian blue for smalt, while pure sand is occasionally employed. The mode of mixing and preparing the paste slightly differs according to the material employed as a mucilage.

The splints (to be hereafter described), having been well seasoned and made hot, are put into bundles and dipped into melted sulphur. They are then well shaken, to remove the excess, as so little sulphur is necessary that it is scarcely visible; and when dry they may be re-dipped in the igniting material, which forms the principal part of the match.

The composition and sulphur splints being now ready, the operation of dipping is conducted after two methods, viz., the *bundle dip* and the *frame or clamp dip*. In the first case, the dipper takes a bundle of splints, tied round with string, and grasping it in both hands, by a skilful motion, causes the ends of the splints to expand into so wide a circle that they become detached, and on being dipped each will receive its own separate portion of the composition. By this method it is the end of the match only which is covered with composition, and from the trifling consumption of material, as well as the cheapness of the labour, this kind of match is the least costly in manufacture.

Amorphous, or allotropic phosphorus, is found to answer admirably for this mode of manufacture, so that the cost of using it will allow of its becoming universal. The frame or clamp dip is, however, gradually displacing the bundle dip, at least in this country.

In the other mode of manufacture, the *frames or clamps* consist of separate strips of wood about fifteen inches long, one inch wide, and a quarter of an inch deep, one side of which is covered with woollen list and the other scored with grooves, about five in an inch, and each deep enough to receive a splint. A child will rapidly fill a grooved strip with splints; the list-covered side of a second strip keeps the splints in their places; and by a succession of strips of splints, a frame or clamp is quickly formed, which will hold 1500 or more matches, presenting a surface of about fifteen inches square. When well bound together, these frames full of matches are ready for dipping.

The paste is spread upon tables made of dipping-stone or metal by means of a roller or spatula, maintained at a uniform temperature by the heat of a water-bath. In other cases a slight iron frame, called a *gauge*, is placed on the dipping-table, into which the composition is poured until

full, and thus the *depth* of the dip is regulated. A workman knows by practice how to manipulate the frame, so as to get out of the same "bed" of composition a succession of frames dipped to any equal depth, until at last the quantity removed has so thinned the "bed" that the "gauge" must be refilled.

In one of the extensive Austrian manufactories at a row of six or more dipping-stones half-a-dozen workmen are employed, who dip and hand back the frames to the attendant boy with such celerity that they can turn out the incredible quantity of twenty millions of matches per diem.

The frames, holding (say) 1500 matches, are now placed in a horizontal position, and allowed to dry for some time in the air. After the lapse of three or four hours they are removed to a stove, and suspended from iron railings, where they are exposed to a temperature of 80° or 90° Fahr., by means of steam or hot water. When glue is used, the desiccation is complete in two hours, but it occupies an entire day when gum has been employed as the mucilage. Each set of railings is covered with sheet-iron, to prevent combustion spreading in cases of fire, and the floor of the stove is kept covered with sand, to the depth of several inches, to extinguish any ignited match as it falls, or any which may take fire by the friction caused by the passing to and fro of the workmen.

As soon as the drying process is complete, the frames are carried to a workshop, where women and children remove the matches, and immediately deposit them in boxes. These work-people have always by their sides boxes half-filled with sawdust, in which they plunge any match ignited by accident, so as at once to extinguish the flame. They have also large and small cisterns in which to immerse their hands in case of accident. The phosphorus burn is of a dangerous character, and it ought to be

generally known that nothing is better than a lotion made slightly alkaline with magnesia, or, wanting this substance, with milk of lime, or a solution of bicarbonate of soda, because these substances arrest the acidifying of the phosphorus, on which its corrosive action depends.

The Lucifer without Sulphur.—In making these matches, the wood must be more thoroughly dried than in the preceding kind, especially just previous to the last operation. The splints are placed in the usual frames, and the ends are brought for a moment in contact with a red-hot iron plate, so as to become slightly carbonised. They are then dipped in a thin layer of stearic acid or wax, kept in a fluid state in a flat-bottomed tinned-copper basin, by means of the usual water-bath. A small portion of the fatty matter is immediately absorbed by the ligneous tissues, and rises by the capillary force of the fibres. These ends are then covered by the inflammable paste in the manner already described.

The paste of these matches must contain less gum, and a more active oxydising agent than the other, while the reason of the previous preparation of the wood is necessary, as this inflammable composition burns too rapidly to set fire to the wood—a defect our readers may have noticed. The following is the composition of one of these pastes:—

Phosphorus	6 parts,
Gum	1 ,,
Red-lead	4 ,,
Sand	4 ,,
Water	6 ,,
Nitric acid	1 ,,

The extra cost of the stearic acid is compensated by the much smaller quantity required compared with sulphur, the proportion being as 1 to 10.

Latest Improvement.—The most recent and important improvement in the manufacture of matches is that of Herr

Lundström, of Jönköping, who describes his process as follows :—The matches are dipped in the ordinary way in sulphur, stearine, wax, or spermaceti, and the following igniting material applied in the usual manner :—

Chlorate of potash	6 parts,
Sulphuret of antimony	2 to 3 ,,
Glue	1 ,,

while the following composition is applied to the sides and other parts of the boxes which contain the matches, by means of a brush or small wood spatula, and may be called *the paste for the rubbing or friction surfaces*, previously coated with a compound of grit and cement :

Amorphous phosphorus	10 parts,
Oxide of manganese, or sulphuret of antimony	8 ,,
Glue	3 to 6 ,,

which thus introduces a novel feature into this branch of industry.

Candle or Taper Match, or Vesta.—This kind of match is prepared by machinery, not unlike a weaver's loom, with its warp ready for weaving. Each wick, composed of untwisted cotton, represents one of the threads of the warp ; and 100 to 200 of these wicks, wound off a cylinder, kept separate by means of combs, are carried through a bath of melted wax. They afterwards pass through small holes in a metal plate, which renders the wax uniform and cylindrical throughout the whole length of the wick. A knife, moved by machinery, cuts all the tapers to a given length, and these slips of waxed threads, fixed in frames, are dipped in the inflammable paste, which contains more chlorate of potash than usual. The subsequent operations are the same as in the case of the wood-matches.

The Fusee for lighting cigars is made from strips of pulp or thin card-board, previously prepared by steeping in nitre, and upon which the maker's name is first stamped.

A girl then takes twenty-five strips in her hand, and with a stick, shaped like a paper-knife, spreads a portion of the red composition over the cut extremities of the upper strip, which is then placed on the table, and so on until the whole are prepared. Another girl receives these strips, and twists them so as to separate the fusees from each other, and arranges them upon a tray, which, when full, is placed on a rack to dry.

The general principle involved in the action of these matches, tapers, and fusees, is, that such substances as phosphorus having a strong affinity for oxygen, are mixed with a large amount of this gas, condensed into a small space, as in nitre or chlorate of potash, so that the slightest cause is sufficient to produce a combination between these elements. Red-lead, and some other metallic oxides mixed with the nitre, act in the same manner when they have once attained a red heat, and thus help to continue the oxydising action commenced by the more easily decomposed nitre at a lower temperature. The smalts, prussian-blue, &c., are added for the purpose of colour, while sand and other similar matters are intended to increase the effects of the friction.

Preparation of the Splints. — We have deferred describing this part of our subject until we had given the above brief account of the various kinds of matches formerly or now in common use.

The wood is previously dried much in the same way as timber is desiccated for ordinary purposes, the air being heated as high as 400°. The best pine-plank, as free from knots as possible, is employed.

Complicated machines have been devised for preparing the splints for the manufacture of the matches, one of which those readers who wish for drawings and more details will find in Armengaud's "Publication Industrielle des Machines Utiles et Appareils."

Most of the arrangements include a system of knives or cutting edges, arranged according to the thickness of the splint. In one of these machines the planks are cut across the fibres, by means of a circular saw, into twenty-eight or thirty blocks, each measuring thirty inches long, four and a half inches wide, and three inches thick, which are cut into splints in the following manner:—A frame is attached to the extremity of the horizontal arm of a crank, which gives it a reciprocal motion through a space of about fourteen inches. In this frame are fixed, in a line, some thirty or forty lancets, with the points projecting upwards, and separated from each other by pieces of brass. The block of wood to be cut is inserted by the small end between uprights, and a lever placed upon it, forces it down to such a position that as the lancet-points advance the end of the wooden block is cut or scored in the direction of the fibres with as many lines as there are lancets. As the lancets are withdrawn, by the motion of the crank, a scythe-blade, moving in a horizontal plane, swings round and cuts off the end of the block to the depth of the scores made by the lancets. The pieces thus cut off are four-sided splints. When the horizontal knife swings back, the block from which one layer of splints has thus been removed descends through a space equal to the depth of the section; the lancet-points again advance and recede, and the knife again does its work.

The Boxes.—Manufacturers have also entered into a spirited competition in the character and embellishment of the boxes for containing the matches. Card-board, wood, and metals, all being taxed for this purpose, and every form of device has been adopted to meet the wants of travellers and others, even to making walking-sticks with hollow heads; or, to adopt the language of another, the boxes are cylindrical, vertical, oblong, hexagonal—some open like a pocket-book, some like a telescope, some like a

cigar-case, some like a snuff-box ; in some a mouse is crouching over a recess containing the matches, while in others General Tom Thumb's head is moveable, and reveals the matches beneath.

The Statistics of the Trade are almost fabulous, when we remember that we can only date its simultaneous introduction into different countries from the year 1834. They were first manufactured on a large scale in Hesse Darmstadt ; and the extension was slow and gradual, as some of the other States either controlled or prohibited their introduction, on account of the supposed increased danger from fire ; of which Mr. Braidwood, perhaps, will give us some particulars in his next paper before the Society of Arts.

This manufacture has, however, fairly outstripped the measure of ordinary figures, and what follows will convey a faint idea of its magnitude.

In the Report of the Jurors of the Exhibition of 1851 we find it stated, that from 1848 to 1850 the *weight* of matches exported from the Elbe had increased more than *sixfold*, the quantity in the latter year being 1860 cwt. ; but we know that at present one importer of matches in London, who does not receive a single case from the Elbe, imports more than four times that quantity, or, on the most moderate computation, 8000 *cwt.*, equal to 1000 *tons of shipping* — this article being bulky and light.

In the printed official export list of the city of Hamburg for 1854, it appears that 9053 cases of matches were exported, of which nearly 3000 came to this country, and the declared value of which was about 20,000*l.* We thus find that this *trifle* figures in the exports of the great free German city to the tune of 50,000*l.*, of which, strange to say, she sent 14,000*l.* worth to *Australia and the Sandwich Islands*. Now, if we allow an increase of one-fourth only on the British imports from the Elbe, we get a sum of

25,000*l.*, while that from the Rhine is certainly not less. To this we must add 10,000*l.* for the present very large imports from Sweden, which then carries our little account for imports of matches into Great Britain up to 60,000*l.* value per annum, and reducing value into quantity, we arrive at the astounding fact that we are buying from our foreign neighbours 200,000,000 *of matches every day*. One is tempted to exclaim, Cannot Mr. Mayhew suggest to his interesting ticket-of-leave friends this field of labour? and, surely, our ragged-school and workhouse officials ought to go in and possess this land of labour. But to proceed; our correspondent estimates the comparatively insignificant and little extended home manufacture at 40,000,000 per diem, making the domestic and foreign consumption approach 250,000,000, and assuming none are re-exported, it amounts to more than *eight matches per day per head of the whole population*. This result agrees very nearly with information supplied from Belgium, where the manufacture of matches, and the consumption of materials, is in few hands, and would show a daily consumption of nine matches per head for the entire population.

Our friend, Mr. Albright, says, "It is not easy, in dealing with such numbers, to be sure of being correct; but we estimate that a moderately economical use of the total production of phosphorus would furnish five to six matches per head per diem for the world's population. About ten years ago we recollect being besieged in the streets of Pera (Constantinople) by itinerant vendors thrusting their boxes of matches into our faces; and believing that the *lucifer-match* is one of the first products of manufacturing industry carried by commerce to barbarous lands, we think that five matches a-head per diem for the world's population is much more reasonable than at first sight it appeared even to ourselves."

We have stated that this manufacture is comparatively small in this country; yet, small as it is, the consumption of phosphorus is about eight tons, and of chlorate of potash nearly twenty-six tons — certainly an enormous weight, merely to tip the ends of a match.

We will try to illustrate this trade by what Mr. Dod says of one single saw-mill in London, which cuts up annually 400 large timber trees into splints for matches, which are sold to the makers *by hogsheads*. A consignment to a single Bristol manufacturer on one occasion, consisting of thirty hogsheads, which turned out

15,000 bundles of boxes,
1,080,000 boxes,
54,000,000 matches!

Another gentleman, a few years ago, examined before the Children's Employment Commission, stated that he used 1000*l.* worth of American pine yearly in making boxes, and he estimated the *weekly* production in London at 12,000 to 15,000 *gross of boxes*. Each box contains fifty matches, which would thus raise the annual production of the metropolis to 5,000,000,000 of matches.

The writer of an interesting description of one of the London works tells us, that the waxen-cord cut up yearly into vestas by this single factory would, if undivided, stretch from England to America — *and back again*.

Perhaps the most perfect idea of the extent of this branch of our home manufacture is to be gathered from the account given of Messrs. Dixon's works, at Newton Heath, in the "Daily News." This firm consumes one ton of sulphur per week, and last year worked up between four and five tons of chlorate of potash and twelve tons of glue. Their mill is worked by steam-power and by machines of extraordinary velocity. About three hundred people are employed on the premises; and as a great quantity of work

is sent out to be performed by women and children in their own cottages, probably not fewer than four hundred and fifty to five hundred persons are maintained by work from this firm.

The timber-yard, in which the material is piled up awaiting its turn for the saw, is from two to three acres in extent, and is covered by the huge trunks of American red and white pine, worth on an average, in its various stages, about 10,000*l.* They often purchase 7000*l.* to 8000*l.* worth at a time. Occasionally they send an agent over to Canada or Norway, to buy the wood in the plantations, though generally it serves their purpose quite as well to attend the Liverpool markets, and make their purchases nearer home. Only fancy a maker of matches sending out his agents to foreign countries and distant colonies to examine the living forests, with a view to their being purchased, cut down, sent over to England, and finally converted into lucifers !

This fact, perhaps, conveys a grander idea of the colossal scale on which the Messrs. Dixon manufacture than even the following figures, which are copied from the weekly stock list. The average daily production of the finished article fluctuates between 6,000,000 and 9,000,000. The more certain average of the week is 43,000,000 ; so that, allowing two full weeks in the year for holidays (and the persons employed in making congreves, or lucifer matches, need all the play-days they are ever likely to get in this country), the produce of the remaining fifty weeks will be no less than the astounding number of 2,160,000,000 matches in the year. Taking the population of these islands at 30,000,000, there are 72 matches for every man, woman, and child ; and supposing each match to measure $2\frac{1}{4}$ inches in length, they would cover the whole surface of an English county ; or, laid out longitudinally, would far more than put a circle round about the earth.

We discern, however, some symptoms that we are becoming independent of our foreign friends, especially in the production of the important article of phosphorus; thanks to the skill and enterprise of able manufacturers amongst ourselves, whose operations commenced in 1845—as the following table of imports of phosphorus most clearly shows:—

In 1842	value imported,	£1162
1843	„ „	2370
1844	„ „	2567
1845	„ „	1499
1846	„ „	631
1847	„ „	572
1848	„ „	180
1849	„ „	122
1850	„ „	3

It is, however, to the Continent of Europe that we must look for the most surprising illustrations of the extent of the manufacture of this little companion of our civilisation. There it is scattered from the frozen Gulf of Finland to the melting climate of Andalusia, and from the great inland lakes of Sweden to the Carpathians of Transylvania, and the shores of the Bosphorus, from where,—

“Lapland’s founts and lakes arise,”

to the land,—

“Where the Moorish horn once proudly rung,
Through the pealing hills of Spain.”

It appears to have taken its greatest development in Austria, where two of the leading manufacturers will consume not less than 20 tons of phosphorus! and give employment to no less than six thousand hands. It forms the most important item of its trade with Chili. We give the *weight* of the export of matches from Trieste in 1849, to illustrate the state of the Mediterranean markets; thus:—

Turkey . . .	took	1226	cwt.
Greece . . .	„	596	„
Malta . . .	„	492	„
Egypt . . .	„	382	„
Ionian Islands .	„	336	„
Naples . . .	„	225	„
Other countries	„	530	„

or, in round numbers, nearly 200 tons; and the entire production of this empire was estimated at 50,000 cwt., of which one-fifth was exported.

The production in France is also on a very large scale: Paris alone employing 1000 work-people; while the annual quantity manufactured is estimated at 990,000,000 boxes of matches, worth 72,000*l.* The quantity of phosphorus made in this country and France may be estimated at no less than 300,000 lbs.

Turning to Sweden, we find one of the numerous manufacturers there, who has recently taken the patent to which allusion has been made, stating:—“This manufactory was established in 1848, and employs at present about 400 workmen. The machines for cutting the matches are moved by a six-horse engine, with a daily production of about 8,000,000 of matches.” This quantity has since increased to 10,000,000; and this manufactory is only one of half-a-dozen or more, whose Swedish “Tandstickor” label, and other unpronounceable names, figure on neat little boxes in all the towns of England.

The Cheapness of the Lucifer.—This enormous production, in a great measure, prepares us for some curious facts as to the cheapness of the lucifer. A certain Peter Harass sells his plain boxes at *twopence* per 100, and 1400 splints for *one farthing*. Fürth, in Bohemia, sells his cheapest boxes at *one penny* per dozen, each box containing 80 matches; but De Majo, in Moravia, almost fulfils the ideal of the auctioneer’s cheapness, “Less than nothing;”

and would certainly be "King of the fair" on "Penny-packing-day," for he sells a case of 50 boxes, each containing 100 lucifers, for fourpence.

The Disease of the Lucifer.— We now come to an unfortunate attendant of this trade, which attacks the work-people in some manufactories in the form of a frightful disease. It commences with toothache, is followed by decay in the jaw-bones, pieces as large as peas working themselves out, until the lower jaw, in some cases, entirely disappears. We give an account of a young girl of twenty years of age, of pale and scrofulous aspect. She went to work at the lucifer-factory when she was nine years old, and after she had worked for about four years, the complaint began like a toothache. Her teeth had all been sound before that time, at any rate had not troubled her by aching. She was occupied in putting the lids on the boxes. She could smell the phosphorus at first, but soon grew used to it; at night she could see that her clothes were glowing in the chair where she had put them; her hands and arms were also all in a glow. She used to wash her hands, and attend to cleanliness. On uncovering her face, we perceived that her lower jaw was almost entirely wanting, and at the sides of her mouth were two or three large holes. The jaw was removed at the Infirmary seven years ago.

In France, where the consumption of phosphorus is very large, there has been a fearful development of the disease, which has attracted great attention from the Imperial Academy of Medicine, the Conseil d'Hygiène, and Government Commissions; which, it is hoped, will end in the adoption of,—

The Remedy.—In the suppression of the old phosphorus and its substitution by the new kind or amorphous phosphorus, for which some of the leading Paris manufacturers have already presented a petition.

This curious modification of phosphorus was first discovered by Schrötter, of Vienna, who found that if ordinary phosphorus was subjected to a temperature of 480° or 500° for some time, it acquired a red colour, was no longer fusible, volatile, inflammable at low temperatures, nor poisonous. As it may, therefore, be handled without danger, and evolves no fumes in the atmosphere, we believe it offers a certain preventive, and leads us to thank that gracious Providence who has so ordered events that the cure is at hand.

In concluding, we think there can hardly be less than 50,000 persons employed in the manufacture of lucifer-matches, of whom a large number are children and young people, more or less exposed to the inroad of this hideous complaint. However much the evil has been mitigated in this country by the care and precautions of the manufacturers, as well as by the employment of a large proportion of chlorate of potash, there does not appear to exist a doubt in the mind of thoughtful masters of the great benefit which would arise from substituting the amorphous for the old forms of phosphorus. Among many similar testimonies communicated to the patentee of the new phosphorus, we select one from Mr. Hynam, Finsbury, London, who writes, "I am convinced that it will be of great benefit to all the manufacturers as well as the public in general. I should like to see it in general use." And another from Mr. Dixon, the senior partner of the firm at Newton Heath, who says, "There can in our opinion be little doubt but that this material (amorphous phosphorus) is the fore-runner of vast improvements in match-making, not only in reference to the health of those employed in the production of them, but also as regards the offensive effluvia arising from the composition now in use to the general consumer."

To rescue thousands of persons from working in an

atmosphere too often absolutely luminous at night with the vapour of phosphorus, and by a change so simple that it will not only involve no additional alterations nor trouble to the manufacturer, but really diminish some present difficulties, is certainly worth an effort on the part of our leading philanthropists.

Nor is this solely a question affecting the health and lives of the workpeople. It is impossible that in every room of our houses, boxes of highly poisonous matches can be left without any precaution, without occasioning fatal accidents. Our coroners' inquests have already recorded the death of children from this cause; and, doubtless, many have perished from similar accidents, without its ever being traced to the true source.*

* A remarkable case of poisoning was lately detailed in "La Presse," by M. Figuiet.—At Cambrin, in the Pas de Calais, two individuals went into a *cabaret*, and asked for a cup of coffee. Scarcely had they swallowed the contents, when they dropped over on one another dead. The woman who kept the *cabaret*, in great excitement, ran and apprised the authorities. Suspicion of having poisoned her guests at once alighted on herself. She protested that they had tasted nothing in her house except coffee, of which there was still some in the coffee-pot on the fire; and to show how good it was she filled a cup for herself, drank it, and soon fell dead beside the two corpses. On examining the coffee-pot, there was found in it a box of lucifer-matches!

The most important medical work on this disease gives us the following melancholy facts, and which loudly call for Government interference:—

"Of 100 workpeople employed in 3 manufactories at Vienna, 22 were attacked by *necrosis of the jaws*. Of 68 cases reported, 15 recovered, 15 died, 15 remained under treatment, and the others are not known.

"In one manufactory at Nuremberg, where 60 or 70 persons were employed, there were 15 cases of disease and 8 deaths!

"There have also been numerous fatal cases in Sweden, France, and England."

While this article is in the press, it has come to our knowledge that in one manufactory, near London, two young men (not of dissolute habits) both died in the course of four or five years, from the effects of their employment in dipping lucifer-matches.

In France, the medical societies have been occupied with this question, on the ground of the cases of murder and suicide in which phosphorus matches have been the agents employed,—an agent the more to be dreaded, because, as they truly state, it is impossible to distinguish it by any chemical test afterwards, from the phosphoric acid and phosphates so generally present in the organs and tissues of the body.

The Academy of Medicine have, in fact, submitted to the French Minister of Commerce, a proposal for the suppression, by authority, of the use of common phosphorus, and for the employment of which, there is now no longer any excuse, since M. Lundström's discovery has been made public. The Jury of the Paris Exhibition have stamped the use of this amorphous phosphorus with their approbation by awarding silver medals to M. Lundström, and M. Camaille, match-manufacturer of Paris, and Mr. A. Albright of Oldbury, the patentee of this article, and the gold medal to the discoverer, Prof. Schrötter of Vienna.

In the hope that this will soon become generally adopted, we think we may fairly claim for *our Lucifer* the character we ascribed to it in our prefatory remarks, while we believe no other invention of modern times has so quickly reached its present state of perfection, nor attained so wide a diffusion among the nations of the earth, carrying its conveniences equally to the poor and the rich.

T. R.

THE HILLS.

UPON the hills, upon the hills!
The ever fresh and free !
To bound along with the living breeze
That blows so joyously!
What a thrill of youthful vigour
Its magic breathings give !
In life's thronged vale I do but move,
Upon the hills I *live*.

Oh ! for a painter's hand
To catch the gloom or glow,
Which sun and shade alternately
O'er the boundless prospect throw !
The dark-brown heath, the glistening fern,
The whortle's golden green,—
The aged thorn, the copsewood oak,
And the lights that shoot between,—

The tricolor polygala
That springs beneath my feet,—
And the golden-vested tormentil
That spangles the turf so sweet ;—
My earliest childhood loved
To gather these fair flowers,
And I love them still for their own sweet selves,
And the memory of past hours.

Upon the hills, the mighty hills,
On every side that rise ;
Their bases in the ocean,
Their summits in the skies !

Symbols of power majestic,—
Relics of ancient Time,—
With each ascending footstep
My spirit seems to climb!

And must I quit your freedom,
And fettered toil again
Amid the dull routine of life,
The crowded haunts of men?
Yes, Life is not for rapture,
But for willing self-denial,—
For Faith and Love and Righteousness,
Still perfected by trial.

Then onward! in well-doing
Tread selfish visions down;
Not indolent emotion,
But patience wins the crown.
And when wearied in life's battle,
Let the thought of hours like these
Refresh thy fainting spirit
As the fanning of the breeze.

But chiefest onward, upward,
Be fixed thine earnest sight,
Where rise the Everlasting Hills—
Where spreads the Infinite!
Upon that new creation,
Where the pure in heart shall see
That Goodness perfected is Bliss,
And Truth is Liberty.

H. S. E.

OURSELVES.

NUTRITION (*continued*).

No part of the intestinal canal lies quite free and disengaged in the cavity of the abdomen. The whole of it is fastened by suitable folds of the lining membrane, which prevent implication and injury. One of these folds, fan-shaped, is called the *Mesentery*. To its outer edge the small intestines are attached, like the hem on a frill. Its inner edge is fixed to the backbone. In this way their integrity is secured from any, but extreme, violence, and yet no hindrance or restraint is offered to a vermicular movement of the canal termed the *Peristaltic action*, by which the food, during its various stages of change, is steadily and regularly moved onwards. Between the membranous layers, of which the mesentery is formed, the arteries and veins pass which supply the intestines with blood, the intestinal-nerves, and a set of delicate tubes called *Lacteals*, among which are distributed, pretty numerous, the *Mesenteric* glands.

The Lacteals form part of an important system of vessels, known under the general term of *Absorbents*, which are found in almost every part of the body, excepting the brain. With them the reader is presently to be made acquainted.

Before adverting to them, however, more particularly, it is necessary to notice the *Liver*, as that is next in succession in the order of digestive organs. This large gland—the largest in the human fabric—occupies the upper part of the cavity of the abdomen, on the right side, under the ribs, where it is suspended and retained by several strong ligaments. In adults its weight varies from two to five pounds. It is unsymmetrical in shape, of a brownish-red colour, com-

pact, but not firm, and, on this account, is easily torn. It furnishes the *Bile*. Notwithstanding the pains taken by anatomists and microscopical observers, its intimate structure is still unknown.

Attached to the under surface of the Liver is a small pyriform reservoir, called the *Gall-bladder*,* which receives and retains a certain portion of the bile for occasional use.

Both the quantity and quality of the bile differ a good deal in different persons; and in the same person under different circumstances. It varies with climate, season of the year, and from temperature alone, and during every day, with reference to the taking of food. The largest quantity appears to be poured out from about twelve to thirteen hours after eating. In a healthy adult, the quantity furnished, in twenty-four hours, ranges from seventeen to thirty ounces. Berzelius says:—

1000 parts consist of water	.. .. .	907·4
„ biliary matter..	.. .. .	80·0
„ mucus	.. .. .	3·0
„ alkalies, especially soda..	.. .. .	9·6
		1000·0

He and Liebig differ a good deal about the chemical state in which these ingredients exist.

Another of the viscera, auxiliary to the function of digestion, is the *Pancreas*, which lies behind the stomach, and across the spinal column. It is about six inches long, and from two to three inches broad. In structure, and function too, it is almost identical with the salivary glands. Like them it pours out a large quantity of fluid during the process of intestinal digestion. The duct, which conveys

* Not unfrequently, and *probably in consequence of insufficient exercise*, depositions from the bile occur in this receptacle, and gall-stones are formed. Mr. Abernethy used to mention, in his lectures, that he had found more than 1500, of different sizes, in one gall-bladder.

the *pancreatic juice* into the intestines, enters, like the bile-duct, in a slanting direction, and terminates, close by it, in the duodenum; the first portion of the intestines, not far from its junction with the stomach.

To the upper part of the abdominal cavity, on the left side, opposite to the liver, and contiguous to the stomach, the *Spleen* is attached. It is a sponge-like viscus of a blueish, almost livid, colour, and seems to consist of a congeries of blood-vessels enveloped in a membranous covering. Its use is not known. Animals bear its removal without seeming injury. The most probable conjecture affixes it as directly subordinate to the stomach. When that is full, the spleen becomes compressed and emptied; when the stomach is lax and empty, it becomes turgid and distended with blood.

The reader has now been made acquainted with the names, at least, of the different organs engaged in the process of digestion. A detail of the experiments and suggestions, reasonable and unreasonable, which have been made to explain the process, would almost furnish a series like the Thousand and One tales in the "Arabian Nights;" some amusing, some clever, and some stupid.

Accident, experiment, observation, and the investigations of comparative physiologists, have enabled us to trace the successive changes which the food undergoes; to ascertain in some degree the part which each organ fulfils, and to note the stages at which each change takes place. But the chemistry of life is so very subtle; we are so imperfectly acquainted with its refined and complex transactions; and so ignorant both of the nature and amount of that vital influence*

* Dr. Haighton divided, in a dog, the eighth pair of nerves: those with which the stomach is chiefly supplied. The dog continued to take his food as well as before, but showed manifest signs of sickness and disquietude. He wasted and became almost a skeleton. After a time (as it seemed, in consequence of the nerves becoming united), he improved in health, digested his food, recovered his flesh, and got quite well again.

which directs and modifies its agency, that, of any clear and satisfactory explanation of the true and intimate nature of the process, we are still destitute.

Soon after its reception into the stomach, the food begins to be changed. Its different ingredients lose their special qualities; become defended from the ordinary changes, such as putrescence, fermentation, and rancidity, to which they are otherwise liable, and are gradually converted into a soft pulpy mass, technically called *Chyme*. This conversion is chiefly, if not entirely, due to the *Gastric juice*,* which exudes through numberless pores on the inner surface of the stomach. The chemical qualities of this remarkable fluid, in as far as they are comparable with those of other resolvents, throw no light on its singular powers. It is slightly acid; and beyond that little is known respecting it.

The power which the gastric juice possesses of reducing the food into pulp, is curiously limited, by the nature of the food on which any particular species of animal naturally feeds. Spallanzani found, in very numerous and often-

* Much importance used to be attached to the high temperature maintained in and about the stomach, and neighbouring viscera, by the large quantity of blood in their blood-vessels; and hence, the term coction was, at one time, synonymous with digestion. The peristaltic action of the stomach itself, and the alternating movements occasioned by respiration, &c., were also thought to render important assistance. But it does not appear that either of these are accessory circumstances. Animals having cold blood, digest often faster than the warm-blooded;* and the experiments of Dr. Stevens, made by introducing into the stomach hollow perforated silver balls, enclosing different articles of food, pretty satisfactorily show that mechanical force, of any kind, has little or nothing to do with the process.

* A *due* degree of temperature, however, facilitates even artificial digestion. It has been found that in a constant heat of from 96 to 105°, the resolution of many substances goes on most readily.

repeated experiments, that, if taken from the stomach and put into glass vessels, it produced, when kept at the usual temperature of the animal, changes in all respects like those which occur in natural digestion. What was taken from animals which fed only on flesh, dissolved only animal substances, leaving vegetable matters untouched; while that which was taken from herbivorous feeders acted on grass and vegetable substances, without producing any effect on flesh; and if taken from those which, like men, are omnivorous, it seemed to act with equal vigour on both sorts.

The alteration which the food undergoes does not proceed equally through its whole mass at the same time, but takes place chiefly, and at first, on that part which lies in immediate contact with the stomach. This portion being subdued, is passed on into the intestines, without being detained until the whole is changed.

There is a good deal of difficulty in determining the length of time required for digestion, not only in different persons, but in the same person in different conditions. Some circumstances hinder, some hasten it. It varies with the quality and quantity of the food; with the amount of its previous mastication; the age of the person; the state and strength of the digestive powers, and in some degree, with the immediate requirements of the system. We may state, however, generally, that the chyme passes the pylorus between three and six hours after a meal. Such portions of the food as are not properly subdued, on becoming presented at the pylorus, are repelled back by a reverted, or anti-peristaltic movement of the stomach, to undergo a still farther and more complete resolution.

After passing through the pylorus into the duodenum, the chyme becomes diluted with the pancreatic juice, which is poured into the intestines through an orifice common to it

and to the bile. Besides diluting the mass, the pancreatic juice is thought to have a good deal of influence in forwarding its decomposition.

Though the constituents of the bile have been ascertained with considerable accuracy, its chemical action is still obscure. Little by little as it becomes mixed with the chyme, it appears to educe from it a thin milk-like fluid, termed *Chyle*; and to precipitate the feculent parts, which pass on into the large intestines for subsequent detrusion. The chyle is an epitome of our food. P. S.

DIVINE THOUGHTS IN THE FACTS OF CREATION.

No. I.

THE Universe is a thought, embodied in a fact,—a grand thought, embodied in a mysterious and overwhelming fact. We propose to reverse the process of which Creation is the mighty result, and to *re-solve* outward phenomena into the underlying ideas of which they are the significant symbols. In a true scientific spirit, without at all pretending to a rigorous scientific method, or to the minuteness and fulness of scientific detail, we shall survey some portions of the wide domain of physical inquiry, in order to show that we are encompassed on every side, not more truly with objects for the senses, than with ideas for the intellect.

THE SPHERE OF ASTRONOMY,

to which we turn first of all, offers striking illustrations of embodied Divine thought. In this sphere, there are before us, 1. Our own Planet; 2. Our Planetary System; and 3. The vast concave of Stars.

The Earth's nearly circular form, its inclined position, its

daily revolution on its own axis, and its annual wandering around the central sun, comprise the leading facts of its planetic constitution. Two, only two, of the ideas which are uttered articulately in these facts, we shall take forth; these are, the fitting and wise distribution of light, and the fitting and wise distribution of heat.

First.—The Divine Idea in the peculiar constitution of our planet, is, a fitting and wise *distribution of light*.

The sun is the fountain of light, the sole fountain, to our earth. Between the source and the object on which the supply is to descend, there intervenes the terrestrial atmosphere. The refracting power of this medium need not here be named; but one of the patent and essential uses of the atmosphere is to act as a conductor and reflector of light.

The form of the earth necessitates that only one side, larger or smaller, of the sphere, can be presented to the rays of the sun at a time, the other side being in darkness. The diurnal motion of the earth on its own axis is every moment withdrawing one portion of its surface from the sun and presenting another to his rays. If the relative position of the earth to the sun were always the same—if the sun's light fell always perpendicularly on the equator, days and nights all over the world would be equal, and always one equal half of the globe would be in light, and the other in darkness. But the inclination of the earth's axis, together with its spherical form, causes that, in its annual circuit around the sun, different portions of its surface are at different times presented to the light. At one period of the year, the direct light falls day after day on a part of the surface farther and farther north of the equator, and in the northern hemisphere the days are proportionally and increasingly lengthened. Having reached its farthest northern limit, the direct light declines successively, the days proportionally shortening, till again it falls perpendicularly on

the equator, and days and nights are equal. An exactly opposite course then commences. The direct light falls on a part of the surface farther and farther south, the days in the southern hemisphere lengthening, while those in the northern hemisphere increasingly shorten. Having reached its farthest southern limit, the direct light again successively declines till it once more reaches the equator. The facts now named, which readily explain the unequal length of days and nights throughout the year, also account for a distribution of light peculiar to the Polar regions of the globe. When the sun is in the southern hemisphere, as we speak, the northern polar regions, in consequence of the inclination of the earth's axis, can receive no portion of his light, while to the southern he never entirely disappears. The one enjoy a day extending over nearly half the year, and the other endure a night equally extended. In the same way, when the sun is in the northern hemisphere, the northern polar regions have their six-months day and the southern their six-months night. But this remarkable peculiarity occurs in quarters of the globe, which from other causes are nearly uninhabitable. The northern polar regions have but a scattered and scanty population, and the southern show only a wide wild waste of waters.

Over the *habitable* globe, there prevails the beautiful and beneficent economy of successive day and night. What is beautiful in the arrangement need not be dwelt upon, but its adaptation must not be overlooked. It is, indeed, the necessary effect of the laws of the planetary system; and unless our globe had been an exception in its form and in its movements to all the other spheres, it could not have been otherwise. But we mark, nevertheless, how strikingly the arrangements of the earth as a planet are adapted to the constitution of its organic inhabitants. If *it* was not made for them, *they* at least have been made for it. The effect of

the planetic laws of our globe being what we have marked, we find that only such vegetables and animals exist on it as need the daily alternations of light and darkness, as are invigorated and refreshed by them, and indeed could not survive in their absence. All things grow and thrive in light, and yet need the rest of darkness. The mighty stars, indeed, the sun and the globes that wheel around him, know no night, no pause from labour, and even on the earth itself the processes of organic life go forward without intermission. But for man and for beast, for all orders of terrestrial animals, and not less for the vegetable creation, the interval of repose and quiet is essential. They sleep, that they may wake up refreshed and braced for new efforts. Tired nature seeks a kindly and restorative influence, and the sun withdraws for a time, that the influence may be enjoyed with every advantage. There is, in short, an idea underlying the outward phenomena—an idea not more profound than beneficent.

Besides the direct supply of light from the sun, our earth receives his reflected radiance through the medium of her faithful satellite, when the great luminary himself has sunk in the west. The monthly pilgrimage of the moon around the earth is familiar. The cause also of her changing phases, as she now waxes and now wanes, is hardly less familiar. When our earth comes between the sun and the moon, the movement of the moon not being exactly in the plane of the earth's motion, the sun's light falls directly on the satellite, and we behold her full lighted hemisphere. As the moon pursues her course nearer and nearer the sun, a larger and still larger portion, successively, of the lighted circle, is turned from us, and a larger and still larger portion of the unilluminated circle is turned towards us. We see half, then a quarter only, till the moon coming between us and the sun, the lighted circle is entirely to-

wards the sun, and only the unilluminated is towards us. As the moon, however, pursues her course from the sun, a larger and still larger portion, successively, of the lighted circle is turned to us. We see a quarter, then a half, till again the earth is between the sun and the moon, and we behold her entire hemisphere lighted up. It would be presumptuous to imagine that we know all the uses in the economy of the universe, or even in relation to our earth, which the moon is designed to serve. One thing seems certain, from the decisive fact that no atmosphere exists around this orb—not to name other confirmatory circumstances—that it cannot be the habitation of organised beings. Its functions, in reference to our earth, are imperfectly understood. Its effect on the movement of the ocean, indeed, has long been known; the tides of all seas are found to rise as the moon reaches the meridian, visible and invisible to us; that is, every twelve hours. What influence it may exert on weather, on climate, on the seasons, and on the fertility of the earth, is wholly unknown: but its effect in modifying the darkness of the night is palpable as it is delightful. To all seeming, this is the principal end which it serves, and the idea is confirmed by the analogy of the other planets; for according to their distance from the sun, they, too, are furnished with numerous satellites. The thought—the divine thought—is to minister not to the necessities only, but to the convenience and enjoyment of the world's inhabitants. A bountiful Wisdom grudges not an express provision for tempering the necessary effect of the earth's rotation.

QUÆRENS.

LIFE, IN ITS HIGHER FORMS.

No. IV.

BIRDS.

EVERYBODY loves Birds. The pinafores schoolboy dares the awful frown of the pedagogue, and his birch too, that he may peer into the brambles and hedgerow-trees, for the callow young which he desires to rear. The fair maiden teaches her pet canary to hop on her finger and take his sugar from her own sweet lips, bestowing on him the kisses which many a bigger biped would be proud to share. The solitary weaver, grey with premature age induced by ceaseless toil, hangs his thrush in wicker outside his shattered casement, and throws his shuttle more blithely as he listens to the mellow notes which carry him back to the fields and groves of his boyhood. The weather-beaten sailor greets the little land-bird with a hearty welcome, that flutters on feeble wing around his ship, clinging to the shrouds and stays, and loves the tiny messenger that tells him of his approach to his native shore. The world's care must have indurated that heart, indeed, that can hear without a gush of emotion the sweet melody of a singing bird!

We must not, however, just now consider the Bird as a loveable little pet, but look at it physiologically as an animal;—as one of the meshes in the grand net-work of organic existence. We call it a biped, but structurally a bird is a quadruped. Look at a plucked pigeon, and see how it differs in the matter of limbs from a skinned rabbit, except that the fore legs have no feet or toes at their tips. After all, the pensioner's child who respectfully submitted

that "mother didn't like always to have the *hind leg* of the chicken," was not so far wrong. The bird is, in fact, a quadruped adapted for flight. To this end the fore limbs are greatly lengthened and strengthened, as to them is assigned the office of beating the air by successive strokes, and thus impelling the body through that fluid, as a boat is rowed by oars. Flying, like swimming, is but rowing *through* the medium, instead of *on its surface*.

In order to make these limbs effective, to render them capable of long-sustained energetic action, they must be moved by stout, dense, and powerful muscles. Every one knows that the most fleshy part of a bird,—and especially of a flying bird, such as a pigeon, as distinguished from a running one, such as a fowl,—is the mass that lies on the breast-bone. Now this mass of flesh, or rather these masses, one on each side, are the great pectoral muscles, one end of which is inserted on the broad surface of the breast-bone, and the other end is spread along the bone of the shoulder or upper-arm. For the attachment of these great muscles, there must be a great breadth of surface; and see how skilfully this is provided in the form of the breast-bone! It is a firm buckler of great width planted across the viscera, while, as even this extent would not have been sufficient, the surface is greatly increased by a high keel or ridge of bone that rises from its centre, to each side of which the muscles are attached.

But the stroke made by such a limb, however muscular, upon the air, would be comparatively powerless as a means of locomotion, if that limb were in the condition which it presents when the cook puts the bird on the spit. The breadth of the oar and its hold upon the element through which it is to move are, therefore, increased by a most admirable contrivance. The *quill-feathers*, inserted along one edge of the arm, and radiating outwards and backwards,

like a fan, answer the purpose proposed. Just look at the quill-feather from a bird's wing. With how small an expenditure of material is a broad surface obtained! How slight and apparently feeble is the structure, when examined fibre by fibre; and yet how firmly and compactly it binds together, and how strongly the expanded web resists the air! Breadth, strength, and lightness, were the requisites, and, incompatible as they might have appeared, they are here exquisitely combined.

Even such instruments as these, however, would not avail to lift the animal from the earth, and to bear it with ease and rapidity through the thin air, were its body of the same density as that of a quadruped. It must, therefore, be made buoyant, and this buoyancy is secured by several concurrent ordinances. In the first place, the whole of the muscles are abundantly supplied with blood, which passes through a heart of four chambers, with a rapidity far greater than that which obtains in terrestrial animals. Secondly, to supply the oxygen which is required for the vitalising of this swiftly circulating blood, a peculiar system of respiration is required. The lungs are very large,—spongy masses of blood-vessels lying along each side of the back-bone, and bound down to it: through these the *bronchi*, or divisions of the windpipe, pass; and opening into the general cavity of the chest, admit the air freely into every part of the interior: nay, more; the atmospheric air bathes every blood-vessel of any considerable size throughout the body, passes into the hollow bones of the limbs, and even penetrates between the muscles, and into great membranous cells beneath the skin.*

* This peculiarity was once brought strongly under our own observation in the case of a pelican (*Pelecanus fuscus*), which we were dissecting. The whole inner surface of the skin on the trunk was cellular, especially on the breast, forming an immense congeries of membranous bladders,

The consequence of this copious supply of oxygen to the blood, not only in the lungs, but in every part of its course, is a great increase of its heat, which far exceeds that of the most warm-blooded quadruped. The heat pervading the whole of the animal tissues is communicated to the air, which, as we have just seen, is so extensively distributed about the body; and thus the bird is not only rendered light by being blown out with air, but that air is brought up to a very high temperature, and so rarefied, and made very buoyant.

The animal heat thus generated must not be allowed to escape too rapidly; and hence a body-clothing is provided, which of all substances is perhaps the most effective non-conductor of caloric. A feather is in itself a study. When we look at the whole covering of a bird, we cannot help observing how soft, how light, how smooth, how compact, how warm it is; and if we examine each feather separately, there is not less to admire in the details of its structure. It consists of two parts; a light but firm *shaft* formed of a pithy substance, hollowed at the lower end into a horny tube, containing the blood-vessels by which it is sustained; and the *vane*, a double series of parallel thin plates, one on each side the shaft, set at an angle to it, which are themselves furnished at their edges with a similar though smaller series. In all feathers which are destined to strike the air, these branchlets are hooked into one another, so as to present a continuous surface of astonishing firmness.

The relation which the general clothing-plumage of the body bears to flight,—though less direct and obvious than

inflated with air. As an example of the free intercommunication that exists between the tissues of the body, it may be mentioned that, in this specimen, the great gular pouch, when filled with water (to the amount of seventeen pints), allowed it to escape by dripping from a wound in the *outer joint of the wing*.

that of the quills,—is by no means small. “From the mode in which the feathers, and all their parts, are laid upon the bird, it presents a smooth surface upwards and forwards, so that the animal can move in either of these directions, with very little resistance from the friction of the air. When it moves in either of them, the resistance of friction does not increase so rapidly as the rate of motion; because the pressure smooths the feathers, and causes the air to take less hold on them. This property, which arises in part from the texture of the upper surface of the feathers, but chiefly from the way in which they are formed and placed, is of equal service to birds when they must perch, or otherwise remain at rest, so as to abide the blast, as when they fly exposed to it. Perching or flying, when a bird is in the wind it always faces the current; and thus offers the least resistance both by its form and its feathers.

“When, however, the feathers are taken in the opposite directions, they offer as much increase of resistance as they offer diminution when they are taken above or in front. The wings are always more or less hollow on the under sides, and they take hold of the air by millions of fibres; so that a bird, with its flying feathers on the stretch, would fall much more slowly than one would suppose from the difference between its specific gravity and that of the air.

“The resistance which all the feathers on the body of the bird offer to motion backwards is still greater; and it increases with the force which tends to move the animal in that direction. The instant that it begins to be driven backwards, so that a current against its body is produced, the points of the feathers rise, and take the wind with so many fibres, that the resistance is very similar to that made by a scaly fish, when one attempts to draw one of these by the tail; and every one who has angled, and accidentally caught even a common trout in that way, knows that an

ounce weight is as difficult to land when so hooked as a pound weight is when hooked by the head. But the feathers of birds rise much more in proportion than the free edges of the scales upon any fish; and they are every way as well formed for *holding on* in the air, as those are for holding on in the water. Thus the bird may be said to resist motion backwards in the air, by throwing out the point of each feather like the fluke of an anchor.*

The jaws of a Bird are not furnished with teeth, as are those of a Fish, an Amphibian, a Reptile, or a Mammal, for the purpose of seizing, dividing, or chewing the food. The place of these organs is effectually supplied by a casing of horn, terminating in a point at the tip, and brought to an edge on each side of each jaw. This modification is familiarly known to us as the *beak* or *bill* of the Bird. In the Birds of prey, the beak is a keen carving-knife; the Peregrine Falcon is said to pluck, to disjoint, and to carve its prey with as clean a cut and as prompt a skill as the most accomplished "table-anatomist" could display. In the Woodpeckers, which dig out their food and excavate their dwellings from the solid timber of trees, the beak is an effective chisel. In the Snipe and Woodcock it is a long and slender probe, furnished at the tip with copious nerves of sensation, for feeling in the deep earth of bogs and marshes. In the Parrots it is a climbing hook, a sort of third foot (or rather hand) as well as a fruit-knife. In the Ducks it is a pair of flat spoons, for scooping up the slush of ponds; and in the Gannet it is a strong and sharp fish-spear.

Versatile as is the beak in different tribes of birds, it nowhere performs a proper masticating function; it may divide flesh; it may crack a nut, and, with the assistance of the tongue, shell it; it may separate the grain from the

* Mudie's "Nat. Hist. of Birds," 37.

husk, as we see the Goldfinch and Canary constantly do with their hempseed; but the nearest approach to a chewing action that we at this moment recollect is, the bruising down of hard seeds by means of a knob in the middle of the palate, as in the Buntings (*Emberizadæ*). The consequence of this general absence of masticating power is that the food is swallowed entire. When the food is flesh, the process of digestion is sufficiently simple and rapid to need no preparation; but in the case of the hard grains and seeds that constitute the staple diet of so large a number of species, a peculiar provision is requisite for grinding,—a sort of internal mill.

This organ, well known as the *gizzard*, is endowed with immense power for grinding and crushing; it is almost wholly made up of two semi-globular masses of dense muscle, the two opposing faces of which are coated with a layer of thick leathery skin. Between these the vegetable substances to be ground are dropped from the crop, just as the corn is dropped from the hopper between the mill-stones; and the force exerted when these faces work on each other is immense, and all but irresistible. The facility with which substances the most hard, angular, and even acute, are ground down, and that with perfect impunity to the coats of the gizzard, is proved by the researches of Plater, Réaumur, Redi, and Spallanzani. The experiments of the last-named philosopher possess the highest interest: he introduced tin tubes variously strengthened with wire, into the stomachs of turkeys, and invariably found them crushed, flattened, broken, and variously distorted. Thick balls of glass were broken, ground down, and in a few hours completely pulverised. Pieces of glass, with sharp, jagged edges, shared the same fate, without in the least wounding the callous skin of the gizzard. Needles were cast into a ball of lead, so that their points projected a quarter of an

inch, and being encased in a soft substance, were thrust down the throat of a turkey; in twenty-four hours the points were broken off close or rubbed down, and the gizzard uninjured. "Finally," says Spallanzani, "I fixed twelve small lancets, very sharp both at the points and edges, in a similar ball of lead. They were such as I use for the dissection of small animals. The ball was given to a turkey-cock, and left eighteen hours in the stomach; at the expiration of which time that organ was opened, but nothing appeared except the naked ball, the twelve lancets having been broken to pieces. I discovered three in the large intestines, pointless and mixed with the other contents; the other nine were missing and had probably been voided. The stomach was *as sound and entire* as that which had received the needles.

"Two capons, of which one was subjected to the experiment with the needles, and the other with the lancets, sustained them equally well. My next wish was to know how much time elapsed before the beginning of the fractures; and by repeated experiments on turkeys, I found that these sharp bodies begin to be broken and lose their shape in two hours. This at least happened in two individuals of the species: in one, four of the lancets, and in the other, three of the needles, were broken within that space; the others were blunted, but continued fixed in the balls."*

Turning from these experiments, which, however important in a physiological view, certainly have an appearance of cruelty, let us for a moment glance at Birds in a more inviting aspect, as the songsters of the groves,—the myriad performers in the sweet orchestra, whose notes thrill our ears and hearts, in those spring mornings that are so delightful, when the freshness and loveliness of nature is

* "Dissertations," i. 19.

like the opening of the gate of Eden. Nor less in balmy summer nights, when the Dipper, the Sedge-warbler, and above all, the Nightingale, are awake, and pouring forth rich and solemn melody. "He that at midnight," says Izaak Walton, "when the very labourer sleeps securely, should hear, as I have very often, the clear airs, the sweet descants, the natural rising and falling, the doubling and redoubling of her voice, might well be lifted up above earthe, and say, Lord, what musicke hast thou provided for thy saints in heaven, when thou affordest bad men such musicke upon earthe!"

One might make a volume with extracts from the poets in honour of the Nightingale,—from Homer, who fancies her wailing and mourning her woes, down to Coleridge, who considers it high treason against common sense to suppose there is anything melancholy in nature.

"We have learned

A different lore : we may not thus profane
Nature's sweet voices, always full of love
And joyance ! 'Tis the *merry* nightingale,
That crowds, and hurries, and precipitates
With fast, thick warble his delicious notes,
As he were fearful that an April night
Would be too short for him to utter forth
His love-chaunt, and disburthen his full soul
Of all its music!
. Far and near,
In wood and thicket, over the wide grove,
They answer and provoke each other's songs,
With skirmish and capricious passagings,
And murmurs musical, and swift *jug, jug* ;
And one low, piping sound more sweet than all,
Stirring the air with such an harmony,
That should you close your eyes, you might almost
Forget it was not day."

The Mocking-bird (*Orpheus polyglottus*) of the Western World, rivals the Nightingale in the compass, mellowness,

and brilliant execution of its song, which *it* also delights to trill forth on moonlight nights, making the woods to ring again. We have listened enraptured to the united melody of dozens of these birds together, in the orange-groves of Jamaica, during those beautiful nights when a tropical moon looks down from the vertical sky in dazzling lustre, when the air is cooled by the fresh land-breeze from the mountains, and thousands of fire-flies are sailing in and out at the dark edges of the woods, like living sparks of fire. Then the birds, each taking his stand on the topmost twig of an orange or lime-tree, pour forth, one after another, their gushing songs, now one answering his fellow, now all singing together as if eager to drown each other's voice; now one alone is heard for a few moments, then the others rush anew into the contest, which is often maintained till after midnight.

The song of Birds is closely connected with the reproduction of the race. There are a few species, it is true, as the Redbreast, that protract their melody into autumn, and even into winter; but the grand chorus of the woods and fields comes in and goes out with spring. It is the male, almost exclusively, that is the performer; he begins to sing his love-song as he woos his mate, while the hedges are yet leafless; he sings blithely in the intervals of his labour, as he assists to build the nest; and he sings almost without intermission from morning to night, to cheer his spouse in her patient duty of incubation. As soon as the parental duties cease, we hear little more of "the voice of the bird."

And thus we are introduced to that miracle of instinct, the Bird's nest; which must, however, be the special subject of another paper.

P. H. G.

TERRESTRIAL MAGNETISM.

WHEN we become familiar with any phenomenon we are disposed to neglect all consideration of the causes by which it is brought about or continued. The mariner's compass is a thing of ancient date ; it was the indicator to the early navigator of the Indian Seas, the guide to Columbus across the wide Atlantic, in his perilous voyage from the Old to the New World, and it is the aid by which every modern seaman steers his course to the most distant shores.

We look at the compass-needle pointing ever towards the mysterious north, yet how few are those who ask themselves, why that bar of steel has this singular constancy of direction ? The answer, too, which is usually given, when the question is asked, is to the effect that there is at the poles of the earth some peculiar *attractive* power which *draws* the needle towards it. When the simple experiment of attracting iron-filings by a magnetised bar of steel—a magnet—is made, this theory—of soliciting north and south poles—appears to be confirmed. Yet there is no evidence of the existence of any magnetic masses near the axis of our planet, and the remarkable fact that the spot towards which the compass-needle points is constantly varying, shows that this attraction cannot be due to this cause.

Let us examine briefly the phenomena of terrestrial magnetism, as indicated by a small magnetised bar of steel, so suspended that it is free to move in *any direction*.

It is necessary that we suppose ourselves at the equator. There, and nowhere else upon the surface of the earth, will our needle maintain a perfectly horizontal position. If we now advance, towards either pole, we shall find that

the magnetised bar declines at that end which points to the pole towards which we are approaching. We will imagine that we are passing northward, and observing this phenomenon, which was first noticed by Columbus. It will be found that the *dip of the needle* steadily increases until in the latitude of Paris the *inclination* is $69^{\circ} 12'$, and at London $69^{\circ} 57'$; and in the highest northern latitude which has been reached it is $89^{\circ} 59'$, or nearly vertical. The *dip* at any particular place is subject to regular variations within small limits, showing some regular movement in the force, which we call Magnetism.

Again, the point to which the north-pole (so called) of a compass-needle is directed, is not the true pole of the earth, but the magnetic pole, a point which is now situated about 25° west of the true north. This point is also subject to constant change. From the year 1657 to 1662 the magnetic pole and the polar axis of the earth coincided; and we learn that in 1580 it was $11^{\circ} 17'$ eastward of the true pole. Since that time the magnetic pole was steadily moving westerly, until it arrived at its maximum variation in 1815, and it is now as steadily returning again. These movements of the force prove that the phenomena of the compass-needle are not due to any fixed centre of magnetic attraction.* The question naturally arises, To what, then, is this magnetic attraction due? Fortunately, the advance of knowledge enables us to give an answer, which indicates many of the conditions to which terrestrial magnetism is due, and opens out to us a new train of inquiry which is of the most wonder-awaking character.

Oersted, of Copenhagen, was the first who observed that a magnetised bar, being suspended over, and *in the same direction* as a stretched copper-wire, moved in a

* The term *attraction*, so commonly used, is here employed to express the *pointing* of the needle without intending to imply any drawing power.

remarkable manner, when an electric current was made to pass through the wire. Whenever the wire, by contact with the voltaic battery, was brought into an electrical condition, the magnetic-needle moved, and eventually came to rest, at right-angles to the wire. Thus was established the law that magnetic force is always exerted at right-angles to electrical force. If around a bar of soft iron, possessing no magnetic character, some copper-wire is coiled, and this wire is connected with a voltaic battery, the bar—so long as the electrical current circulates through the wire—becomes a powerful magnet, capable of exerting very strongly the polar forces of *attraction* and *repulsion*. To render the law clear, let us describe another experiment: A large bar of steel, rendered magnetic, is placed upon a table, and a copper-wire is suspended above it, so that it hangs in the direction of its length, and by some simple arrangement, which does not interfere with its freedom of motion, we have the power of making an electric current circulate through the wire. Now, as the magnet is fixed, and the wire free, the latter moves and arranges itself at right-angles to the former. *Electrical force and magnetic force are exerted at right angles to each other.* The application of this law to the grand phenomena of terrestrial magnetism must be shown.

Every traveller by railway is now familiar with the lines of wire which run along by the sides of the iron roads. The express trains rush onward with a bird-like speed, but the intelligence of their flight is communicated from station to station in less time than the driving-wheel of the engine can make one revolution. Lines of such wires now pass from London to St. Petersburg; and the governments of these two powers, which were waging deadly war, are now exchanging messages of peace, and the electricity which carries the thought expressed in London

tells it in St. Petersburg in *one second of time* from its departure.

Those wires, running east and west over the earth's surface, have brought us acquainted with a fact, suspected before, but which remained until recently only an ingenious and probable theory.

It should be explained that many of those wires are, for special purposes, connected with the earth, by sinking into the soil what is called an *earth-plate*. If any electrical disturbance takes place in the earth it is communicated along the wire, and indicates itself by disturbing the telegraphic needle at a distant station.

Zantedeschi and Barlow, by carefully observing the phenomena, have proved that as the earth, in its diurnal rotation, advances to meet the sun, there is generated from each point upon which the sun's rays fall, a current of electricity, which circulates towards the west. These electrical currents thus excited by solar power—probably by solar heat—are constantly circulating around the earth, from the east towards the west. They may be imitated, by placing copper-wires upon an ordinary globe along the lines of latitude. If we hang up a compass-needle above our experimental-globe it will swing at right-angles to these wires, or in a direction corresponding with the lines of longitude. So above the natural globe the magnetic bar is compelled to point north and south, in obedience to the law which has been indicated.

The solar rays falling on the earth's surface in the morning awaken a dormant power, which sends its delicate pulsations westward from that locality. The myth of the harp of Memnon, bursting into sound at the touch of the morning rays, would appear to be the outshadowing of a great philosophic truth. Undulations of a mysterious kind—ELECTRICITY—are generated by solar agency, and cir-

culating according to the law fixed by the Almighty Creator of all things, they develop a modified form of this force in a contrary direction—MAGNETISM—which is so all-important to the ocean-voyager.

The researches which have been made by order of all the great governments of Europe within the last few years have brought us acquainted with some other truths, showing us that “this low earth of ours” is ever, for its ordinary phenomena, dependent upon the exertions of force taking place at millions of miles from us.

Spots on the sun may almost always be observed by looking at that orb through a smoked glass. Galileo was the first who made any especial observations on them. Scheiner and Mayer examined them carefully. Dr. Wilson promulgated, in 1774, a theory of their formation. Sir William Herschel observed those spots in their progress of creation and decay; and Bode and others have framed ingenious hypotheses to explain these remarkable phenomena. We may probably, on some future occasion, devote a paper to the physical condition of the sun’s surface. These spots, which are now proved to be enormous openings, produced by a vorticose action in the gaseous envelope which surrounds the body of the sun, (spots having a diameter of 31,000 miles, and 45,000 miles have been observed) are known to observe a regular order in their formation. They advance from their minimum number to their maximum in about five years, and decline again to their minimum in five years; thus moving in uniform cycles of ten years.

Of the cause producing these remarkable phenomena we are profoundly ignorant; with the law which regulates their position on the sun’s disk—although their place is curiously well defined—we have not the slightest acquaintance. We only know, that in some years as many as three hundred spots have been examined, and that year by year

they decline, until not more than thirty-three or thirty-four make their appearance during one annual revolution of this planet around the sun. Beyond this, however, we do know, that *the earth's magnetic intensity varies in exact obedience to the changes which take place in the number of solar spots.*

Again, it has been discovered that when our magnetic needles exhibit, as they sometimes do, a singular disturbance, which is called a "*magnetic-storm,*" indicated by increased and continued vibrations, a large solar spot is in process of formation. A small magnetised bar of steel upon this earth sensibly feels some power in action on the far distant sun. Great phenomena, probably similar to the revolving storms of the tropical regions, occurring upon the centre of our planetary system, appear to be the cause—certainly the disturber—of that singular and important power, which we call TERRESTRIAL MAGNETISM.

R. H.

THE MIRACLE ROD OF THE PROPHET.

"GIRD up thy loins," spake Elisha to his servant, Gehazi, as the Shunammite had entreated him concerning the quickening of her son, "and take my staff in thy hand. If any one meet thee, salute him not; and if any one salute thee, answer him not again, and lay my staff on the face of the child, that his soul may return to him again."

Joyfully did Gehazi speed away with the wonder-working rod of the prophet, after which he had aspired so long, for, for a great while it had been his chief desire to do a miracle. "Whither hastest thou so fast, Gehazi?" called Jehu, the son of Nimshi, to him. "To raise a dead one," answered Gehazi: "for here is the prophet's staff."

Full of curiosity, the crowd assembled and ran behind him: from every village and town, through which he came,

the people hastened after—to see the raising of the dead. And with hasty steps Gehazi went before them, and when they came to Shunem, he stepped forward and laid the staff on the face of the boy. But there was neither voice nor hearing.

Then he turned the staff about and laid it otherwise, to the right, to the left, upward, downward: but the boy arose not, and Gehazi was mocked of the multitude. Confounded, he turned him back to the prophet, told him what had befallen, and said, “The child is not raised!”

Then Elisha took the staff and hastened to Shunem, and went into the house, and shut to the door before them all, and prayed to the Lord, and went up and laid himself upon the child, and put his mouth upon the child’s mouth, his eyes upon his eyes, his hands upon his hands, and lay upon him till the body of the child grew warm. But wherewith did he warm the body of the child? With his still, humble prayer, with the breath of his unselfish, disinterested love.

“Take up thy son,” he said to the happy mother; and the vain Gehazi stood ashamed.

From the German of Krummächer.

REVIEW OF THE MONTH.

WITH the merely prohibitory or restrictive aspect of the Sabbath question, we have less sympathy than with efforts to endear the day and improve it for its noble purposes. Doubtless, “thou shalt *not*” occurs in the commandment; but it is most in accordance with the spirit of the Gospel to set forth the positive blessedness of the actual observance. And we earnestly hope, that enlightened and large-minded men may be led to grapple with this problem, so as to indicate methods by which the Sabbath and the sanctuary

may be rendered attractive to those who now waste and profane the one and forsake the other.

Meanwhile, it is very cheering to observe the great increase in England of open-air preaching. In Birmingham, Bristol, and Liverpool, as well as London, much good has thus been done; and in Cambridge it is gratifying to know that several under-graduates have held such services in the streets of that town, attended by numbers of the "common people." The students wear their academic costume, and the University authorities do not interfere.

Originating, we believe, with one who has spent and laboured much in the cause of Sabbath observance, John Henderson, Esq., of Park, the Edinburgh Tract Society is publishing a series of papers on the subject, entitled, "Tracts for Working Men and their Fire-sides." Including contributions from Canons Stowell and Miller, Professor Miller, the Rev. Dr. Guthrie, J. A. James, W. Arthur, &c., it promises to be a first-rate series. And we have been not a little delighted with a packet of single leaves, "The Sabbath: Is from God—Is not Jewish—Is made for Man—Is a day of gladness and not of gloom," &c., by the Rev. T. Alexander,—terse, pithy, and warm-hearted, and, with their tinted paper, for purposes of distribution very taking.

John Foster's ideal of ministerial independence was, to be owner of his own place of worship and pay his own salary. On some such autocratic principle, our friend, the Rev. J. B. Dickson, has started his serial, "The Temple-Lamp," of which he himself is at once editor and sole contributor. After all, the Miscellany is more varied than some which boast an ample staff of authorship; and, in the numbers already published there are articles of a very high order in theology, practical Christianity, and mental philosophy, besides stories and poems. Mr. Dickson is a man of genius, and his compositions glow with enlightened and ardent piety.

We have been much pleased with two little volumes published by the Sunday School Union, — Lectures to Children “On the Bible,” and on “Scripture Doctrines,” by Mr. Green. They avoid the common errors of childishness and irreverent familiarity; but they are affectionate, interesting, and impressive.

Amongst the last items we gather from that comprehensive and excellently-conducted periodical, “The News of the Churches,” and its contemporary, “Evangelical Christendom,” we are happy to observe that a deep awakening is spreading through the Lutheran churches of Sweden and Norway, the former especially; and that the prospects for religious toleration in Prussia begin to look brighter. Since the French seizure of Tahiti and the introduction of Romanism, there has been a sad moral depravation as well as spiritual decay in that once flourishing mission-station; but in other isles of the Polynesian group the progress is great, and among the Feejee islanders cannibalism is all but abolished, and the way is everywhere open to missionaries. There is danger, however, lest through the machinations of a Romish priest the French may be led to seize upon Tonga, and repeat on that interesting island the wrongs they have inflicted on Tahiti. In their present obscurity the romantic aborigines of America are too seldom remembered; but they have not been forgotten by the American churches, and it is not a little cheering to find how great has been their success, more especially among the Choctaws and Cherokees. In the former nation there are 1494 communicants, and their churches during last year contributed 1279 dollars to benevolent objects. The great mass of the Cherokee nation can read, and there has sprung up among them a strong desire for books, which are in process of being supplied by colporteurs.



Death-Prison at Ava.

PIONEERS AND FIRST-FRUITS.

JUDSON IN BURMAH.

ADONIRAM JUDSON was born in Massachusetts, America, August 9, 1788. His father, who was a minister, was a vigorous-minded man, but too anxious that his children should be distinguished and clever. And no doubt his eldest son was clever. When hardly able to write, he saw an enigma in a newspaper, with a challenge to any one who could solve it. Adoniram wrote out the answer, addressed it to the editor, and put it in the post-office. Suspecting that it was some mischievous prank of the minister's son, the postmaster took the letter to his father. The old man was so much struck with the solution that next morning he said, "Here is a book of riddles I have bought for you. It is a very common one; but as soon as you have solved all that it contains you shall have more difficult books." And then patting him on the head with more than usual affection, the old man added, "You are a very acute boy, Adoniram, and I expect you to become a great man." The book of riddles turned out to be a book of arithmetic, and although a little disappointed at first, the young student set to work with such ardour that he soon gained a reputation for his attainments in the science of numbers. Such was the fame of the little prodigy, that before he was ten years of age a gentleman sent him a problem, with the offer of a dollar if he could find out a solution. For a whole day he shut himself up in his chamber, and pondered it without success. Next day his little brother was taken ill, and he was sent for to amuse the invalid. Whilst slowly piling up a cob-castle, "That's it! I've got it!" he exclaimed, as he sent the materials

rolling over the floor, and ran off to his own room to write out the calculation. The dollar was won, and his fame was established.

John Foster was right when to a friend, congratulating him on the birth of a son, he said, "If the fellow turns out *good*, I shall not so much mind about his being extra clever. It is goodness that the world is wretched for wanting, and if all were good none would need to be able." The elder Judson had nearly destroyed his first-born in his excessive desire to see him distinguished. The boy grew conceited, unamiable, and absurdly ambitious. He had taken "fire into his bosom," and he was "burned." There was nothing in the way of earthly eminence, however extravagant, to which he did not inwardly aspire; and before he was fifteen his day-dreams represented himself as the most illustrious poet or statesman of the future America. But then the damping thought crept in,—Suppose he reached the pinnacle, could he retain it for ever? The sages and heroes, whose renown made him almost mad with hopeless rivalry, had long since gone down to the dust, and a hundred years hereafter what comfort would it be though the world were ringing with his fame, and he himself not here to enjoy the glory?

He was sent to college. It was early in this century when a flood of free-thinking swept over America. In the class above Judson was a young man of the name of E——, brilliant, witty, and popular, but a determined Deist. Between him and the minister's son there sprang up a close intimacy, which ended in the latter becoming, in his own opinion at least, as great a sceptic as his friend. He told his parents that he had ceased to believe in Christianity. His father's stern reproofs and arguments were hailstones on adamant; but his mother's tears penetrated his conscience like drops of fire, and could not be forgotten. He was twenty years of age. He had joined a company of players.

at New York, and now, in order to see the world, he set out on a solitary tour. One night he stopped at a country inn. Lighting him to his room, the landlord mentioned that he had been obliged to place him next door to a young man who was exceedingly ill, in all probability dying, but he hoped that it would occasion him no uneasiness. Judson assured him that, beyond pity for the poor sick man, he should have no feeling whatever. Still the night proved a restless one. Sounds came from the sick chamber—sometimes the movements of the watchers, sometimes the groans of the sufferer—and the young traveller could not sleep. Just through that wall, he thought, there is an immortal spirit about to pass into eternity, and is he prepared? And then he thought, “For shame of my shallow philosophy! What would E——, so intellectual and clear-headed, think of this boyish weakness?” And then he tried to sleep; but still the picture of the dying man rose up to his imagination. He was “a young man,” and the young student felt compelled to place himself on his neighbour’s dying bed, and he could not help fancying what, in such circumstances, would be his thoughts. But the morning dawned, and in the pleasant daylight his “superstitious illusions” fled away. When he came down-stairs he inquired of the landlord how his fellow-lodger had passed the night. “He is dead,” was the answer. “Dead!” “Yes; he is gone, poor fellow! The doctor said he would probably not survive the night.” “Do you know who he was?” “Oh, yes; it was a young man from Providence College—a very fine fellow; his name was E——.” Judson was completely stunned. Hours passed before he could quit the house; but when he did resume his journey, the words “Dead! lost! lost!” were continually ringing in his ears. He now knew the religion of the Bible to be true; his godless spirit was in despair; and as he turned his horse’s head towards Plymouth, he rode

back to his father's house a crushed and crest-fallen penitent.

The belief of the Gospel, to which he at last attained, gave him peace with God. His projects of literary and political ambition had passed away like guilty dreams, and he asked no other question than the one which ought to be supreme with every monument of mercy, "Lord, what wouldst Thou have me to do?" He pursued his studies for the Christian ministry, and the perusal of Buchanan's "Star in the East" turned his thoughts to the heathen. In 1810 a Board of Commissioners for Foreign Missions was formed by the Associated Churches of Massachusetts, and this Board undertook to send Mr. Judson, Mr. Newell, and some others, to India. The spirit in which he went will be best understood from the following letter to the lady who was to share his toils and dangers, written on the first day of 1811:—

"It is with the utmost sincerity, and with my whole heart, that I wish you, my love, a happy new year. May it be a year in which your walk will be close with God; your frame calm and serene; and the road that leads you to the Lamb marked with purer light. May it be a year in which you will have more largely the spirit of Christ, be raised above sublunary things, and be willing to be disposed of in this world just as God shall please. If our lives are preserved and our attempt prospered, we shall next new year's day be in India, and perhaps wish each other a happy new year in the uncouth dialect of Hindostan or Burmah. We shall no more see our kind friends around us, or enjoy the conveniences of civilised life, or go to the house of God with those that keep holy day; but swarthy countenances will everywhere meet our eye, the jargon of an unknown tongue will assail our ears, and we shall witness the assembling of the heathen to worship idol gods. We shall be weary of the world, and wish for 'wings like a dove, that we may fly away and be at rest.' We shall probably experience seasons when we shall be 'exceedingly sorrowful, even unto death.' We shall see many dreary, disconsolate hours, and feel a sinking of spirits, anguish of mind, of which now we can form little conception. Oh, we shall wish to lie down and die."

On the voyage to India Mr. Judson was led to change his views as to the lawfulness of infant-baptism; and, consequently, had to resign his appointment as agent of the Society which sent him out, and soon after his arrival in Calcutta he was peremptorily ordered out of the country by the agents of the East India Company. But both these incidents, which occasioned much temporary distress and difficulty, were overruled for great good. His change of opinion on the subject of baptism led to the formation of what is now known as the "American Baptist Missionary Union;" his banishment from India laid the foundation of the Burmese Mission.

Burmah is the extensive country lying betwixt India and China. With its mountains rich in gold, rubies, and silver; with its wells of petroleum and its beds of amber; with its forests of teak and catechu, and trees of some sort or other yielding fruit every month; with its boundless capabilities of culture, and with rivers, like the noble Irrawadi, to convey its treasures to and fro, Burmah is one of the most favoured regions which bask beneath the tropic noon. But "man is vile." Its government is the most absolute form of despotism. The whole inhabitants are one vast family of slaves, of whom the king is the owner. Life and limb, person and property, are at his unquestioned disposal; and whilst the highest in the land throw themselves in abject prostration before the "golden foot," entreating for a glance from the "golden eye," or a favourable word from the "golden tongue," the palace itself is an object of virtual worship, and when they draw near it passengers dismount and take off their shoes. The religion is Buddhism, with its curious tenet of the transmigration of souls. But although the five precepts of Buddhism are, Thou shalt not take life: nor steal: nor commit adultery: nor lie: nor drink intoxicating liquors,—so powerless over the heart

and conscience is this system that no people of the East are more rapacious and cruel. They are "a nation of liars," and one who knows them well has declared, that although "under pain of many years' suffering in hell Buddhism forbids theft and falsehood, there is not a single Burman in the country, who, if he had a good opportunity, without danger of detection, would hesitate to do either." And not only is life very cheap, but death is usually inflicted with every refinement of torture.

Standing half-way betwixt India and China, the Burmese race combines the qualities of the Hindoo and the Chinese; although more closely resembling the latter. With olive complexions, and straight coarse black hair, and a figure rather short, but firm and vigorous, they are capable of more exertion than the soft and effeminate Bengalee; but they have neither the ingenuity nor the industry of their Chinese neighbours. Many of the men are able to read, but the comforts of life are few; and with all the vast capabilities of the soil, most of it is impervious jungle, the haunt of the tiger, the leopard, and wild elephant, or mountain forest, the unvisited domain of the ape, the antelope, the parrot, and the cobra-de-capello.

It was in the year 1813, that Mr. Judson took up his abode at Rangoon. One or two feeble efforts had already been made to introduce the Gospel; but at the time of Mr. Judson's arrival, there did not exist a single Burmese Christian. Nor was it for six years that he and the associates, who afterwards joined them, saw any case of inquiry so satisfactory that they could venture to confer the ordinance of Christian baptism. After this, however, the work went steadily on. The Missionaries preached in a spacious apartment, prepared for the purpose; the New Testament was translated into Burmese; the children were taught; tracts were circulated; and in 1824 not only did

the native Church number eighteen exemplary members, but the influence of Christianity was becoming perceptible in the improving population around.

In this year, however, a storm burst over the Mission. Hoping to establish a branch-station in the capital, Mr. and Mrs. Judson had gone up to Ava. But before their arrival hostilities had commenced betwixt the Burmese and the British. A suspicion, not altogether unnatural, seized the government that the white strangers were spies of the English; and one day as they were preparing for dinner an officer entered, with a black book in his hand, and attended by a dozen Burmans, one of whom from his spotted face they knew to be the executioner. This ruffian instantly seized Mr. Judson, and bound him so tight with cords that he was nearly strangled, and hurried him off to the death-prison, whilst Mrs. Judson was left arrested and in the charge of Burman soldiery. A dreadful place was that death-prison. The gaolers were all branded felons—some blinded of an eye, others mutilated of their nose or ears, or with a mark burnt into their cheek; and, being the vilest of the vile, they found a fiendish pleasure in tormenting their victims. Built on the ground and with a poisonous miasma rising from the damp earth, the prison itself was so unwholesome that, betwixt disease and hardship, its inmates were constantly dying; and yet, replenished with captured outlaws and murderers, English soldiers and sepoy, courtiers in disgrace and rich merchants, whose wealth the sovereign coveted, this chamber of horrors was constantly full. And as there Mr. Judson and his companions lay, with three sets of fetters fastened round their ankles, and day after day passed on, and week after week, witnessing the horrible tortures with which one victim after another was despatched, and wondering when their own turn was coming; outside Mrs. Judson was using every effort to procure

their deliverance, or, at least, a mitigation of their sufferings. She interceded with the sister of the king, she bribed the officials, she brought food to the prisoners; and as with the intrepidity of a martyr and the zeal of an angel she passed through the streets of Ava on her mournful labour of love, she became an object of sympathising admiration, and was surrounded with a halo even in the eyes of the brutal Burmese.

Amidst all his anxiety for his heroic partner and for their only child, who was born soon after the desolation of their home, there was another object which occasioned Mr. Judson much solicitude. This was his translation of the New Testament. A part of it was printed, but should the remaining manuscript be lost and his own career now terminate, it would be many years before any other missionary could reproduce the book he had prepared for Burmah. To relieve his mind Mrs. Judson stitched up the manuscript in a little pillow on which he might rest his head, as he lay with his fettered ankles on the prison-floor. The pillow looked so mean and felt so hard that the gaolers did not covet it, and as long as it was there the author hoped that should he himself rest from his labours his work would survive him.

After seven months of captivity, one day a band of men rushed into the prison-yard, and seizing the white prisoners, added two pairs of fetters to the three they already wore, and then dragged them into an inner dungeon. It was the commencement of the hot season, and as a hundred wretched beings writhed and gasped on the floor of this dark and air-less den, they grew almost frantic with pain and suffocation. But night arrived, and a whisper ran round that at three in the morning the foreigners should be led out to die. At the news some bold men grew weak, and at first the missionary felt a pang that he must go

at last without saying farewell to his unsuspecting wife and child. But "gradually the feeling changed, and he would not have had it different. She had left him in comparative comfort that day; she would come the next and find him beyond her care. It would be a terrible shock at first; but she would be spared much anxious suffering, and he could almost fancy that she would soon learn to rejoice that he was safe in glory. He felt thankful, too, that the execution was to take place in the night. He should pass his own door on the way. There he might breathe his silent farewell, while she was spared the parting agony. He thought of Burmah, too, even then. The English would most likely be conquerors; and then there would be nothing to hinder the propagation of Christianity. He even recollected—so calm and dispassionate were his thoughts—some passages in his translation capable of a better rendering; and then he speculated on the pillow he had lost that day, weighing the probabilities of its ever falling into his wife's hands, so that the manuscript would be recovered. At length the fatal hour drew nigh. They had no means of ascertaining it precisely, but they knew that it could not be very far distant. They waited with increased solemnity, then they prayed together, Mr. Judson's voice for all of them; and then he, and probably each of the others, prayed separately. And still they waited, in awful expectancy. The hour passed by, they felt it must be passed, and there was no unusual movement in the prison. Still they expected and waited, till finally there woke a glimmering of hope, a possibility that they had been deceived. And so, hoping, and doubting, and fearing, they lingered on, till the opening of the door assured them of what they had long suspected. It was morning, and for this time at least the alarm had been false."

Just at this time a singular accession was made to the inmates of the prison. The king had received the present of a lion from some foreigner, and now some superstitious people tried to persuade the king that the lion was in league with the British, who bore a lion for their ensign, and so the noble animal was doomed to the death-prison. A strong cage was provided in the yard, "and now commenced a new and fearful scene of misery. The unhappy prisoners had seen men starved, and beaten, and smothered, and strangled to death; but there was something almost supernatural in this new horror—a gradually-starving lion! Day after day, the noble beast writhed in the pangs of hunger, parched with thirst, and bruised and bleeding with his fearful struggles, while his roarings seemed to shake the prison to its foundations, and sent a thrill of indescribable terror to the hearts of the occupants. Sometimes a compassionate woman would steal to the cage after dark, and thrust a morsel of food between the bars; but it was necessarily a trifle to the powerful beast, and served only to increase his ravings. At other times one of the keepers would throw pails of water over him, which would be greeted with almost human shrieks of pleasure, though it only served to lengthen for a little the terrible term of suffering. At last the scene was over. The skeleton of the poor beast was dragged from its cage and buried;" and Mr. Judson, who in the inner prison had been seized with fever, succeeded in getting himself transferred to the lion's empty den. In its ample space and better air, he gradually began to recover.

The miseries of one-and-twenty months we have no heart to detail: but few things in the history of modern barbarism are more harrowing than the insults and tortures heaped on those hapless captives, and few things in the history of modern devotion are more affecting than the

faith and magnanimity with which these hardships were sustained. Surrounded with mercenary wretches and murderous ruffians, amidst pain and contumely and in the daily shadow of death, the benevolent purpose which had brought these disciples of the Saviour to Ava never faltered; their heaven-kindled consecration to the Burmese people never changed to bitterness; and in the spirit of their Divine Master their prayer for their cruel oppressors was still, "Father, forgive them, for they know not what they do." Mrs. Judson came daily to the prison, where her efforts to mitigate their miseries rendered her a guardian angel in the eyes of the inmates; and, leaving her infant to be taken care of by its father, she would hie away in quest of provisions, or to plead for some indulgence with a sordid and stony-hearted underling, and then return to carry home the child, and bid an adieu which might be followed by no good-morrow.

At last the Burmans were fain to sue for peace, which they purchased by the surrender of large territories. The missionaries and other foreign prisoners regained their freedom. To his unspeakable delight Mr. Judson found the manuscript Testament safe in his own house, to which a faithful attendant had carried it from the death-prison, where he found it thrown aside as rubbish, on that dismal day when its owner was locked up in the inner dungeon. And, what was equal cause of rejoicing, the native Christians had continued steadfast, and some had made such progress in Scriptural knowledge and piety, that soon afterwards the missionaries ordained them as pastors to labour among their countrymen.

A few months after this great deliverance, Mr. Judson lost his high-hearted and saintly partner, and soon afterwards their little Maria was laid in her mother's grave.

But the work went on. The annexation of so much of

the country to the British empire was itself a prodigious advantage. In those regions life became sacred, and property secure; justice was impartially administered, and the profession of Christianity was attended with no sort of danger. The missions at Arracan and Maulmain received a remarkable impetus; and more especially amongst the Karens—an oppressed and scattered people, who occupy among the Burmans a place similar to that of the Anglo-Saxons under their Norman conquerors—the progress of the gospel has been as rapid as its results are cheering. And now the Missionary Union has in Burmah 29 missionaries, and 129 native assistants, with 1062 scholars, and upwards of 7000 converts. This great salvation the father of the mission was allowed to witness before he in peace departed. He died at sea, April 3, 1850.

As combining eventful incidents with high personal attainments and ministerial success, perhaps no biography altogether equals that of Dr. Judson since the days of that other eminent missionary the Apostle Paul. Of his adventures and his usefulness we have already spoken: we may now notice a few of his personal characteristics.

He was blessed with a clear understanding and a sound judgment. Some subjects he had to examine anxiously, but after his mind was made up nothing could shake his conclusion. As long as men are believing for other people it is like supplying goods by contract; they take it for granted, and have no fears but that all is sound and solid. But when the said contractor begins to build a house for himself, and when a flawed pillar or a single rotten girder might be the death of himself and his children, ordinary conscientiousness is quickened into unusual carefulness; every brick and beam is tested. Dr. Judson was no mere theologian; he was a man of faith. He was building for eternity, and not only was he careful to keep on the right

foundation, but he was anxious to select trustworthy materials. On every stick and stone of the structure might have been stamped the word "warranted."

And the conclusions of his clear understanding, with his eminently practical turn, became elements in his daily existence. "His simple and confiding faith seemed to place him in direct communication with God. It never appeared to him possible for a moment that God could fail to do precisely as He had said. He believed that Burmah was to be converted to Christ, just as much as he believed that Burmah existed. He believed that he had been sent there to preach the Gospel, and he as much believed that the Holy Ghost would make his labours in some way, or at some time, the means of the salvation of the nation, as he believed that there was a Holy Ghost. During his visit to Boston a venerable friend asked him, 'Do you think the prospects bright for the speedy conversion of the heathen?' 'As bright as the promises of God,' was the prompt reply. The same unshaken confidence in God was manifested in all affairs; in prayer he asked not as a duty, nor even as a pleasure, but he asked that he might receive."

His adamant strength of will; his perseverance; his apostolic love to the heathen; his astonishing mastery of the language, in which he preached with more fluency and power than in English, were all elements in his success. But the greatest element of all was his holy consecration. After his deliverance from prison, and the death of his wife and child, he began to look on this world as merely a scene for the discharge of duty. The only world which had any charms for him was that one into which were gathered all whom he most dearly loved, both created and uncreated. That world was constantly present to his mind, and as he thought on its beloved and sinless occupants, he longed to be like them. He sought to mortify in himself

every sinful habit and sense-ward tendency, and panted after that Christian perfection which loves man heartily and God supremely. Finding that missions were languishing for want of funds, he threw into their treasury his patrimonial estate. Finding that his nicety and love of neatness interfered with his labours among the filthy Karens, he devoted himself to nurse the sick labouring under the most loathsome diseases. Finding that his youthful love of fame was not utterly extinguished, he threw into the fire his correspondence, including a letter of thanks he had received from the Governor-General of India, and every document which might contribute to his posthumous renown. And finding that his soul still clave to the earth, for a period of several weeks he quitted all his friends, and, subsisting on a little rice in a bamboo-hut on the edge of the jungle, for several weeks gave himself entirely to communion with God.* And although some may think that in all this he strove to "wind himself too high," it must not be forgotten that a low stature, or a languid faith, will never raise a besotted people, and he would need to have a firm hold on heaven who tries to lift a nation from the miry pit of heathenism. We know not if it is usual for Christianised nations, as well as individual converts, to repeat the lineaments of a spiritual father; but if it be so, we may hope that coming years will see many noble examples of self-renunciation and devotedness to God, of holy heroism and living for eternity, among the believers of Burmah.

H.

* Memoirs (English Edit.), vol. i. 434. From the pen of that "master in Israel," Dr. Wayland, this is one of the most edifying and arousing contributions which the present century has made to our store of Christian biography.

THE CHILD AND THE SWANS :

AN EMBLEM.*

MARK yonder little child at play,
Rejoicing in the sunny day ;
 How innocent her glee !
See ! now she is a horse again,
And prances with her tiny wain
 Along the shady quay.

More slowly now she wends along
And mocks the sparrow's homely song ;
 Now stops and looks sedate.—
Oh, say what infant trouble lies
Beneath those sorrow-speaking eyes ;
 Why droops her little pate ?

It is because among the trees,
The little birds in twos and threes
 Have all together flown ;
And there they stretch their merry throats,
And warble back each other's notes
 While she is all alone.

* See p. 9. Although our correspondent is evidently unacquainted with the stanzas of Adrian Spinniker, in whose "Zinnebeelden" the subject is expounded at length, his version of the device is scarcely less spirited and successful than the original.

She hastens to the river-side
Where, drifting slowly with the tide,
 A boat drops on its way ;
But while she hears the sailors sing,
They hoist the vessel's great white wing
 And leave her in dismay.

But oh ! what joys await her there ;
For on that river broad and fair
 There swims a noble swan :
With haughty neck and snowy pride,
She calls her cygnets to her side,
 And gracefully glides on.

The child forgets her waggon toy,
She clasps her hands, she shouts for joy,
 And bids them come and play.
They move towards her through the stream,
While myriad sparkling ripples gleam
 Along their silvery way.

They gather round the little maid,
She stoops to meet them nought afraid,
 And hopes their games to share ;
But now fresh trouble fills her heart,
They will not come to draw her cart,
 She may not join them there.

She lingers o'er the river's brink
And wonders whether she would sink
 If she were with the swan ;
She understands no "reason why,"
So drops her ball as if to try—
 But now where has it gone ?

She scarcely saw it float, before
 The swan has darted from the shore
 And carried it away.
 Ah! see, she thinks to leave the land,—
 But Heaven bless that mother's hand
 That forces her to stay!

COMPARISON.

This child's an emblem of the soul
 That's left in youth without control,
 When all things seem but toys;
 It wanders through the maze of life,
 Then, wearied with the lonely strife,
 It sighs for other joys.

The Syren "Pleasure" waiting near
 Wafts mystic music to the ear,
 And bids it join her train;
 Then Conscience wakes her stern alarms,
 For none who "sink" within her arms
 Return to life again.

But Folly, spurning all reproof,
 Shuns Wisdom's path and stands aloof,
 Still ling'ring to depart;
 Till Heaven's merciful command
 Bids Sorrow snatch with sparing hand
 The suicidal heart.

T. S.

THE DULL WATERING-PLACE.

(Concluded.)

ELEANOR was so absorbed in reflecting on her aunt's remarks, that she did not notice the question which concluded them. So, after a few seconds, Mrs. Mortimer spoke again,—

“ Well, Eleanor, what comes next ? ”

“ I don't know, aunt. You talked of fishwives and fishermen on the beach, and mending of nets, and all sorts of things.”

“ Never mind about the mending of the nets ; though I think I see those boys and women with their shuttles darting, still. But they and the tall tarred houses all go into your portfolio, Eleanor. Those beautiful studies, you know, which you can hardly get done in the first month of our stay!—Ah! it has just come into my head! I thought there was something else before we left the beach.”

“ What is it, aunt ? ”

“ Natural history, my dear. Some particular branches of it however,—Shells, Seaweeds, and Zoophytes.”

Eleanor's countenance fell.

“ I don't know much about those things, aunt—only about shells. They are really beautiful.”

“ So are seaweeds and zoophytes, Eleanor ; as, indeed, is everything which God created and made, the small as well as the great. Indeed, for one reason the small *more* remarkably so than the great, because it fills the mind with a kind of wondering awe to learn that things and beings invisible to any human eyes are formed and created with the same

exquisite beauty and contrivance as those larger ones which seem more particularly adapted to adorn man's world—the world revealed to his senses. Then, too, how interesting to compare the universal perfection of God's works with the universal imperfection of those of man! *We* create and make solely for ourselves—*our* range of eyesight is our measure, and we take the natural range of our senses as the guide of what is perfect and good. But look at the result! Alter the range of your sense of sight by the power of the microscope, and the finest-pointed needle that can be made becomes to all appearance an untidily-formed iron pole, with a miserably rough attempt at a polished end. Whereas the hairs on a fly's leg, or the sting of a wasp, or the feelers of an animalcule, invisible to the naked eye, show a finish and delicacy which the utmost powers of the finest microscope cannot trace into roughness. Besides, your tastes for natural history are at a particularly low ebb when you can like nothing but *denaturalized* shells, pretty as they are!"

"But I can't like the other things, knowing nothing about them, aunt."

"Well, then, for a few minutes let us stop here. Suppose that the smuggler's tale is over, and that *you* have turned away to think, and *he* to finish his quid of tobacco. Suppose, too, that the wind is so high (a south wind observe, and therefore not cold), that your sketch must be suspended—what is to hinder your coming with me to shelter between two large boats that are hauled up on the shore? Come! there is a piece of tarpaulin lying there, and we will sit down. It will not be as dull as you suppose."

"I don't expect it to be dull a bit, aunt. I am as ready to sit there as you are. The very smell of the tar is enough to make me like it."

"Very well! Then, there we are. Now, just by the

edge of the tarpaulin to the left you will see a nasty mound of dirty shells. 'How came they there?' you will ask. Thus: they were thrown over the side of the boat after she was hauled up on the beach. I suspect the sailors used the fish last night either for bait or supper. Well: they are only waiting for the next tide to wash them back into the deep."

"Joy go with them, my dear aunt!" cried Eleanor.

"Now, I am quite disappointed in you, Eleanor! I thought you were fond of shells."

"So I am of nice polished ones, aunt; but not of the nasty heaps I once before saw on a beach. They had such a dreadful smell, the very thought of it makes me sick!"

"Ah, Eleanor!" cried Mrs. Mortimer: "you have much to learn yet, I see. It is a great fact, that *naturalists have no noses*, and if you are coming to sit by me on the tarpaulin, you must leave your nose on the Parade with the well-dressed ladies who never descend the fishermen's steps, but look upon them as little better than a plunge into Avernus."

"I am quite prepared, aunt. I will leave my nose, or fix it solely on the idea of tar. Anything to come and sit with you."

"Well, now, those shells are great favourites of mine, so I must introduce them to you. They are called 'Pectens;' and there are two varieties of them there. Some mottled and some white, all but the raised ribs, which are a delicate pink or yellow."

"Why, these are the shells that used to be made into such pretty pincushions and ornaments, aunt?"

"The very same."

"But you talked about a mound of dirty shells. I had no idea those pretty little pectens were there. How I

should like to drill the holes, and try to make one of the pincushions! How could you call those pretty shells nasty and dirty, aunt?"

"Everything is nasty till it is washed, Eleanor; such is the fate of mortality; and our friends, the pectens, want a strong lotion from the chemist's shop besides, before all their beauties are developed. But, for my own part, I prefer them—at least the oldest and ugliest among them,—in their natural state, merely washing them in sea-water."

"Explain, aunt."

"Why, those which are most disfigured by scurfy incrustations, bear on their backs some of those wonders which only a microscope can fully reveal to our eyes. But a pocket magnifier or lens can do much, and show you, that those, to the naked eye, disfiguring incrustations, are actually households of little creatures, who have built themselves cells, side by side, diamond-wise, with the nicest regularity; and whose skill in ornamental cottage-building exceeds even that of bees, for in their houses there is no variety, whereas, among the creatures of whom I am speaking, different patterns of houses have prevailed ever since they were created. The finest microscope can show *us* no difference in the little creatures inhabiting the cells; but the race of *Lepraliæ*, as they are called, is divided, as it were, into classes, and each class is as particular and precise in the pattern of his house as a Highlander can be about that of his tartan! Is not this curious? There are more than forty clans of these little *Lepraliæ* on our British shores only, and there are plenty of others abroad. What do you say now to my dirty shells? Think of the thousands of little creatures—each the inhabitant of his self-built cell—living his appointed lifetime of enjoyment in his 'dim water-world,' on the back of the Pecten, who moves unconscious of his freight. Many of the *Lepraliæ* prefer building on sea-

weeds rather than shells, and many on stones, and some are so particular that it is only on one or two particular weeds they are found: a choice that, like the patterns of their cells, must of course be directed by some mysterious instinct, and proves that these minute creatures are no more forgotten by the great Creator than those who rank higher in the scale of life. Now, then, I have introduced you to a zoophyte. But we cannot stay longer with him. Neither will I, for your young naturalist's nose's sake, poke far into the mound, or doubtless I could drag out thence a small cuttle-fish: another of the fleshy fishes of untidy shape which look so disgusting. He is, indeed, a lump of flesh, all but his mouth, which is a miniature parrot's beak, and hard and horny as that of a bird. Inside he carries about with him his bag of brown ink, which he can throw out at pleasure in the face of any enemy daring to pursue him. But you will, I am sure, prefer seeing the ink in its prepared and refined state when sold in the shops under the name of sepia."

"I should most particularly like to see it in its natural state as well," observed Eleanor. "But I am almost overpowered by the thought of all that exists in the world, unnoticed by so many people. There seems to be almost *too* much, aunt—it burdens one's mind."

"Ay! but who would be so vain or mad as to do more than be happy and contented with the particular researches or occupations that Providence throws in his way, or that really interest and attract his mind? Of all mistakes none is more grievous than the rage for heaping up knowledge merely for knowledge's sake:—crowding one study upon another till the heart is interested in none, and till learning becomes a burden, or a cause of conceit, instead of a resource and comfort. But, come! we will leave the 'dim water-world,' and its inhabitants, to others, and you shall bid good-bye to the beach, and cut across, among the tall

tarred rope-houses, to a pathway that runs underneath high overhanging cliffs, to a distant part of the beach. We are past the end of the town here — nay, and, shortly after, we have reached the last of the rope-houses: so now, stop and tell me what you see.”

Eleanor looked up, almost feeling as if she ought to be able to answer.

“Yes, yes,” continued Mrs. Mortimer, as if it had all been real; “you may turn completely round if you please, and you must look up, and then down, and then I will tell you exactly what you see. First, right opposite to you as you stand with your back to the rock, is a tilted cart, with the shafts raised on wooden props. Yes. Nothing very wonderful in that, you say. Well, if you think so, look again. Take another turn, and look *up* this time. Now, you are standing with your back to the tilted cart and your face to the rocky cliff. Do you see nothing? Nothing! You shake your head. Look a little higher — up the cliff — higher — higher still. Ay! Now you’ve caught it, for I see you smile. You have caught sight of a window with actual panes of glass and woodwork in the rock, level with the rock, ever so high up.”

“My dear aunt, you are getting a little romantic, I think,” cried Eleanor, half thinking her aunt was making fun of her.

“I have been romantic all my life, I hope,” observed Mrs. Mortimer, with a smile; “but here I have a reality as well as a romance. By looking steadily upward you perceive that at a short distance below the window, there is a jutting ledge of rock, like a pathway; and all at once this fact is verified by a human figure appearing upon it. He came out of a dark-looking fissure to the right of the window, and now he is actually walking along that ledge of rock I spoke of; and now, if he is not standing there with

a long broom in his hand, sweeping off the dust and dirt from the narrow pathway that stretches like a rocky shelf across the cliff, more than half-way up its high and precipitous side! And, after the sweeping is over, you may see him walking up and down the ledge with a placid air, looking over the sea, and evidently observing what ships are in the offing, for he is studying them through his telescope. There is a Parade for you, Eleanor! Quite a different sort of thing from the other one."

"Aunt, if the place had nothing else to recommend it but the man in the rock, I would go there to see him, I think."

"The place has a great many more things to recommend it though," observed Mrs. Mortimer; "for the man has a wife and several children, and, besides that, a regular farm establishment up in his home in the rock. I remember, when I was up there——"

"You were up there!—actually up in the man's place yourself, aunt! and one *can* get up?" interrupted Eleanor.

"Decidedly," was Mrs. Mortimer's answer.

"And you saw ——"

"Pigs, and a donkey, and ducks, and hens, and chickens, and guinea-pigs, and turtle-doves, and a great many more 'beasts' than anybody but an Irishman could have borne in such close quarters."

"And he is an Irishman, then?" said Eleanor.

"Yes."

"And what is his name?"

"Excuse me, my dear, I decline any questions about names at present. He is an Irishman, and careless and poor; but at the same time ingenious and witty. And so, being unable to pay rent for a cottage after the usual fashion, and having noticed several holes or caves in that part of the cliff, he bethought himself of turning the caves

into rooms, pigstyes, and sheds; and by glazing over a large opening that formed a window in the principal cave, and also by very cleverly contriving a sort of chimney through a crevice enlarged, he got a really very decent sitting-room with a fireplace in it, and with such an amount of furniture—even including three or four books—as made it look quite respectable. For the accommodation thus obtained, the poor Irishman pays a shilling a-year to the Lord of the Manor; and there he has lived for many, many years. His pigstyes are not without the ornament of a tidy gate, and he carries on a profitable trade with his ducks and hens; and in a sort of ‘entrance-hall’ to his principal room, I observed rabbits and a squirrel in a cage, showing that the man keeps animals from a sentiment of regard, as well as merely for use. There seemed, indeed, to me to be a fine Robinson-Crusoe spirit over the whole affair.”

“There is, indeed,” said Eleanor. “Is it difficult to get up?”

“Very, Eleanor; but there is always a bevy of sailor lads lingering about the ascent if they see a stranger approaching. These boys are of great use, and, indeed, you can scarcely do without their assistance, though I must confess, their roguish faces, half bursting into a laugh at the folly of ‘madam’ in wanting to go up, made me very ambitious of managing the ascent without them. But I could not succeed, and was at last glad to take the proffered arm. And your cousin, who was with me, and was then a mere child, was escorted up by a sailor lad on each side of him holding up his arms and leading him forward.”

“What a lion the man in the rock must be for the watering-place! I suppose everybody goes to see him?” observed Eleanor.

“Not a bit of it, my dear. Of the hundreds upon hundreds who flock yearly to the place, I question if there

are a dozen who know of the existence of the Crusoe of the Cliff, or ever saw his window; though, by the way, I have observed it from the sea with the sun lighting it up, glittering in the distance almost like a light-house. The dwelling altogether reminds one forcibly of the prints in Keith's 'Prophecies' of the rocky homes at Petra."

"But how is it, my dear, dear aunt," asked Eleanor, "that the visitors of the place never go to see such a curious sight?"

"Partly from its situation among the rope-sheds and fishing tackle, I fancy, my dear."

"But why is that a reason, aunt?"

"Because so many people cannot energize sufficiently to break away from routine, from the regular London-looking streets, and houses, and parades, and drives. The path that leads to the cliff is at the back of the town, and I own that there is an odour of fish in the neighbourhood which offends delicate noses. It is only naturalists that have no noses, remember. I cannot myself say that the smell of fish and tobacco is absolutely charming, Eleanor; but I do maintain that the cuttle-fishes, and the shells, and the rope-houses, and the Crusoes in the Cliff, fully counterbalance the trifling annoyance."

"Besides, if the people always move in one set way, they must find every place dull."

"That is just what they *do* do, Eleanor, and rail at it for its stupidity, when, in fact, they know nothing of its most amusing side. But how easily they might know! How easily could I, or any one, who, from age or circumstances, was unencumbered by conventionalities, introduce young folks, at any rate, to interesting views of every place on God's earth, even Hastings included? However, I have one more thing to relate, though I see you are as fidgety as a starting colt."

“I really, aunt, don’t want you to say any more about the place. I mean, that if you and my uncle will only go there, I shall be delighted; for I would rather go there than anywhere, whether it is really Dover or not.”

“Very well. But still you must hear the old woman’s story out. Remember now! Before you turned round and saw the window in the rock, you saw a tilted cart propped up by the side of the road. Nothing but that, you said, and yet that cart,—that tilted cart,—is almost as interesting an affair as the home in the rock.”

Eleanor looked up at her aunt in doubt, and shook her head.

“Very well, Eleanor. You are just as obstinate after all as the ladies on the Parade. They will have nothing but a parade turn-out, and you will have nothing just now but a house in a rock. You are, all of you, one as wise as the other.”

“I give in, my dear aunt,—I give in. Go on. I am all attention. I will look down most amiably from the house in the rock upon the tilted cart on the other side of the path.”

“You will do well, my dear,” observed Mrs. Mortimer. “Look at the cart amiably,—ay, and attentively; for do you not see a little ladder of steps going up to the front of it from the ground?”

“Oh! aunt, my *dear* aunt!” exclaimed Eleanor, and her work slipped from her knee upon the ground as she gazed in Mrs. Mortimer’s face, anticipating, yet not venturing to suggest what she thought she should hear next.

But Mrs. Mortimer turned her head and looked at her niece with a sweet but rather sad smile, as if some touching recollection had crossed her mind, and then Eleanor said, “The cart was inhabited too, aunt.”

“Exactly, my dear; it was another home—as strange

and poverty-stricken, if not as adventurous in its character, as the home in the rock. I have been up the little steps into the cart, Eleanor, as well as into the cavern home; and a strange sight I saw there. A poor woman was lying stretched out on a little pallet at the end of the cart, with a new-born baby in her arms. Between that narrow pallet and the entrance of the cart, a small iron tube had been stuck up through an opening in the canvas as a temporary chimney; and at the bottom of it burned a small fire, and on the fire was a little pot, in which some gruel was being warmed for the poor sick mother. Some woman, of sheer kind-heartedness, had come in for half-an-hour to help her, give her the gruel, and see if she wanted anything unusual: but when I appeared at the foot of the steps, the woman came down to make way for me to go up, for the place could hardly hold three people. How do you feel now about the tilted cart, my dear? Are you tired of it?"

"I should hate myself if I were not deeply interested, aunt," said Eleanor, looking down and speaking very earnestly. "But do tell me how you came to think of going up into the cart?"

"By an accident; although only a visitor at the place, I had got to know the family in the cart, my dear. The poor woman's eldest daughter, a strong rough girl of fourteen, was in the daily habit of collecting the sea-weeds and zoophytes that were washed up by the morning's tide, and hawking them about the town for sale. She had come to my lodgings among other places, and I always sent for her saucers of treasures into my room, and generally bought something of her. Poor girl! great were the pains she took to wash and arrange the different tinted sea-weeds so as to give a pretty effect to her wares; and at last she and I got to be great friends, and a compact was entered into between us that I was to have the refusal of her collection

every day, before she showed it to any one else. It suited both her and me; for the gay pink and green ones that were most attractive I rarely wanted, but purchased of her many a curious dirty-looking thing which would have gone a-begging on the Parade; and at last the girl got to know so well the kind of things I wanted, that she would sometimes say herself, 'I have got nothing to-day, ma'am, that will suit you. They are only what you have had before.' As soon as her sea-weeds were sold, she invested a small sum of money in oranges, and in hawking these, she passed the rest of her wandering day—at least all the time that could be spared from her mother. I have known her walk a distance of four miles in the early morning to gather sea-weeds from the rocks, when the tide did not serve her purpose in drifting them ashore, and afterwards go back to the same place in the afternoon to sell her oranges in the town there, coming back to her cart-home late at night. Our many interviews led to inquiry as to her mode of life and place of abode; and in this manner I became acquainted with the family in the cart, and hurried off to see the poor mother when I heard of the arrival of the baby."

"Why did they live in a cart, aunt? do you know?" asked Eleanor.

"For the very same reason that the family over their heads lived in the rock. They could not afford to pay rent for a house. They came from some inland county, where the mother had, she assured me, respectable relations; but her husband having fallen into poverty (I fear by drinking, though she never said so), they could not 'for shame' stay among their friends. They did not like the disgrace, and so fixed upon this rambling life as a resource. I forget the husband's trade; but he had one. On fine nights, the woman said, the children (of whom there were five) slept underneath the cart. In bad weather they were all huddled

together inside. Four other children she had 'buried,' she said; and truly when I looked upon the poor little new-born babe, I could not but think the fate of 'burying' would be a greater boon to it than the fate of 'rearing' under such painful circumstances. They had visited the place I am describing for three successive years, so that they had got to feel it a kind of home. This woman's boys were always ready and willing to help any strangers up to the home in the Cliff; and if you could have heard the woman herself speak of the dwellers in the rock, you would certainly have thought she felt them to be objects of pity as well as curiosity. Yet I can well imagine with what contempt the ingenious Irishman above, would look down on the cart and its inhabitants, and feel that it was his superior genius that had raised him to a situation so much more desirable! You and I, Eleanor, would relish as little the trolloping, tramping life of my cart friends, as the dirt and uncouthness of the Irish folk, whose fowls and pigs lived with them in a sadly too free and intimate a manner to be quite agreeable. But still, as phases of human life, and as the life of creatures like ourselves, preparing 'through much tribulation' for a great eternity, I felt both the cases to be highly interesting, and often and often since I left the place, have I recalled the cavern-room with its solitary window, and strangest of all, its little shelf for books. How grand it must have been to watch a winter's storm through that casement! No winds that ever blew could shake that adamantine dwelling; and to watch the raging sea below them, must have been a strange and awful sight.—I could say a great deal more about the place, and describe an entrance to it unrivalled for beauty, down a hill embosomed by trees. On the one side, a romantic steep scattered over with rocks and furze, amidst which rose the grey old church; the town and castle being visible over the trees before you commenced the descent.

And above all, and beyond all, lying in peaceful relief against the red brick buildings, the bright blue sea, dotted over with white sails, and seen through an atmosphere balmy with the hope and promise of health—a hope which, in my case, was fully realised. . . . Come, Eleanor, ring the bell for tea, for I hear your uncle at the gate. Kiss me, my dear niece. I am wide awake now, and fancy that I see by your face that you have more faith in me than in Lady Charlotte Lennox. And certainly you must make your choice in my favour if you wish to see either the *Butlers* in their home in the Cliff, or the *Sweetloves* in their house in the cart; or to ascertain for yourself the insufferable dullness of ——”

“*Hastings!*” cried Eleanor, springing up and standing before her aunt with a glowing face and almost tearful eyes; and as she thus stood, the door opened and her uncle came in, and all unconscious of the excitement, said, “How odd that you should be talking of Hastings, my dear! You have not heard, mamma, have you, that I have had the unexpected offer of a house there, and we must start to-morrow!”

“Aunt,” said Eleanor, when they parted at night, her face radiant with delight, “I hope I have learnt a lesson for life.”

M. G.

LIFE, IN ITS HIGHER FORMS.

No. IV. (*continued*).

BIRDS.

WE well remember the wondering delight with which, in childish days, we gazed on a Chaffinch's nest. An elder companion had found it in the fork of an oak, and climbing up to the place, he drew aside the leafy twigs, and revealed the beautiful little dwelling to our eager eyes. The particular construction of that particular one, we cannot, of course, pretend to describe, for it is a great many years ago, and the note-book was not then so familiar to our hand as it has been since, but a vivid impression of the general appearance remains. Indeed, the spruce, smart little Chaffy builds one of the prettiest of British nests; the Goldfinch's is somewhat more compact, and, being composed more of one substance, is neater, but we scarcely know whether we do not more admire the Chaffinch's. Of course you have seen both; Chaffy's certainly, because it is so common and so easily found.

What a beautiful cup of interwoven moss it is!—at least the frame-work, the exterior! The pretty feather-moss (*Hypnum*) is chosen for this, because it grows in long strings, and binds well together; but this is only the outer wall. Wool is the staple; you may see the busy birds in spring collecting the straggling tufts of wool that hang on the thorn-bushes around the sheep-pasture, and carrying off the prizes in their bills: watch one home, and you will have no difficulty in discovering the whereabouts of its domestic economy. But be merciful; look, but touch not! Well does the skilful little architect know the *felting* pro-

perties of wool! how, when the fibres are placed in contact, and rubbed and pressed, they unite and bind together into a cloth-like texture, like the substance of a hat, or a piece of drugget. God has put into her feeble sensorium this instinctive knowledge, and how effectively she uses it! Tuft after tuft of wool is brought, pulled and spread out thin, and applied to the interior of the mossy cup, each layer placed evenly round, so that the thickness shall grow uniformly, and each addition united to the fixed portion by the pressure of the bird's breast, she sitting in the hollow and moving briskly round and round, pressing the wool with all the force of which she is capable. A sort of sewing process goes on at the same time; for individual fibres of the wool are passed around projecting branches of the moss, and being inserted into the walls by means of the bill, are seized on the opposite side, drawn tight, and passed through again and again, every effort adding to the strength, compactness, and neat appearance of the growing nest. The united cobwebs of the spiders that lurk in hedges and banks are also brought into requisition for this sewing work; bits of cotton and thread from the neighbouring dwellings, and many other substances: and thus the house is made. But it is not quite ready yet; it must be strengthened on the outside, by intertwinning long strings of moss around the contiguous branches, and binding them with felted wool, thus weaving the bush itself into the common structure. It is because of this connexion that it is next to impossible to take a nest without so damaging it as nearly to destroy all its beauty; it cannot be removed without being almost torn to pieces. Then it must be adorned with little bits of grey and yellow and green lichens, stuck on the outside and bound down with cobweb, which doubtless greatly improve the beauty of their house in the eyes of the tasteful owners,—Mr. and Mrs. Chaffy.

Well, then, the exterior is finished:—now it must be lined. Moss and wool are soft and warm, but something softer and warmer must be procured before it is a fit cradle for five naked tender birdlings. Besides, it must be made smoother than it is. Now the birds go a-searching along the lanes and over the commons for stray hairs, especially those of cows and of rabbits and hares; these they introduce, and coiling them round the cavity, render it beautifully smooth and globular. The soft small body-feathers of other birds are then sought, particularly those of the ducks in the farm-yard, and interwoven with the hair; and the structure, now complete, is looked on with complacency by the industrious pair. The Chaffinch, however, does not make so much use of feathers for lining as some other of our small birds.

The Goldfinch, as we have said above, makes a more compact structure than this, as it is careful not to leave a single projecting sprig of moss or filament of down, binding down the whole into a smoothly felted surface. It is fond of moss and wool, but does not much use hair or feathers for a lining, preferring the down of catkins, of the coltsfoot, cotton-grass, and other downy plants of the season. It has been, however, observed, that birds will commonly take the materials for building which they can most easily procure, within certain limits of resemblance of course, and always having regard to their suitability, and to the general plan and style of the building. “On the 10th of May, 1792,” says Bolton, “I observed a pair of goldfinches beginning to make their nest in my garden; they had formed the groundwork with moss, grass, &c., as usual, but on my scattering small parcels of wool in different parts of the garden, they in a great measure left off the use of their own stuff, and employed the wool. Afterwards I gave them cotton, on which they rejected the wool, and proceeded with the

cotton; the third day I supplied them with fine down, on which they forsook both the other, and finished their work with this last article. The nest, when completed, was somewhat larger than is usually made by this bird, but retained the pretty roundness of figure and neatness of workmanship which is proper to the goldfinch.”*

But we, in this country, have no nest that can compare for neatness with the tiny structures built by the Humming-birds of the Western hemisphere. That of the smallest of birds, the Vervain Humming-bird (*Mellisuga humilis*) of Jamaica, we have often had an opportunity of seeing in those lovely hesperidan glades. It is usually affixed to the upper side of a horizontal twig of bamboo, just over a joint, so that the diverging twigs are embraced by its foundation. Fancy a little hemispherical cup, about as big as the half of a walnut, made of a bay-coloured down, the produce of the silk-cotton tree, most compactly interwoven, and mingled with the glossy down of an *Asclepias*. Externally it is quite covered with spiders' webs, crossed and recrossed in every direction, and made to adhere by some viscous substance, evidently applied after the web was placed, probably the saliva of the bird. These webs are used to confine little bits of pale-green lichen, which are stuck about here and there, and impart a rustic prettiness to it. To see a bird sitting in a cup like this is very amusing; small as is the species, it seems impossible that it should be able to crumple itself up sufficiently to be contained in so tiny a cavity, especially when two eggs are lodged in the bottom; but the incubation is managed. The head and tail are both excluded, the latter projecting erect; the belly and feet alone are contained within the circumference, which they completely fill.

* “*Harmonia Ruralis*,” i. Pref.

A volume* of great interest has been written, devoted exclusively to the various kinds, forms, and materials of birds' nests; and the subject is far from exhausted. We, as yet, know comparatively little of the nests which are constructed by the hundreds of species of birds from foreign, especially intertropical, countries, that crowd the shelves of our museums. Yet, among those with which intelligent travellers have made us acquainted, are found some of the most curious and admirable examples of the constructive faculty.

Thus the Baya, or Indian Sparrow (*Ploceus Philippensis*), described by Sir William Jones and others, is said to make a nest "of grass, which he weaves like cloth, and shapes like a bottle, suspending it firmly on the branches, but so as to rock with the wind, and placing it with its entrance downward to secure it from the birds of prey. His nest is usually suspended over water, and it is popularly believed that he lights them with fire-flies, which he is said to catch alive at night, and confine with moist clay or with cow-dung."

This novel mode of lamp-lighting is so strange, and almost incredible, that it has been doubted by some; but the testimony of independent observers of veracity, who set themselves to examine the facts, confirms the vulgar supposition, that illumination is the object desired.

The interior of this pensile nest contains several apartments, used by the parent birds for different purposes: one of them, consisting of a little thatched roof over a perch, without a bottom, protects the cock-bird from the sun or rain, as he cheers the sitting hen with his song.†

In South Africa, a curious pendent nest is formed by the Tchitrec, one of the flycatchers. Le Vaillant thus

* Rennie's "Architecture of Birds." London, 1831.

† Forbes's "Oriental Memoirs," i. 119.

describes it, on the authority of his intelligent Hottentot hunter, Klaas: "In one of our journeys through a wood of mimosas, in the country of the Caffres, he discovered and brought me this nest, having seen, he said, and particularly observed, a male and female Tchitrec occupied in constructing it. It is remarkable for its peculiar form, bearing a strong resemblance to a small horn, suspended with the point downwards, between two branches. Its greatest diameter was two inches and a half, and gradually diminishing towards the base. It would be difficult to explain the principle upon which such a nest had been built, particularly as three-fourths of it appeared to be entirely useless and idly made; for the part which was to contain the eggs, and which was alone indispensable, was not more than three inches from the surface. All the rest of this edifice, which was a tissue closely and laboriously woven of slender threads taken from the bark of certain shrubs, seemed to be totally useless. The interior of the nest was not furnished with any sort of soft material, such as down, wool, or hair; but as the female had not laid her eggs when Klaas brought it to me, it is probable that the nest was not quite finished; a fact, indeed, proved by the birds being still at work at the time."*

In Jamaica, we have seen an interesting nest made by a Starling, of brilliant black and yellow plumage, and provincially known as the Banana bird (*Icterus leucopteryx*). It is a deep purse, suspended by two opposite points of its margin, between two parallel twigs of a tree, and composed sometimes of horse-hair, sometimes of long vegetable fibres, which can scarcely be distinguished from hair. "The hairs or threads are procured one by one, and carried to the selected spot, where they are deposited in a loose heap. From this accumulated mass of material, the work is carried

* "Ois. d'Afrique," iii. 129.

on, and progresses rapidly when once begun. When a few threads are laid and interlaced for the base, the work becomes perceptible and interesting. Both birds work together; one, taking a thread and weaving in one end, holds down the loose part with his beak, while his mate takes the ends of others projecting, and lays them tightly down over it, interweaving them with others. Other threads are crossed in the same manner, in every direction, until a slight but very compact purse is made, resembling a loose cloth. As it hangs, the texture is so thin, that a person below can discern the eggs or young within.”*

An old lady in America, to whom Wilson was showing a similar nest to this, asked him, half in jest, half in earnest, if he did not think it possible that birds might be taught to darn stockings. There are some nests in the British Museum, which half incline us to think that the owners might learn to hem handkerchiefs. They are those of the Tailor-bird of India (*Orthotomus longicauda*), a beautifully plumaged member of the family of the Warblers. “It first selects a plant with large leaves, and then gathers cotton from the shrub, spins it to a thread by means of its long bill and slender feet, and then, as with a needle, *sews the leaves neatly together* to conceal its nest. . . . Often,” says the describer, “have I watched the progress of an industrious pair of Tailor-birds in my garden, from their first choice of a plant, until the completion of the nest and the enlargement of the young.”† Other authorities affirm that it “*picks up a dead leaf and sews it to the side of a living one.*”

One of our native birds, the Long-tailed Tit (*Parus caudatus*), familiarly known by the homely names of “Poke-pudding,” “Long Tom,” &c., makes a nest which has been much admired for the ingenuity of its construction, com-

* “Birds of Jamaica,” 228.

† Forbes’s “Oriental Memoirs,” i. 55.

bining security, warmth, compactness, and beauty. It is a hollow ball of moss and wool, profusely lined with soft feathers, and having only a small hole for entrance; not unfrequently the structure is prolonged into the shape of a bottle, the entrance being through the neck. But the bottle-nests of the Pensile Grosbeak of Africa (*Loxia pensilis*) far exceed ours in ingenious adaptation for security and defence. Pringle describes them as suspended, twenty or more from a single tree, attached to the tips of those twigs that hang over a precipice. The body of the nest is spherical, and the entrance, which is always from below, is through a cylindrical gallery of twelve or fifteen inches in length, which projects from the body, exactly like the neck of a chemist's retort. The whole fabric is most ingeniously and elegantly woven of a species of very tough grass. The object of the precaution displayed in the construction, and in the position chosen, is evidently the protection of the eggs and young from the baboons and monkeys that would otherwise devour them.*

We must reluctantly close our enumeration of singular nests, with one, whose chief curiosity is the exhibition of that social instinct, which, as in the bees, wasps, and ants, among Insects, prompts each individual to work on a common plan for the general good. The Pensile Grosbeaks, just described, associate in their domestic economy, but there is no union of labour. Another bird of the same family, and of the same country,—the Sociable Grosbeak (*Loxia socia*) of South Africa, builds in concert a huge irregular sloping roof of thatch around the stem of a tall tree, beneath the eaves of which each pair of birds builds its own nest. So numerous are they, however, that the nests are in contact with each other, and appear to form but one structure, distinguished only by the little aperture of each. Le

* Ephemerides.

Vaillant describes one roof which he examined, which contained beneath its eaves three hundred and twenty inhabited cells.

We have devoted this article to nests; but there are some examples of architectural skill among birds, which require a passing notice, though they are constructed for a very different purpose. We allude to the playing galleries of the Bower-birds of Australia, specimens of which may be seen in the British Museum and in the Zoological Gardens at the Regent's Park. The Spotted Bower-bird (*Chlamydera maculata*), for instance, collects twigs and sticks, and builds them so as to form a long tunnel or gallery, cylindrical interiorly, where it is lined with long grass. The birds then bring together large quantities of stones, shells, and fragments of bone, with which the floor is paved; this pavement, which expands beyond the opening at each end, serves to strengthen the structure and keep it steady. Besides this, they carefully search for the gaily-coloured feathers of parrots and other birds, which they interweave into the sides of their bower, and also arrange the whitest stones and shells in the most conspicuous places, with a keen eye to ornament. The gallery being complete, the birds use it for play, chasing each other through it; and that not only by pairs, but numerous individuals associating to use (and, therefore, probably to build) the same gallery. One of these bowers, now in the British Museum, was, when found, four feet long and eighteen inches high.

P. H. G.

A NIGHT AMONG THE BREAKERS.

HAVING been appointed to go out on a special mission to Canada, I proceeded to Liverpool with the view of sailing from thence to New York. It was in 1846, and about the middle of September, when the best of the season was over, and when we had every reason to apprehend that the equinoctial gales, which very often set in about the end of that month, would overtake us in the course of the voyage. This was a source of considerable uneasiness to my companion, who had a nervous dread of the sea, and whose acquaintance with it had hitherto been confined to occasional trips along the coast. But apart from this there were other circumstances which made the prospect before us a subject of some anxiety, not only to her, but also to the most of our fellow-passengers.

At the time to which I refer sailing by steam across the Atlantic was scarcely past its experimental stage. Although the project had been tried, and the practicability of it fully established, there was still a considerable number, even of sensible people, who continued to question the perfect safety of this mode of transit, and who on that account preferred going by the packet-ships, or "liners," the most of which were yet on the station. It was especially doubted whether steamers of a large size could stand the strain of "the great sea;" and it was very generally believed that vessels of heavy tonnage, and of more than ordinary length of keel, were exposed to special risks arising from the peculiar nature of the navigation. Persons experienced in these matters were heard to declare that such vessels were by no means well fitted to contend with

the "crested wrath" of the Atlantic; and they brought forward many reasons to show that it was almost impossible they could ride over the tops of its great Alpine ridges without having their timbers started, their backs broken, and their machinery loosened and shaken to pieces. These speculations were, no doubt, suggested in a great degree by the fate of the famous monster ship the "President," whose mysterious disappearance during the previous winter had left a deep impression on the public mind.

Now it so happened that the vessel in which berths had been engaged for us was the "Great Britain," the largest steam-ship ever built, with the single exception of the President herself. But, besides her immense size, she had also been fitted up with the screw-propeller—another dangerous feature, as was thought at the time—and was the first that ventured on such a long and stormy voyage without the steadying and approved *support* of the broad paddle-wheels. To add to all the other insecurities of the case, our Captain, a brave and enterprising naval officer, had taken it into his head to shorten the passage by cutting right out through the North Channel, instead of following the safer, though more circuitous route by which his predecessors sought their way to the open sea.

There was, however, one consideration which tended to relieve the fears of many, and to reassure the minds of most, namely, that the Great Britain had already accomplished one trip to America and back again, not only with entire safety, but with complete success. It was also well understood that she was sound and sea-worthy in every sense, that the utmost care had been bestowed upon her construction, and that she was in reality the strongest as well as the finest specimen of naval architecture that had ever been launched from the celebrated dockyards of the Clyde. This was to some extent visible in her very aspect. In

spite of her vast dimensions she had no appearance of unwieldiness about her. On the contrary, she sat lightly on the water, was moved and managed with the greatest ease, and looked, as she was, a perfect model of grace and beauty. On this account she attracted much notice at the time, and was in fact one of the great sights of the day. People came from all parts of England to obtain a view of her; and on the morning on which we left, Liverpool was crowded with strangers, collected together from every quarter, for the purpose of seeing her set off on her second voyage to the New World. Besides being laden with a large and valuable cargo, there were upwards of three hundred and eighty passengers for whom berths had been taken on board of her. The weather was on the whole favourable, for though the sky looked somewhat dull and cloudy, there was no rain, and comparatively little wind. As we proceeded to the Cobourg Dock we found the streets and wharves in the neighbourhood filled with a dense throng of spectators. Though it still wanted a couple of hours of the time of starting, the thoroughfares were already so completely choked up that it was with some difficulty we forced our way to the place of embarkation. This crowd, as we were told, had begun to assemble before the sun was well up, and there they were contented to stand hours upon hours, with their faces turned towards the spot where the steamer was lying, eagerly waiting for the moment of her departure. As that moment approached these congregated thousands, pressed together by continual accessions, assumed the appearance of one fixed immovable mass, steady as a wall, and at last nearly as still as a stone. It is no fanciful statement to say that they were "all eye." They seemed afraid to withdraw their glance even for an instant, lest the object of their curiosity should suddenly dart out from the stone basin in which she was locked, and

disappear from their view before they had time to get a sight of her.

The hour of sailing at length arrived, and, punctual to her time, the Great Britain moved slowly out of her berth, and rested for a little over her anchor in the stream. There was a suppressed cry from the crowd as she appeared, but it was quieted immediately again. During this interval, and while the engineers were engaged in feeding the furnaces and getting up the steam, the vessel shook several times from stem to stern. Simple and natural as the circumstance was, the impression it produced was so curious that I was led to mark it particularly. It was for all the world like the tremors and quiverings of high-wrought emotion. It seemed as if the great ship was actually conscious of the trial that was before her, as well as of the intense interest felt about her, and was seized with fits of trembling excitement, which ran through every fibre of her huge frame in successive thrills of nervous agitation. In the course of a few minutes all was ready. The pilot took his place at the helm, the captain on the gangway, the officers at their respective stations, and the Great Britain, covered with a brilliant array of flags and pennons, which bent over her like a rainbow, slipped her cable and started down the stream, wreathed in the smoke and fire of her own guns. This parting salute was immediately answered by several of the shore batteries, whose discharges were met, and muffled, and almost drowned by the mighty roar that broke from the immense multitudes around the docks; which roar was at the same moment caught up and re-echoed by multitudes equally immense who now appeared on the opposite side of the river. As we moved down through the busy tiers of merchantmen that lined the banks and loaded the bosom of the Mersey, we found their decks crowded with spectators, and their rigging covered

with their crews, who hailed and followed us with renewed hurrahs upon hurrahs as we approached, and passed them by. Such a rolling whirlwind of admiration and enthusiasm I never witnessed. The passengers on board, though evidently stunned at the extent of it, soon caught the infection. Shaking off the sad thoughts which hung heavily on the minds of many of them, after parting with friends and kindred whom they might never see again, they tried as well as they could to acknowledge the cheers which were still sent after them, both from the shipping and the shore ; and to join in the acclamations of applause that were heaped upon the noble and beautiful ship, with whose fortunes their own were, for the time, so closely associated. When we had cleared the narrows of the river, and opened up the breadth of the channel, the captain ordered the sails to be set. The breeze which had freshened a little since the morning, blew right after us ; and as the Great Britain united the qualities of a fast-sailing barque with those of a steamer she was soon enveloped in a snowy cloud of canvas, and scudding along at the rate of seventeen knots an hour, after receiving the most splendid ovation that had ever been conferred on any private ship before.

Having had no sleep on the previous night, and feeling also somewhat exhausted by the painful leave-takings and public rejoicings which followed each other in strange confusion during the day, we retired to our cabin immediately after dinner, in the hope of securing a little rest. We soon discovered, however, that this was a vain expectation. The ship was as full of racketing and noise as a country inn in the height of a fair. What with the many hundreds who were pacing back and forwards overhead, and the multitudes more who were chattering away in the adjoining saloon, it was plain enough that there was no chance of rest for us, or for anybody else, as long at least as

the sea kept quiet, and the daylight lasted. We therefore proceeded upwards to breathe the fresh air, and to have another parting look at "the white cliffs of Albion." We found the great body of our recent messmates assembled on deck. It was what sailors call a *flush-deck*, that is, open and level from end to end of the vessel; and such was the extraordinary size and solidity of the Great Britain that it looked, with all these promenaders moving about it, far more like the street of a city or the esplanade of a palace, than the deck of a ship, that was not merely floating, but almost literally flying through the sea.

It was now between four and five in the evening. The sky, which had opened up a little in the course of the afternoon, letting out some straggling rays and occasionally long slanting sheets of grey light, had again assumed a leaden and lowering aspect; and, on looking towards the land, we were disappointed to find that it was no longer visible. A drizzly fog, which was fast sweeping out seawards, hid it completely from our view. We were passing near the Isle of Man by this time, and there were many strangers on board who were anxious to get a sight of it, but nothing could be discovered beyond the dim outline of the hills looming darkly through the haze. The evening breeze felt so moist and chilly, that after taking a few turns we were glad to adjourn to the saloon again; and there we tried to amuse ourselves by watching the different groups that were scattered about us; in order, if possible, to form some idea of the social ingredients of which they were composed. The first glance at the motley assemblage sufficed to show us that these ingredients were as various and heterogeneous as the contents of a witch's caldron. While the great majority, as might be expected, consisted of English and Americans, there was at the same time a large infusion of foreigners; and by questioning one of the

stewards on the subject I ascertained that we had passengers on board from nearly every part of the world. They were of all ranks and professions, including counts, ambassadors, scientific professors, literary writers, lawyers, physicians, divines, &c. &c., besides mercantile men and commercial travellers without number. My informant told me in particular, and with a sort of sly chuckle at the contrast, that among them was Madame *Somebody* (I forget her name) with her band of Bavarian singing-girls, and no fewer than fifteen clergymen to keep them all in order besides. As the evening advanced the saloon assumed a very gay and animated appearance. Those who were not contented with books or conversation had recourse to various devices by way of finding amusement for themselves. Some took to chess-playing, some to draughts, some to cards, and other similar games ; but I was glad to find that the prevailing taste ran in favour of music. Among the ladies there was discovered a number of first-rate musical performers, who very kindly played and sang during the most of the evening. Up to the time that we left, the piano continued to be surrounded by a large circle of interested listeners, many of whom joined in the songs that were sung with considerable taste, so that the hum of voices in the saloon was laid and harmonised by the pleasant stream of melody which kept issuing from this quarter.

As it drew towards nine o'clock we retired once more to our cabin, and after devoting some time to private reading and prayer, I was thankful to observe that my dear fellow-voyager had, in a great degree, recovered her composure, and was now rather disposed to smile at the imaginary fears which had haunted her for some days past. This gave me all the greater comfort, as it held out the hope that she would be able to take some rest, of which she had had so little for several nights before, that I was really

afraid lest she should fall ill on the voyage. Much relieved by this thought, I threw myself half-dressed into my berth, and fairly overcome with sleep, I dropped at once into the land of dreams, despite of all the singing, and drumming, and talking, that was going on in the saloon. This state of unconsciousness, however, was but of short duration. It could not have lasted more than ten minutes, when I was awakened by a sudden pull, accompanied by a sharp sense of pain in my right arm. Starting up, I found that my wife had hold of it, and was clinging to it with a convulsive grasp. "Oh, there is something wrong!" she cried. "Rise! rise! Don't you hear the confusion on deck?" At the same instant I heard the captain shouting from the gangway, "Stop her!—stop her! Let go the sheets! Down with the sails!" This was accompanied by a rush of feet across the decks, and by sounds and motions from beneath of the most alarming nature. The dreadful truth flashed upon me at once. The Great Britain was aground! Her bottom was grating against the rocks, and we felt her plunging and struggling forward, as if in a state of mortal agony!

In the midst of all this I was up and dressing. Having only my coat and shoes to put on, I was on my way to the quarter-deck in the course of a few seconds. The sight that met me in passing through the saloon was one that I shall never forget. I had already, ere leaving our berth, heard shrieks of terror and confusion proceeding from thence, intermingled with stifled groans and expressions of despair. "The ship is on the rocks!" "We are lost!—we are lost!" "O God, have mercy upon us!" Such were some of the expressions which broke from the crowd of miserable beings whom I had left but half-an-hour before in so different a mood—singing, and laughing, and chatting away in all the lightheartedness of social gaiety and thought-

less security ! It was not without some difficulty that I managed to make my way through this most painful and pitiable scene. The floor of the saloon was literally covered with poor women lying in dead fits, or rolling in violent convulsions, surrounded by groups of friends and relatives, who were themselves in such a state of distraction as to be able to afford them but little help.

When at last I reached the companion-door, the view which presented itself there was as wild and gloomy as possible. The night was pitch-dark ; the rain was pouring down in torrents ; the wind was whistling shrilly through the cordage of the ship, while the sea was hurling its billows up to her bulwarks, and sending its spray in thick drenching showers across her decks. The question which pressed itself upon my mind at this moment, and I suppose on the mind of every one on board, was this : " Where were we ? On what point had the vessel struck ? Was it on a sunken rock out at sea, or on some reef near the shore ? " If the former, there was but little probability that we should be saved, for the ship was heaving and plunging so heavily against the ground, that it was not possible she could stand these violent shocks for many hours without falling to pieces. If the latter, there was still, by the help of God, some chance of escape ; and I immediately set myself to provide for it by securing one of the life-buoys which I found hanging by the lee-side of the vessel. To this I intended to fasten my companion, and being myself a good swimmer, I could float by her side, and watch over her till I saw her safely landed on the shore. Whether it was owing to mere recklessness, or rather, as I hope, to the sustaining effect of a better feeling, I never lost my presence of mind for a moment. I was kept quite free from the influence of that frightful panic which had seized on almost every one on board, and was therefore enabled to

make my arrangements with the most perfect coolness and deliberation. Having done so, I was preparing to return down for the purpose of getting my friend on deck, when, to my great joy, I thought I could discover traces of land. By this time my eyes had become accustomed to the darkness, and peering keenly over the gunwale of the ship, with the life-buoy in my hand, I was sure that I saw the outlines of hills in the distance. Looking still farther around me, I observed, about half-a-mile a-head, a sudden ray thrown across the waters, which I knew at once to be the flash of a revolving lighthouse. It was now certain that land was near, and I felt a thrill of thankfulness the moment that conviction came home to my mind. There was yet, thank God, some hope of deliverance, even though the vessel should fall asunder, as was but too likely, from the fierce assaults of the waves, and from the tremendous force with which she was striking against the bottom. Hastening to our berth, for the purpose of telling my companion what I had seen, and announcing the plan I had formed in the event of the ship giving way, I was much pleased to find her in a state of wonderful composure, calmly engaged in reading her Bible, while in the saloon immediately beside her nothing could be heard but the most distressing moans and lamentations, accompanied by renewed screams of alarm at every lurch the vessel gave. One of the American ministers tried to tranquillise their minds, by offering up a prayer ; but the excitement under which they laboured was so great that few were in a condition to listen to him, and he proceeded, in the midst of such outcries and interruptions, both from above and below, that his voice indeed was scarcely heard ; so that his efforts, well meant and rightly directed as they were, had little or no effect in quieting the agitation that prevailed. After again committing ourselves to the protection of Him who

holds the waters in the hollow of His hand, I went upon deck a second time, with the view of ascertaining, if possible, on what part of the coast we had been cast away. The first person I met on landing above was the captain, to whom I put the question. He very frankly told me that he could not distinctly say where we were, but that if I would accompany him to his own room we could look over his charts together, and perhaps be able to form some idea of the matter. After examining these charts very carefully, and considering the track we should have followed, the time since we left Liverpool, together with the rate of speed at which we had been sailing, we fixed on a certain point on the Irish coast where the captain supposed we were then lying. This conjecture, however, turned out to be incorrect, and the reason why so little was known of the course which the vessel had kept is still involved in mystery. Indeed the causes of this strange and signal disaster, though they gave rise to much discussion and speculation at the time, have never yet been clearly explained.

Returning from the captain's room, I again took a close and particular survey of the circumstances in which we stood, as far as these could be discovered. The rain still continued to fall, and the night was dark as a wolf's mouth. By a gradual change in her position, the ship was now lying broadside on to the breakers, which on that account played upon her with additional force, and often made a clear breach over her. The shocks she received as they rushed in about her with a savage roar, raised her up bodily on the foaming crests, and then dashed her great colossal hulk on the rocks and stones which lay beneath her, were really stunning and awful. It was ruthless work. It seemed as if the waves were determined to bring down the pride of the Great Britain, and to show what they could do in the way of taking out the shine of that magnificent ship,

which had just enjoyed such a triumph, and excited such unprecedented admiration, as she sailed away from the shores of England, with her rainbow colours around her, amid the thunder of artillery and the deafening shouts of ten thousand voices. Strange it was to think, that at the very time when the whole country was astir about her; when the coffee-houses of London and Liverpool were ringing with accounts of her; when the reporters of the press were preparing their descriptions of her noble shape, her splendid appointments, her rich cargo, her crowded list of passengers, and vying with each other in their endeavours to give something like an adequate idea of the intense enthusiasm that was called forth by her grand and graceful appearance as she swept that morning out of the Mersey—it was, indeed, strange and suggestive to think that she was at that very time lying a shattered wreck in Dundrum Bay, prone on the rocks, scourged by the billows, grinding the hard boulders of the beach under her broken keel, and groaning through every joint of her bruised and dislocated frame? To add to the effect of this scene, already so striking and so solemn, as midnight approached a thunder-storm came on. The lightning darted from the black clouds overhead, blazed into the midst of the seething breakers, and glared in the faces of the pale and panic-stricken groups that strewed the decks, or lay crouched under the bulwarks. The roll of the thunder was heard mingling in terrific harmony with the roll of the waves, so that it was sometimes difficult to distinguish between them, or to say which was the loudest; or if a rattling peal from above made itself now and then distinctly audible, the sounds were almost immediately imitated and re-echoed by the crash from beneath, as the ship rose on the swell, and was hurled anew against the stony and gravelly ground. I could not have imagined a scene in which all the elements,

both of the natural and moral sublime, were so remarkably blended together. Looking at the state of the passengers within, and the state of nature without, there was here presented the nearest approach that I have ever been able to conceive to the highest laws and requisitions of tragedy.

It was now upwards of three hours since we struck. The ship was settling down into the bed which she had made for herself, and the tide had so far retired that her concussions were by no means so violent as they had been. The passengers appeared as if spent and exhausted by the force of their own emotions; and although there was much anxiety manifested on account of the continued uncertainty in which their fate was involved, yet the state of hysterical alarm which had prevailed for a time had gradually given way to sighs of dejection and to feelings of mingled resignation and grief. Taking advantage of this lull, two clergymen walked up together to the upper end of the saloon, and after stating that they were, the one a minister of the Church of England, and the other a minister of the Free Church of Scotland, they invited the passengers to come together for the purpose of engaging in devotional exercises, and casting themselves on the protection of God. This invitation was immediately embraced. The announcement that was made as to the religious denominations to which these clergymen belonged, appeared to have conciliated at once the confidence of all who were present. Word was carried up on deck, and from thence the rest of the passengers, accompanied by the captain, his officers, and crew, poured down in one body into the saloon, for the purpose of joining in the religious service proposed—a service for which every one appeared at that moment to be more thankful than another, not even excepting the foreigners, who knelt devoutly on the floor in the midst of their Protestant fellow-sufferers, and seemed to reckon it a

privilege to be allowed to mingle with them on such an occasion. There, in the presence of God and in the midst of pressing danger, all distinctions of creed were forgotten. The feelings of the various parties were too earnest and real to permit them to stand on such distinctions. There was only one man who held aloof, and who refused in a very marked way to approach the band of worshippers, and he was not a foreigner, but an Americanised Scotchman.

In the midst of deep silence one of the clergymen referred to began by reading the 107th Psalm—a Psalm which was felt to be singularly appropriate, and which called forth many a responsive sigh, and many a salt tear, from those who perceived how closely it applied to their own particular circumstances. It drew blood at the very first stroke; for in that strangely mixed audience there were not a few homeless and friendless wanderers, who had been tossed about the world, and who were yet roaming from one country to another without finding any settled resting-place. One can easily conceive the feelings with which they must have listened to the Psalmist's description of their own case as it was then read in their hearing:—

“They wandered in the wilderness in a solitary way: they found no city to dwell in. Hungry and thirsty, their soul fainted in them. Then they cried unto the Lord in their trouble,” &c.

There were there also, no doubt, some thoughtless prodigals, driven by their vices from home and kindred, and now reaping the fruit of their folly in the shape of “cold neglect and penury and scorn.” How keenly would these words have struck upon their hearts at that solemn moment:—

“Fools because of their transgression, and because of their iniquities, are afflicted. Their soul abhorreth all manner of meat; and they draw near unto the gates of death. Then they cry unto the Lord in their trouble,” &c.

This passage was followed by audible groans from different parts of the saloon, and several men threw themselves prostrate on the floor, as if overwhelmed with sorrow or shame. But the passage which comes immediately after it, and which describes so vividly, what had been so fearfully realised by every one on board in the course of that awful night, was accompanied by a general burst of emotion, which, at last, gradually swelled out into something like an absolute wail:—

“They that go down to the sea in ships, that do business in great waters: these see the works of the Lord, and His wonders in the deep. For He commandeth and raiseth the stormy wind, which lifteth up the waves thereof. They mount up to the heaven, they go down again to the depths: their soul is melted because of trouble. They reel to and fro, and stagger like a drunken man, and are at their wit's end. Then they cry unto the Lord in their trouble,” &c.

As soon as this most impressive lesson was ended the other clergyman engaged in prayer, which he did in a quiet and solemn tone, evidently intended to calm the agitation of the audience, and to give a more subdued and devotional turn to their too-strongly excited minds. If this was his object he was entirely successful, for those outbursts of natural feeling which had, to some extent, interrupted the reading of the chapter, became gradually less violent, until at last a spirit of deep stillness settled down on the kneeling throng. In the midst of that solemn hush every syllable was heard with the most perfect distinctness. Save the occasional rush of the blast above, and the murmuring sound of the receding waves, there was not a whisper to break the dumb silence that now reigned all over the ship. Every soul there present seemed as if wrapped and absorbed in the exercise of prayer. They held in their breath

lest a word should be lost ; nor was there. Every sentence fell upon the hearts of the worshippers with a soothing and healing, and, let us hope, a hallowing influence. As afterwards described by an eminent minister,* who was kneeling there among the rest, “it was like oil upon the troubled waters;” and the effect of the whole service in stilling the fearful agitation which had prevailed, more or less ever since the vessel had struck, was perfectly wonderful. While it was going on the ship settled and ceased to move. The wind also, and the sea, went down perceptibly. At the very time that we were crying to the Lord, “He made the storm a calm, so that the waves thereof were still.” The congregation rose up from their knees evidently and deeply solemnised, retired quietly to their cabins, and waited there peacefully and patiently till the morning light came, when we were all safely landed on the sandy beach of Dundrum.

W. M'G.

DIVINE THOUGHTS IN THE FACTS OF CREATION.

THE Distribution of Heat, an idea, as well as a fact.

The sun is the great fountain of heat as of light, and the amount of heat received by the earth is determined, first by its proximity to the sun, and secondly by the line of descent of the heat from the sun to the earth, according as that is more or less direct or slanting.

The path of the earth around the sun is so nearly circular, that there could be no very perceptible difference of heat at one time of the year compared with another,

* The Rev. Dr. Cox, of Brooklyn.

arising from its greater or less proximity. So much is this the case, that although the earth is actually at one period nearer to the sun, *that* is not the warmest but the coldest season of the year. It is the line of descent of the heat from the sun, therefore, which chiefly determines the amount which any part of the earth receives. The path of the earth and its inclination on its own axis secure that the sun's rays shall fall directly on the surface between twenty-three degrees north and twenty-three degrees south of the Equator. These tropical regions, therefore, enjoy a perpetual summer, to which the constitution of their population, rational and irrational, is adapted, and which is connected also with a richness and exuberance of vegetable life, unknown in other climates. To us, it is the height of summer when the sun pours his direct rays on the farthest limit which they reach north of the Equator; and the depth of our winter, on the contrary, is when these rays fall on the farthest limit which they reach south of the Equator. Between the winter and the summer is our spring, between the summer and the winter is our autumn, at both of which seasons the sun's direct rays fall on the Equator.

By this economy, an immense proportion of the earth's population enjoys a temperate climate and a genial and productive soil. What extremes there are of heat and cold are accompanied with this modifying advantage, that they are permanent; so that vegetable and animal organisations are disciplined and inured, and are as much adapted to them as the inhabitants of more temperate regions are to their location. This advantage has an universal bearing. The fixedness of the revolution of the seasons is owing to the fixedness of the earth's axis and of its inclination. Why is not the summer of one year the winter of another? Why is not one year an entire winter and another an entire summer? These questions touch the very possibility of

animal and vegetable existence on the earth, and they resolve themselves into another,—Why are the earth's axis and inclination not changeable instead of being permanent? Such *is* the order of the universe. But it might have been endlessly different. Those who are versed in the doctrine of probabilities could tell us, that there are we know not how many chances to one against the existing order. But it is established and secured, nevertheless,—it is a fixed and immoveable *idea*,—*the* Divine idea unfailingly uttered and embodied.

The tropical regions of the earth receive the directest and largest supply of heat. But the tendency of this element, as indeed of everything in nature, is to equilibrium. Heat is universally diffusive and sends out its influences in all directions, in order to produce an uniform and equable condition. On this ground it is conceived and partly established, that an internal circulation is constantly carried on between the warmer and the colder portions of the earth's surface. The heat which falls upon the torrid zone penetrates deeper and deeper; each month, each week, each day, augments the amount accumulated, and sends it so much lower into the interior. But this accumulation does not lie stagnant beneath the surface. On the contrary, the heat expands and flows north and south towards the poles, and tends to equalise the temperature of the whole globe.*

Besides this internal circulation, there is a manifest and most genial external circulation from the Equator to the Poles, and from the Poles to the Equator. It may be mentioned, in connexion with the chemical phenomena of the atmosphere, that it is almost a non-conductor of heat. The sun's rays descending through it are, to a very inconsiderable extent, absorbed by it, and the heat of the atmosphere of which we speak is not directly communicated

* Whewell's "Astronomy and General Physics," Bk. I. Ch. 8.

from the sun, but is reflected from the earth. The quantity is immense, which is in this way reflected from the earth and absorbed by the atmosphere. Over the torrid zone there might thus, therefore, hang permanently a scorching temperature, and over the frozen zones an atmosphere of ice. But instead of this, between these two extremes there is a constant action and re-action. The heated air of the tropics, specifically light, rising upward, flows through the upper atmosphere in two continuous streams, one towards the south and another towards the north pole. On the contrary, the cold air of the polar regions, specifically heavy, flows along the surface of the earth in two opposite and powerful currents, one from the south and another from the north, towards the Equator. Hence throughout the northern hemisphere, and during a great part of the year, there is a prevailing wind, modified and altered by local and temporary causes, *from* the north, while in the higher regions of the atmosphere the current is as powerfully *to* the north. Exactly the opposite of this, of course, is observed in the southern hemisphere. The effect of this economy, it can readily be understood, is to modify the extremes of heat and cold over the globe. To the same result, also, the diurnal motion of the earth on its axis materially contributes. That motion is from west to east, but it necessarily varies in velocity, as the circumference widens or narrows. At the Poles the motion is inconsiderable, at the Equator it may be taken at the rate of a thousand miles an hour, and from the Poles to the Equator it of course increases proportionally with the span of the circumference till it reaches the maximum which has been named. This rotation from west to east must create a powerful resisting current from east to west all over the earth, which will modify according to circumstances, and draw to various points of the compass

the winds from the north and south. An additional circumstance must be taken into the account. The earth in its rotatory movement carries its atmosphere, forty-five miles in height, along with it, but not always with uniform velocity. If the motion of the atmosphere were perfectly uniform with that of the earth, the current from east to west would be completely neutralised on the surface. Near the tropical regions, where the width of the circumference perceptibly increases, and where also begins the disturbing effect of excessive heat, the atmosphere is left behind the earth in its rotation. There, accordingly, the currents from the east are so powerful as completely to neutralise those which have been already named as flowing from the Poles. For a great part of the year, therefore, these currents, called trade winds, uniformly in one direction, steadily prevail. But from the Tropics to the Equator, the superincumbent atmosphere is regaining its motion, and at last acquires the same velocity as the earth. The easterly currents are thus variously deflected by the force of those from the Poles till toward, and at, the Equator they are completely neutralised, and the powerful winds are from the Poles, as steadily as if the earth were at rest.*

The science of Meteorology deals with the climate of the globe, with the alternations of cold and heat, and with the phenomena of winds. The sphere is necessarily subject to endless and minute disturbances, arising from local and temporary causes, of which it is impossible to take exact account. But here, as everywhere, Thought reigns,—Thought to which there can be no contingency, and by which the minutest changes are calculated and provided for.

QUÆRENS.

* Prout's "Bridgewater Treatise," pp. 253-7. Daniell's "Meteorological Essays."

OURSELVES.

NUTRITION (*continued*).

THE ABSORBENTS.

It will be necessary to go a little out of our direct road (which would lead us, at once, to trace the chyle into the circulation), that the reader may become acquainted with a system of vessels called *Absorbents*, by which very curious and important duties are fulfilled in the animal economy. They are small, extremely delicate, and almost transparent tubes,* which exist in almost every part of the body, with the exception of the brain, the spinal marrow and their immediate coverings, the eye and ear, the hair and the nails. When filled with fluid they have rather a knotted appearance; which is caused by a succession of valves, placed, at irregular intervals, in their interior; and which only open in one direction. Every now and then, the course of the vessels is, apparently, interrupted by the occurrence of small reddish-grey bodies, either isolated or in groups, varying in size from the 20th to the 4th of an inch. These are technically termed *Absorbent glands*.

Anatomists distinguish the absorbents into two sets,—*Lacteals* and *Lymphatics*. The distinction is made, not from any known difference in their structure, or mode of discharging their duties, but rather from a difference in the duties they respectively fulfil. By the *Lacteals*, the chyle, in a milk-like condition, is conveyed into the blood. They are thus channels for renovation and supply. On

* If an animal (a sheep or rabbit, for instance) is killed about three hours after eating, the vessels can be readily seen distended with chyle. In order "to demonstrate them," they are commonly injected with mercury, which assumes the appearance of a fine metallic wire.

the other hand, the Lymphatics are chiefly employed in absorbing and removing, into the circulation, in the form of *Lymph*, all redundant fluids, and the melted materials of the various structures of the body which are continually undergoing renewal and repair.* The *Lymphatics* constitute about one-third of the absorbent vessels, and are distributed through the whole body (with the exceptions already mentioned). Their origin appears to be in the fine web-like membrane by which the different structures of the fabric are tied together, and packed: but they are also found in great numbers in the external integuments; in the lining membranes of the different cavities; in the mouth and fauces; and in the viscera of the chest and abdomen.

Beside the duties which the Lymphatics ordinarily fulfil when the body is in a state of health,—the removal, for the renewal of the serum and mucus which moisten, and the oily materials which lubricate the different surfaces; the halitus of the various cavities; the solids, both of bone and flesh, of which there is a constant renovation going on; the fat, as it may be required for occasional use—but they also subserve very important purposes when diseases arise. All processes of ulceration for the discharge of foreign substances, and for the relief of enclosed matter: all evacuations of redundant fluids in different forms of dropsy; the removal of tumours and tumefactions, occurring naturally or induced by medicated stimulants: these and many other such services are transacted by them. As are also the reception and introduction into the system of those drugs, which, though ap-

* It would be unjust to the memory of two great men, not to mention, even in so cursory a notice as this, that we are principally indebted to William and John Hunter, both most eminent anatomists and physiologists, for our knowledge of the structure and economy of the absorbent system. Before their time, the function of absorption, as far as it was understood, was supposed to be carried on by the veins.

plied externally (as mercury and iodine), act on the body generally.

So delicate is the texture of the *Lacteals*, and so very minute are their extreme ends—the immediate points of interseption—that it is still undetermined, whether they imbibe the chyle, directly, by open mouths from the inner surface of the intestines ; whether it is first sponged up by the Villi (already noticed, in the paper on the alimentary canal) in which they seem to originate ; or whether it is filtered into them, through an intervening layer of membrane.

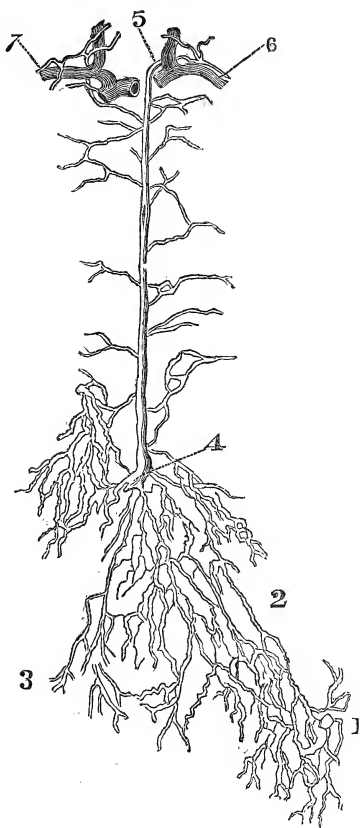
Be that as it may, the radicle tubuli soon unite and form conspicuous trunks. These after wandering, more or less, between the coats of the intestines, pass into the Mesentery. In their course through it, they become intimately connected with the *Mesenteric glands*, of which there are about a hundred groups. Though they ramify in them, and are seemingly interwoven with the intimate texture of the glands, they do not lose their continuity ; for an uninterrupted channel can generally be made out. From them they proceed on to a common reservoir, called the *receptaculum chyli*, the receptacle of the chyle, which lies immediately in front of the third vertebra of the loins. Towards this little reservoir all the lacteals converge, and into it they all empty their contents. It also receives the lymph, collected by the lymphatics, from the inferior extremities and the lower portions of the body.

Though designated by a special name, the receptacle is hardly more than a slight dilatation of the *Thoracic duct*, which arises from it, and of which it forms a part.

This most important vessel* is about the size of a crow's quill. Like the smaller tubes it is almost transparent, very

* It is very remarkable that this little tube, the integrity of which is so essential to life, is rarely, if ever, found in a diseased state.

delicate, and is furnished with valves. Passing upwards from the reservoir, it ascends, directly in front of the backbone, through the chest, a little higher than to the top of the breast-bone; then, bending downwards and inwards, it



penetrates a vein under the collar-bone, called the *subclavian vein*.

Two little valves, placed at the entrance, allow the chyle to pass from it into the vein, but effectually hinder the blood, which is circulating in the vein, from intruding into it. In its upward course it admits many tributaries, which convey lymph into it from the trunk of the body, and from the viscera, generally. The Lymphatics of the left arm, and the left side of the head, end also in it: while those from the right side of the head and face, and from the right arm, from the right lung and part of the liver, terminate in a corresponding vein on the right side,

having previously united into one common trunk.

In the annexed little sketch, the figures 1, 2, 3, indicate the Lacteals and Lymphatics which arise from the intestinal canal, and the abdominal viscera; 4, the receptacle of the chyle; from it to 5, is the thoracic duct. No. 5 also shows where it enters the vein. 6, the subclavian vein. 7, the vein on the right side, which receives the Lymphatics from the right side of the face, &c. The tributaries which terminate in the thoracic duct are also shown, but not marked by numbers. As no muscular fibres have been found in the coats of the absorbent vessels, the motion of the chyle and lymph in them is referred to the movements of the muscles when the limbs and the body are in motion; to a "vis a tergo," an energy from behind; but chiefly to the "sucking power of the heart," by which the blood in the veins, and the fluid in the thoracic duct, and its branches, are drawn to it, as to a common centre.

It will readily occur to the reader, that the contents of the thoracic duct must be of a very mixed character—consisting of chyle deduced from all sorts of food, and of lymph abstracted from such a variety of sources; and that its introduction into the blood requires great circumspection, that it may neither be suddenly surcharged with redundant nutriment, nor loaded with noxious materials. This has been guarded against in two ways.

P. S.

THE CLOUD.

“A little Cloud.”—1 *Kings*, xviii. 44.

A LITTLE Cloud was fashioned
In a summer hour
By the love impassioned
Of the sun and shower.
All day it basked in sunlight
On the heaven's warm blue,
Round lilies through the dun night
It hung in dew.

Once when dawn was leading
In the hot young day,
This little Cloud speeding
Through the ether grey,
Seemed to float and sail
On the bright sky's bosom,
Like a dew-drop pale
On a blue-bell blossom ;

So close under heaven
Did it glide and fleet,
That I thought it riven
By some angel's feet,
When the breezes parted
Its veiling screen,
And blue glimpses darted
Into sight between.

As I gazed came breathings
On a zephyr's wings,
As of wild wind-wreathings
Round Eolian strings.

'T was a lark far hidden
In the little cloud,
"Singing songs unbidden,"
Full, and free, and loud.

Oh, it came down-streaming
The clear air along,
Like rills roused from dreaming,
Like a shower of song.
It made me glad and bright,
Brighter every minute,
Till I blessed the cloudlet white,
And the spirit in it.

Then the sun's noon-splendour
Filled the cloud with light,
Though a soft and tender
Yet intensest white ;
And the wanderer weary
Joyed that it was made,
For it gave to him a cheery
And a grateful shade.

Did the semblance of a shadow
On the wide sky pass ?
It dusked the quiet meadow,
And the glistening grass ;
It dimmed the forest fountain
And the clover lea ;
It deepened on the mountain,
Darkened on the sea.

Still though Earth was shaded,
And a gloom was there,

Never dulled or faded
Was the cloudlet fair ;
For it ever sailed
Up so close to heaven,
That nothing could have failed
Of the beauty given.

Now a lustre glowing
In the silent west,
From the sun was flowing
As he turned to rest ;
And the Cloud borne sunward
Ever nearer, nigher,
Ever floated onward
Toward the sunset-fire ;

All its being belted
With a glory bright,
While into heaven it melted
In a dream of light.
Never more glance crossed it
In the sky-heart far,
But where I had lost it
Shone the evening star.

—It is gone, but a lesson
To you and to me
Comes with an impression
Of what life should be.
Sweetly it has taught us ;
May our lives, dear child,
With the image it has brought us
Be reconciled.

Like the cloud keep union
 With the pure and high,
 Be thy communion
 Beyond the sky ;
 So all love and graces,
 And a light divine
 Shall have pleasant places
 In that heart of thine ;

And from thee will shower
 Upon all around
 A most precious dower,
 Like the shade and sound :—
 Like the music-blessing
 Of lark's ziralet,
 Like the shadow's refreshing
 In the summer heat.

If trouble and sadness
 Be around, above,
 Thou wilt drink deep gladness
 From thy Heaven of love ;
 As when earth was covered
 With a twilight shroud,
 Richer radiance hovered
 Round the little cloud.

And when life is ending,
 Oh, how dear to die
 Like the cloudlet, blending
 With the glorious sky !
 And when un beholden,
 As its beauties are,
 To have memories, golden
 As the lovely star !

REVIEW OF THE MONTH.

ONE of the contributors to our pages was Mr. C. M. Charles, whose initials will be recognised in connexion with the series on English Letter-writers. At the early age of thirty, and after a brief illness, on the 31st of July last, he was, by the hand of death, removed from a pleasant home, which cold look or cross word had never saddened, and from a circle of friends whom each successive year attached more closely. Business was Mr. Charles's profession, but literature was his favourite pursuit. He possessed in an uncommon degree that faculty of poetic engineering which Southey claimed for himself, and it was his great delight to plan fictitious narratives. Many of these he wrote fully out, and some of them having been published have found favour with the public: for example, "Claverston," and "Arvon, or The Trials." Latterly he had been turning his attention to critical biography, and an essay on "Alfieri," published early in the summer, is admirable for the sprightliness of its narrative and the vigour of its translations. Knowing him so intimately as we did, we have seldom seen "diligence in business" so well combined with intellectual tastes and the culture of the social affections. His delight was in books and living friends; and whatever might be the seductions of "the unrighteous Mammon," nothing could prevent his timely return to his own homestead, and to the society of his favourite authors. And if, instead of prosperity, it had pleased Providence to try him with reverses, rather than forego mental pleasures and home-felt joys, we believe that he would have endeavoured to reconcile himself and those around him to the humblest fare in the obscurest dwelling. The conse-

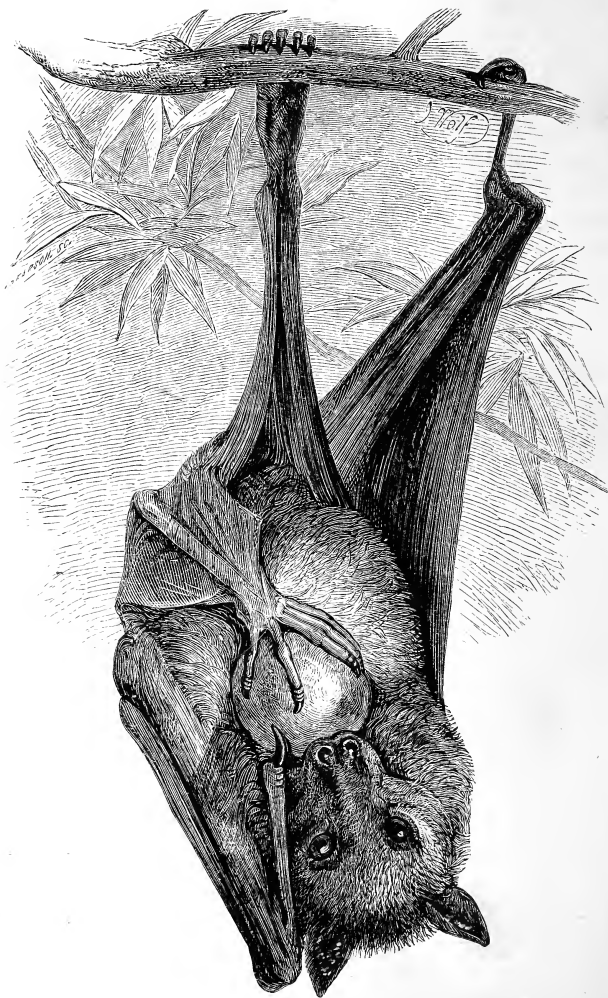
quence was, his heart was evergreen and his literary treasures were a fountain of instruction ever fresh and flowing. Was he not right? Is there no such thing as temperance in money-making? Must a man of business be a galley-slave, and know no other end in living, but the adding of penny to penny and pound to pound? Must he coin all his strength and soul, all his heart and mind, into the imperial currency; and instead of love, wisdom, gladness, must he night after night bring home more cash, more cheques and change? Would not many wives and daughters gladly accept an additional hour of a husband's or a father's society in preference to the fashionable mansion, or the expensive dress or jewel? And to many children would it not be a better legacy, the hallowing example and endearing influence of parental converse, than a mere bequest of sovereigns and consols from a piece of money-making mechanism? The career of our departed friend was singularly happy and serene. In the light of the cross he had learned the love of God, and he seemed to expect nothing but good at the hand of his heavenly Father. And in the recollection of those numerous friends whom he attached by his charming cordiality and obliging offices his memory will long be cherished with peculiar tenderness.

Dr. Buckland died at Clapham on the 14th of August, in his seventy-third year. He had held the office of Reader in Mineralogy and Geology in the University of Oxford for forty years; and it would be hard to say whether his vivid and amusing lectures or the romantic volumes of Sir Charles Lyell have gone the farthest to render Geology the most popular of the sciences in England. His "Bridgewater Treatise" gives a good idea of these lectures, with their cheery tone and happy illustrations. It is affecting to know that the last years of this fine intellect were passed under

almost total eclipse. In 1845, Dr. Buckland was preferred to the Deanery of Westminster.

From the Mineral Statistics of 1855, compiled with vast labour by Mr. Hunt, we gather the following facts as to the mineral produce of the British Isles last year. The quantity of tin raised was 8947 tons, and, at the average price of 68*l.* per ton, its value was 608,396*l.* Of copper (including, however, foreign purchases), there were 26,078 tons, realising 2,867,207*l.* Of pig-lead there were produced 73,091 tons, at a market price of 1,311,971*l.*; and of silver 561,906 ounces, worth 140,476*l.* Of iron ore there were raised 9,553,741 tons, yielding 3,218,154 tons of pig-iron, worth 13,516,266*l.* Of coals, Durham and Northumberland yielded 15,431,400 tons; Yorkshire, 7,747,470; Derbyshire and Nottinghamshire, 3,065,400 tons; Lancashire, 8,950,000 tons; Scotland, 7,325,000 tons; South Wales, 7,552,770 tons.

Seldom has there come into our hands a volume so suggestive of thought, and so replete with sanctified wisdom, as "Eclectic Notes," written by the Rev. Josiah Pratt, and published by his son. The Eclectic Society of London was a clerical club consisting of such men as Scott, Cecil, Newton, Basil Woodd, Daniel Wilson, Simeon, Goode, J. Venn, which used to meet once a fortnight to discuss theological and practical questions. During the sixteen years of his attendance, Mr. Pratt took the Notes, now published, and which contain the ripe results and brotherly communings of so many holy and gifted minds. The perusal of this remarkable volume, besides the direct instruction and quickening it is fitted to impart, will, doubtless, incite ministers of kindred sentiment, and within a convenient distance of one another, to go and do likewise.



Flying Fox. (*Pteropus ruficollis*.)

FOX-BATS (*Pteropus*).

IN this country that bat is deemed a large one whose wings, when measured from tip to tip, exceed twelve inches, or whose body is above that of a small mouse in bulk. In some parts of the world, however, there are members of this well-marked family, the wings of which, when stretched and measured from one extremity to the other, are five feet and upwards in extent, and their bodies large in proportion. These are the Fox-bats, a pair of which were lately procured for the Zoological Gardens. It is from one of this pair that the very characteristic figure of Mr. Wolf has been derived. There is something very odd in the appearance of such an animal, suspended as it is during the day head downwards, in a position the very sight of which suggests to the looker-on ideas of nightmare and apoplexy. As the head peers out from the membrane, contracted about the body and investing it as in a bag, and the strange creature chews a piece of apple presented by its keeper, the least curious observer must be struck with the peculiarity of the position, and cannot fail to admire the velvety softness and great elasticity of the membrane which forms its wings. It must have been from an exaggerated account of the Fox-bats of the Eastern Islands that the ancients derived their ideas of the dreaded Harpies, those fabulous winged monsters sent out by the relentless Juno, and whose names are synonymous with rapine and cruelty.

Some of these bats, before they were thoroughly known, frightened British sailors not a little when they met with them. Captain Cook, in the narrative of his first voyage, alludes to this; one of the seamen of the Endeavour, when that ship lay off the Australian coast in 1770, during his

rambles in the woods, told his messmates on his return that he verily believed he had seen the devil: "We naturally inquired in what form he had appeared, and his answer was in so singular a style that I shall set down his own words: 'He was,' says John, 'as large as a one-gallon keg, and very like it; he had horns and wings, and yet he crept so slowly through the grass, that if I had not been *afeard* I might have touched him.'" Cook's party afterwards encountered this prodigy, which turned out to be a large bat, as big as a partridge and nearly black in colour. The ears of the Fox-bat could readily convert themselves into horns to the superstitious eye of one who fancied he saw Satan, as many artists have figured that minister of evil.

Dr. Forster, who accompanied Captain Cook on the voyage round the world from 1772 to 1775, observed Fox-bats at the Friendly Islands, where they were seen in large groups of hundreds. Our traveller even notices that some of them flew about the whole day, doubtless from being disturbed by the wandering crews of the British discovery ships. He saw a Casuarina tree of large size, the branches of which were festooned with at least five hundred of these pendent Cheiroptera in various attitudes of ease, according to the habits and notions of the bat tribes, who can hang either by the hind or by the fore-feet. He noticed that they skimmed over the water with wonderful facility, and he saw one in the act of swimming, though he cannot say that it did so with either ease or expertness; they are known, however, to frequent the water in order to wash themselves from any impurities on their fur or wings, as well as to get rid of the vermin which may be infesting them.

Captain Lort Stokes found the red-necked species to be very abundant, during his survey of the north coast of Australia in H.M.S. Beagle. As the boats were engaged in the survey, flights of these bats kept hovering over them,

uttering a disagreeable screeching noise and filling the air with a faint mildewy odour, far from agreeable to the smell. The sailors gave these bats the name of “monkey-birds,” without being aware that naturalists in their systems consider them as following closely the order which contains these four-handed lovers of trees. Captain Stokes observes that the leathern wings have a singular heavy flap, and that a flight of bats would suddenly alight on a bamboo and bend it to the ground with their weight. Each individual struggles on alighting to settle on the same spot, and like rooks or men in similar circumstances, they do not succeed in fixing themselves without making a great deal of noise. When first they clung to the bamboo, they did so by means of the claw on the outer edge of the flying membrane, and then they gradually settled.

Among the wild and varied scenery of those groupes of islands called the Friendly Islands, the Feejees, and the Navigators, a species of Fox-bat form one of the characteristics of the place to the observant eye; while, if the traveller should happen to be blind, their presence among the otherwise fragrant forests would be readily perceived from the strong odour which taints the atmosphere, and which, says the Naturalist of the United States Exploring Expedition, “will always be remembered by persons who have visited the regions inhabited by these animals.” Mr. Titian Peale mentions that a specimen of the Fox-bat was kept in Philadelphia for several years; and like most creatures, winged as well as wingless, was amiable to those persons who were constantly near it, while it showed clearly and unmistakably its dislike to strangers.

On its voyage, this strange passenger was fed on boiled rice, sweetened with sugar; while at the Museum, it was solaced and fed during its captivity chiefly on fruit, and now and then appeared to enjoy the picking from the bones of a

boiled fowl. The fox-bat is but seldom brought alive to this country. The late Mr. Cross of the Surrey Zoological Gardens, kept one for a short time, and deemed it one of his greatest rarities; and till the arrival lately of the pair alluded to at the gardens in the Regent's Park, we have not heard of other specimens having been exhibited in this country. They are difficult to keep, and seem to feel very sensibly the changes of our climate, while it is a hard thing to get for them the food on which they live when in a state of liberty.

Mr. Macgillivray discovered a new species of fox-bat on Fitzroy Island, off the coast of Australia, when he was naturalist of H.M.S. Rattlesnake.* He fell in with this large fruit-eating bat (*Pteropus conspicillatus*) on the wooded slope of a hill. They were in prodigious numbers, and presented the appearance, as they flew along in the bright sunshine, of a large flock of rooks. As they were approached, a strong musky odour became apparent, and a loud incessant chattering was heard. He describes the branches of some of the trees as bending beneath the loads of bats which clung to them. Some of these were in a state of inactivity, sleeping or composing themselves to sleep, while many specimens scrambled along among the boughs and took to flight on being disturbed. He shot several specimens, three or four at a time, as they hung in clusters. Unless they were killed outright, they continued suspended for some time; when wounded, they are difficult to handle, as they bite severely, and at such times their cry resembles somewhat the squalling of a child. The flesh of these bats is described to be excellent, and no wonder, when they feed on the sweetest fruits; the natives regard it as nutritious food, and travellers in Australia, like the adventurous Leichhardt on his journey to Port Essington, sometimes are

* "Narrative of the Voyage," i. p. 96 (1852).

furnished with a welcome meal from the fruit-eating Fox-bats which fall in their way.

Travellers observe that in a state of nature the Fox-bats only eat the ripest and the best fruit, and in their search for it they climb with great facility along the under side of the branches. In Java, as Dr. Horsfield observes, these creatures, from their numbers and fruit-eating propensities, occasion incalculable mischief, as they attack every kind that grows there, from the cocoa-nut to the rarer and more delicate productions, which are cultivated with care in the gardens of princes and persons of rank. The Doctor observes, that "delicate fruits, as they approach to maturity, are ingeniously secured by means of a loose net or basket, skilfully constructed of split bamboo. Without this precaution little valuable fruit would escape the ravages of the kalong."

We have mentioned that the Fox-bats are occasionally eaten in Australia. Colonel Sykes alludes to the native Portuguese in Western India eating the flesh of another species of *Pteropus*; and it would seem that but for prejudice, their flesh, like that of the young of the South American monkeys, is extremely delicate; the Colonel says, writing of the *Pteropus medius*, a species found in India, "I can personally testify that their flesh is delicate and without disagreeable flavour."

The Javanese Fox-bat occasionally affords amusement to the colonists as well as natives, who chase it, according to Dr. Horsfield, "during the moonlight nights, which, in the latitude of Java, are uncommonly serene. He is watched in his descent to the fruit-trees, and a discharge of small shot readily brings him to the ground. By this means I frequently obtained four or five individuals in the course of an hour." The natives of New Caledonia, according to Dr. Forster, use the hair of these great bats in ropes, and in

the tassels to their clubs, while they interweave the hair among the threads of the *Cyperus squarrosus*, a grassy-looking plant which they employ for that purpose.

William Dampier,* in 1687, observed the habits of a Fox-bat on one of the Philippine Islands, though he has exaggerated its size, when he judged "that the wings stretch out in length, could not be less asunder than seven or eight foot from tip to tip." He records that "in the evening, as soon as the sun was set, these creatures would begin to take their flight from this island in swarms like bees, directing their flight over to the main island. Thus we should see them rising up from the island till night hindered our sight; and in the morning, as soon as it was light, we should see them returning again like a cloud to the small island till sunrising. This course they kept constantly while we lay here, affording us every morning and evening an hour's diversion in gazing at them and talking about them." Dr. Horsfield describes the species, which is abundant in the lower parts of Java, as having the same habit. During the day it retreats to the branches of a tree of the genus *Ficus*, where it passes the greater portion of the day in sleep, "hanging motionless, ranged in succession, and often in close contact, they have little resemblance to living beings, and by a person not accustomed to their economy, are readily mistaken for a part of the tree, or for a fruit of uncommon size suspended from its branches." The Doctor describes their society as being generally silent during the day, except when a contention arises among them to get out of the influence of the sun, when they utter a sharp piercing shriek. Their claws are so sharp, and their attachment is consequently so strong, that they cannot readily leave their hold without the assistance of their wings, and if shot when in this position, they remain suspended. A. W.

* "New Voyage round the World" (1698), p. 381.

PIONEERS AND FIRST-FRUITS.

VAN DER KEMP AND THE HOTTENTOTS.

WHEN in 1650 the Dutch formed their settlement at the Cape of Good Hope, they found the country already in the possession of a curious little people. Their complexion was by no means black, but a sort of sallow,—like a faded leaf, or yellowish-brown, as some authors describe it. With flat noses and oblate faces,—with long narrow eyes far apart from one another, and with little scrubby tufts of harsh curling hair scattered over their compressed, truncated heads, and their remarkably diminutive stature, their appearance was neither commanding nor prepossessing. They spoke a difficult and disagreeable language, full of clicking, guttural sounds; they kept flocks of sheep and herds of oxen, but they had no certain dwelling-place, migrating wherever the exigencies of pasture carried them: and, altogether, their physical and intellectual development was so low, that last century Edward Gibbon could speak of them as seemingly the connecting link between man and the inferior animals.

And, indeed, it was very much as inferior animals that the new settlers treated them. They were, for the most part, deprived of their cattle, and were compelled to tend the herds or drive the oxen of their conquerors. Many of the Dutch boers were intelligent and pious men; but there were few of them who did not share the prejudice against the poor Hottentots, and coarser natures treated them with haughty cruelty. As a Hottentot woman once said, “In the place where I was brought up, I wanted to listen to my master’s children when they read in the Bible, but was prevented. Some said, God created the Christians; but your

nation belongs to the race of baboons. God be praised that I now know that He has not only created us men, but that through mercy we may be saved through Jesus Christ."* The prejudice still lingers. It is not long since a missionary on his journey sought a night's shelter in the house of a Dutch farmer. He was received with the hospitality characteristic of their class; and before the household retired, the missionary proposed to have family prayer. The farmer assented, and bade his visitor proceed. However, the missionary said, "But will you not call in the servants?" "The servants! Do you mean the Hottentots? I suppose I had better call in the dogs!" Vexed as he was, the farmer called in the Hottentots, and the missionary read the story of the Syrophœnician stranger: "Then came she and worshipped him, saying, Lord, help me! But he answered and said, It is not meet to take the children's bread and cast it to dogs. And she said, Truth, Lord; yet the dogs eat of the crumbs which fall from their master's table." And the sequel gave him occasion to enlarge on the generosity and grace of the Lord Jesus. When, long afterwards, he passed that way again he found that a crumb from that evening's repast had proved the bread of life to a poor hungry soul. He was delighted to make the acquaintance of a well-instructed and warm-hearted woman of this outcast race, who had been brought to the knowledge of the Saviour by that exposition.

Although, as we have said, there were many pious persons among the Dutch, and, although they had amongst them some faithful ministers, it is not a little singular that no one seems ever to have turned his thoughts to these hapless heathen; and it was not till 1737, when their case so touched the heart of George Schmidt, a plain and unlettered Moravian, as to bring him out from Europe on purpose, that the

* "Missions in South Africa." Dublin, 1832.

Saviour was made known to this despised and ill-used people. Proceeding to Bavian's Kloof, or the Glen of Baboons, where they were at a safe distance from white men, this humble apostle opened his commission; and, although so many centuries had elapsed since the Master said, "Preach the Gospel to every creature," George Schmidt was probably the first who preached it to the Hottentots. God blessed his fervent labours. A settlement was formed, huts were erected, and growing numbers collected to the little village; a school was opened; a congregation of fifty people was organised; a few converts were baptized; and the little valley was often vocal with hymns in which the name of Jesus sweetly sounded. But after five years, having occasion to pay a visit to Holland, the missionary was not permitted to return; and it was fifty years before the Dutch authorities would allow any other to enter on the same field of labour.

John Theodore Van der Kemp was the son of a pious minister of the Dutch Reformed Church at Rotterdam, where he was born in the year 1748. As a student at Leyden, he was noted for his remarkable attainments; but, being of a stirring, active disposition, instead of following a learned profession, he entered the army. Here he continued for sixteen years, a dashing officer of dragoons, but unfortunately a profane and clever infidel, and the slave of vice and ungodliness. However, he married, and his character outwardly improved. He resolved to study medicine, and to perfect his acquirements he came to the famous school of Edinburgh. Thence he carried back to Middleburg, the sphere of his practice, a large store of science, and, in consequence of his intercourse with the deists of Edinburgh, an increased stock of infidelity. In his medical practice he adopted a curious rule. He would never admit to his list of patients more than twelve at a time; so that he

might be able to study each case fully, and devote his undivided attention to the cure.

At last, when he was upwards of forty years of age, he retired from active occupation, intending to devote the residue of his days to literary pursuits. Here, in his country-house near Dort, he thought a great deal on the subject of the soul and a future state. Christianity he rejected, as a collection of incoherent and irrational opinions; but for the person of Christ he had at first a prepossession. He thought that He was a man of sense and superior understanding, who, by opposing the ecclesiastical and political maxims of the Jews, had become the object of their hatred and the victim of his own system. However, when he again thought of Christ as claiming to be the Son of God, and professing to work miracles, he felt that he could no longer view Him with his former veneration.

“I then,” he says, “prayed that God would prepare me for virtue and happiness, by punishing my sins; and I thanked Him for every misfortune. But the first observation that I made was this,—that, though I was often severely chastised, it did not make me wiser or better. I therefore again prayed that in every instance God would show me the crime for which I was punished, that I might know and avoid it. Finding this vain, I began to fear that I should never be rightly reformed in this life by punishment; still I hoped that hereafter, in some sort of purgatory, I might be finally freed from moral evil. And yet when I reflected how little punishment had as yet done to produce the lowest degree of virtue in my soul, I was forced to allow that experience was opposed to my theory, and I concluded that it was quite beyond the reach of my reason to discover the true road to virtue and happiness. I confessed this to God, and owned that I was like a blind man, who had lost his way, and who waited in the hope that some benevolent

person would pass by and show him the right path. Thus I waited upon God, that He would take me by the hand and lead me in the way everlasting."

One day in the end of June 1791, and in this state of mind, he was sailing on the river near Dort with all his family,—that is, with his wife and only daughter,—when a sudden storm arose, and a waterspout bursting on the boat instantly capsized it. The doctor, clinging to the boat, was carried nearly a mile down the river; for in the fearful squall no one could venture out to render assistance. At last a vessel, which had been torn from her moorings, passed near him, and the sailors succeeded in getting him on board. When the tempest subsided and he reached the shore, he found himself, as he had feared, doubly bereaved, for he had no longer wife nor daughter.

Just as a sudden shock sometimes sobers a drunkard, so it sometimes sobers an infidel. The besotted conscience wakes, and before sophistry has time to close the shutters, some beams of truth have darted in. Van der Kemp had been on the brink of eternity, or rather he had already been over the verge: a mighty hand had intercepted him, and restored him to the land of the living. But it was no longer the same world. His home was desolate, and the earth was dark. Next Sabbath he went to church, and was much impressed by the observance of the Lord's Supper, which that day happened to be celebrated, and of which he could not refrain from partaking, notwithstanding his hitherto avowed unbelief. In much agitation he placed himself among the communicants. He felt broken-hearted, and yet constrained to acquiesce in the sovereign will of God, which had in a moment deprived him of his dearest earthly comforts. He also felt powerfully disposed to yield himself to God through Jesus Christ; and when he thought of his rejection of the Christian system, it was impressed on his mind,—“Examine it once more, and you will judge dif-

ferently ; but eat now of this bread, and remember your new Master." In the afternoon he sat down, and with such composure as he could command, he began to ponder the leading doctrines of the Gospel,—more especially those which relate to the disobedience of Adam and the righteousness of Christ. According to his apprehension the New Testament account of the matter is shortly this : that the sinner is a likeness of Adam the guilty and condemned ; but that through the grace of God and the intervention of God's Son, that sinner is restored to the image of the holy and glorified Redeemer, the second Adam. He then proceeded to search the Scriptures, and was amazed to find the whole truth so luminously set forth in the Epistle to the Romans. It satisfied his judgment, it overpowered his feelings, and thenceforward he received and revered the sacred Scriptures as the Word of God, and made them his rule of faith and practice. He was a converted man.

In his own words,—“When the Lord Jesus first revealed himself to me, he did not reason with me about truth and error, but attacked me like a warrior, and felled me to the ground by the power of His arm. He even displayed no more of the majesty of a benevolent king than was necessary to compel me willingly to obey Him. But as soon as I had submitted to Him as a conqueror, He assumed the character of a prophet, and I then perceived that the chief object of His doctrine was to demonstrate the justice of God, both in condemning and saving the children of men. I was pleased to find that it had been represented to Paul in the same light, when he admired and adored. It is the justice or righteousness of God therein so evidently revealed which excites faith and conviction in the hearer.”*

At this time missions were a novelty, and no missionary

* “Memoir of Van der Kemp,” a pamphlet published at London, 1812.

movement had yet proceeded from the Netherlands. But the perusal of one of the documents of the London Missionary Society produced such an impression on the mind of Dr. Van der Kemp, that he made an offer of his services to that Society. They were delighted to obtain a man of his power and fervour, and as in the Providence of God he appeared exactly the man they needed for their projected mission to South Africa, to which his own thoughts had been peculiarly directed, he was at once designated to the work along with Mr. Kicherer and others. Their ordination took place in the Scots' Church, Crown Court, in the end of 1798.

Like all successful evangelists, Dr. V. was a man of extraordinary energy. He was fifty years of age before he set sail for South Africa; but, full of Christian elasticity, and enthusiastically devoted to the race whose welfare he sought, he shrank from no danger, and toil and hardship he rather seemed to invite. During his sojourn in London, passing a brick-field it struck him that a great boon might be conferred on the Hottentots by teaching them to build better houses, in order to which it would first be needful to teach them the art of brick-making. Accordingly he sought leave to join the labourers, and for some weeks the venerable apprentice sweltered among the brick-kilns, lightening his labour by the thought of Africa. And when he arrived among the people of his choice, he consecrated himself to their service with the ardour of a lover and the zeal of an apostle. Undismayed by their offensive habits, he took up his abode in the midst of them, and often without any European comfort,—sometimes without hat, or shoes, or stockings,—he not only taught their children and preached to them the Gospel, but, “labouring with his own hands,” he showed them how by their own industry they might support themselves; and, as if in defiance of the prejudices of his Dutch compatriots, he threw in his lot entirely with

these scorned outcasts by taking a Hottentot woman for his wife. He "was a man of exalted genius and learning. He had mingled with courtiers. He had been an alumnus of the Universities of Leyden and Edinburgh. He had obtained plaudits for his remarkable progress in literature, in philosophy, divinity, physic, and the military art. He was not only a profound student in ancient languages, but in many of the modern European tongues, even to that of the Highlanders of Scotland, and had distinguished himself in the armies of his earthly sovereign. Yet, this man, constrained by the 'love of Christ,' could cheerfully lay aside all his honours, mingle with savages, bear their sneers and contumely, condescend to serve the meanest of his troublesome guests, take the axe, the sickle, the spade, and the mattock, lie down on the place where dogs repose, and spend nights with his couch drenched with rain, the cold wind bringing his fragile house about his ears. Though annoyed by the nightly visits of hungry hyenas, though compelled to wander about in quest of lost cattle, and exposed to the caprice of those whose characters were stains on human nature, whisperings occasionally reaching his ears that murderous plans were in progress for his destruction, he calmly proceeded with his benevolent efforts; and to secure his object would stoop with 'the meekness of wisdom' to please and propitiate those rude and wayward children of the desert whom he sought to bless."*

When the labours of the Doctor and his colleagues were beginning to tell on the Hottentots, the Dutch farmers took alarm. They feared that with the progress of instruction they would lose the services of these poor savages, whom they had hitherto treated very much as beasts of burden; and their representations were producing such an effect on the respectable Dutch governor, Janssen, that he imposed very inconvenient restrictions on the operations of the mission.

* Moffat's "Southern Africa," p. 28.

Fortunately, at this period (1806) the colony passed into the hands of the English ; and under the protection of Sir David Baird, the mission so prospered, that, in 1810, the settlement at Bethelsdorp contained nearly a thousand inhabitants, all receiving Christian instruction. Mats and baskets were made in considerable quantities, and sold in the surrounding country. Salt was also manufactured, and bartered for wheat ; and by sawing, soap-boiling, and woodcutting, the people exerted themselves for an independent maintenance. Dr. V., who supported himself as a missionary with scarcely any charge to the Society, spent nearly a thousand pounds of his patrimony in the ransom of slaves ; and his representations to Lord Caledon were the first in a series of movements on behalf of the oppressed aborigines, which in 1828 ended in their obtaining rights and privileges in all respects equal to those of the Dutch and English settlers.

Dr. Van der Kemp died Dec. 15, 1811. Although his own exertions were not crowned with the immediate and signal success which attended some less conspicuous labourers, he may well be regarded as the greatest modern benefactor of Southern Africa. His self-consecration and the glowing letters he wrote home, stirred both Britain and the Netherlands, and infected not a few with his own affection for the Hottentots ; whilst the efforts which he made for the civil enfranchisement, as well as the social and spiritual elevation of the down-trampled natives, entitle him to be regarded as the precursor of all those improvements to which Pringle, and Philip, and Fowell Buxton, and many other noble philanthropists, successively contributed, and to which the present benevolent Governor of the Cape colony is striving to give the consummation.

Situated at one of "the ends of the earth," it may be conceded that the Hottentot race had sunk down to be one of the extremes of humanity. Ignorant of all the mechanic arts, indolent, filthy, worshipping not even an idol, but a

ridiculous insect, and by their task-masters browbeaten into the belief that they were no better than baboons,—heartless, hopeless, they were treated as a more troublesome, though more intelligent kind of sheep-dogs. But accosted by the gracious accents of the Gospel, even these poor abjects have begun to rejoice in the hope full of immortality, and have astonished their old task-masters and contemners by their intelligence and industry. Under the fostering wing of Christian missions, they have congregated into little villages; and the following description of one of these near Algoa Bay shows how it looked some years ago:—

“I came in sight of the village as the sun was setting. The smoke of the fires just lighted to cook the evening meal of the home-coming herdsman was curling calmly in the serene evening air. The bleating of flocks returning to the fold, the lowing of the kine to meet their young, and other pleasant rural sounds, recalling all the pastoral associations of a Scottish glen, gave a very agreeable effect to my first view of this missionary village. When I entered the place, however, all associations connected with the rural scenery of Europe were at once dispelled. The groups of woolly-haired, swarthy-complexioned natives, many of them still dressed in the old sheepskin mantle; the swarms of half-naked children; the hovels of mud or reeds; the long-legged, large-boned cattle; the broad-tailed African sheep, with hair instead of wool; the ‘goeden avond’ (‘good evening’) courteously given, as I passed, by old and young; the uncouth, clucking sounds of the Hottentot language; these, and a hundred other traits of wild and foreign character, made me feel that I was far from the glens of Cheviot,—that I was at length in the land of the Hottentot.

“Afterwards I attended the evening service of the missionary in the rustic chapel of Bethelsdorp. The place was occupied by a very considerable number of the inhabitants of the village, a large proportion being females. The demeanour of the audience was attentive and devout, and their singing of the missionary hymns was singularly pleasing and harmonious. . . . Even among the rudest of the people there was an aspect of civility and decent respect, of quietude and sober-mindedness, which evinced that they were habitually under the control of far other principles than those which regulate the movements of mere savage men. They appeared to be in general a respectable and religious native peasantry.”*

* Pringle’s “Narrative,” 14-17.

When the aged missionary Marsveld was taken to see a bridge near Genadendal, supported on five massive piers, and strong enough for loaded waggons to pass over, and all of it the handiwork of Hottentots, he wept. And well he might. It was a great trophy. Nothing but the Gospel could have inspired such a people for such an enterprise. In keeping with this Lieutenant Stockenstrom states, that the land at Kat river is cultivated "to the astonishment of everybody who visits it." "At the station where I live," says a Moravian, "one half of the population subsists by working at mechanical arts,—cutlers, smiths, joiners, turners, masons, carpenters, shoemakers, tailors, and so on." And, looking at a list of various industrial productions, says Andrew Stoffel, himself a Hottentot, "we can make all those things except a watch and a coach."*

As with industry, so with morality. In three circuit tours which he made through the colony, a judge † stated that out of 900 cases before him, only two were Hottentots connected with missionary stations, and neither of these was a case of aggravated character.

Considering the many obstacles—not a few of them arising from irreligious Europeans—the success of the mission is most cheering. Towards the close of life Henry Marsveld wrote to a friend, "My strength is daily decaying; but I enjoy the presence and peace of my Saviour, and that is quite enough for me. Often do I reflect on days of old, and thank my God and Redeemer that he drew me, a sinner, into Himself, and granted me to know His love, power, and grace. He has even honoured me, who am so unprofitable, to be His servant, and has blessed my weak testimony of His death and sufferings for us. I have had the favour to baptize 415 Hottentots. It is now twenty-five years since,

* Harris's "Great Commission," p. 197.

† The Hon. Justice Burton.

in weakness and poverty of spirit, we began to preach to the people here, and the Lord opened the hearts of the Hottentots, so that His saving Gospel found entrance. Many of them have departed this life with joy, in full reliance on His merits: 477 lie buried in our burying-ground." And other societies besides the Moravian can reckon numerous converts.*

Some of these have been signal instances of God's saving mercy: none more noted than Africaner, who, from being the African Rob Roy—a free-booter, an outlaw, and a man of blood—spent his last years a meek, docile, and affectionate follower of the Lamb of God. In the experience, too, of these poor children of the desert there is much that reminds us of the records of religious biography in more favoured lands. For instance: Philip was the servant of a kind-hearted master, but he was a bad man and a scoffer. He used to jeer at his Christian countrymen, and when any one reminded him of the coming judgment and God's all-seeing eye, he would jestingly answer, "Ay, God Almighty would have a great deal to do if He took notice of everything that people do and say." But at last the hand of God arrested him. After a drunken debauch he was seized with such convictions of sin, that he could hardly rest day nor night. He suffered God's terrors and was distracted, and there was no one to guide or instruct him. One Sabbath evening he obtained leave to be present when the Scriptures were read in his master's family. One portion read was the parable of the Pharisee and Publican. As the farmer read the Pharisee's prayer, "That was a good man," thought Philip; "oh, that I were like him!" "But," as he afterwards de-

* In this paper we have confined our account to the Hottentots. The South African mission now includes the various Kaffir and other tribes. Amongst these the missions of the Free Church of Scotland number 298 communicants and 449 scholars.

scribed it, "when he came to the publican, and read how he had been justified, though he durst not lift up his eyes to heaven, but only smote upon his breast, saying, God be merciful to me a sinner, it went to my heart. Thank God, I thought, that such a wretch may find mercy. Now I have learned how a man must pray to God if he would be heard. I went immediately out of the house, and stood all that night and the following day in the fields, crying aloud in great agony, 'God be merciful to me a sinner!'" But his prayer was not instantly answered. He still wandered about carrying his heavy load of guilt, weeping, and finding no comfort. One night there came a fearful storm of lightning. Philip crept into the roof of a barn, and lay there trembling. He thought it likely that the lightning would strike him dead; and he only hoped that it would also burn the barn and his own blasted body, so that people might never know how awfully the scoffer had been punished. But the storm passed over; and, next morning, creeping out to a solitary place, Philip renewed his earnest cry, "God be merciful to me a sinner!" "Suddenly," as he related it, "as it were a sunbeam from heaven shone into my soul, and with it an assurance that God would forgive me my sins. I was overwhelmed with joy, and poured out my heart in thanksgivings, desiring to tell all mankind that my prayers were heard; and, as none were present to hear me, I called aloud to the trees standing before me: 'O ye trees, ye bushes, ye plants, ye flowers, yea, all the grass, thank and praise God with me, for He has forgiven me my sins!'" When he had learned the way of God more perfectly, it is interesting to know that Philip's conversations were, in turn, made useful to his kind-hearted master.

We have been struck and edified by some of the ingenious utterances of these poor people in conversation with their teachers. "Do you love the Saviour with your whole

heart?" said the missionary to a young man. "No, not with my whole heart. One-half is directed towards Him, but the other towards fine clothes, horses, and oxen." "I am a shepherd," said another, "and when I am alone, minding my sheep, I frequently think of our Saviour, as He represents Himself as the Good Shepherd. When one of my sheep runs away, and I am following it, I think, Thus did I run away, and my Saviour followed me to save me from the danger of perishing in the desert." "I cannot speak with you now," said a Hottentot woman, "for my heart is like a piece of land over which the torrents have burst, and covered it with sand and rubbish, till the good ground is no more visible. But I will not cease praying till our Saviour remove the mass of sand, and discover again the good ground he had given me."*

Very remarkable, too, and to some of us very reprov-
ing, are their simple trust in God and ready recourse to prayer. Jacob Conrad was on a journey with his son. They had no provisions, and by-and-by the son grew hungry and complained. "Never fear," said his father, "the Lord will take care of us." And sure enough, soon afterwards they found lying on the road a piece of bread sufficient to assuage their hunger, for which they both gave thanks to God. In a meeting of communicants one of them said, "When I consider the kind care of my heavenly Father, in the years of scarcity, I must still weep for joy. A farmer owed me some corn. I got one quarter of the measure, and when it was finished, and I went back for more, he turned me out of the house very angrily, and told me never to come to him again. I went away, and spent the night in the fields without food. I cried to the Lord: 'Lord Jesus, thou knowest that my wife and children are without food, and thou alone canst help me in this distress. Turn thou the

* "Missions in South Africa," p. 102.

heart of this man, that he may give me my corn.' Early in the morning the baas (master) came to me, and said, 'Come, Hottentot, and bring your sack with you.' He now put so much corn into it, that I was obliged to say, 'Stop, baas, or my little horse will not be able to carry it;' on which he told me, that when I needed more I should come again, and he would give me as much as I wanted." H.

DIVINE THOUGHTS IN THE FACTS OF CREATION.

WE now turn from our own planet, to —

II. *The Planetary System.*

According to the present findings of astronomy, that system consists of the sun, its centre, and eight large planets, besides many smaller,* varying in magnitude, distance from the centre, and velocity of movement, but all spherical in form; having a motion on their own axis and another around the sun, moving in one direction from west to east, and nearly, but not exactly, in one plane, and tracing in their orbit an ellipse, more or less approaching to a circle. Within the primary system, there are what are called the secondary systems, consisting of the satellites of the planets, the Earth having one, Jupiter four, Saturn eight, Uranus six, and Neptune one. If we may judge from our moon, respecting the rest of these bodies, they have three distinct motions: first, on their own axis; second, around the planet to which they belong; and third, along with their planet, around the sun. Besides these, there is yet another class of bodies belonging to the solar system, in many respects

* The ascertained number of planetoids, between Mars and Jupiter, is thirty-five.

widely distinguished from the planets and their satellites, viz. comets. Their substance is thin, luminous, and sometimes transparent. They are not confined to any plane in their orbits, but are found in all parts of the heavens. Their path, however, is elliptical, and they are governed by the same great law, as the other parts of the system. At the same time the ellipse which they describe, instead of approaching to a circle, as it does in the case of the planets, is indefinitely long and narrow. The number of the comets is supposed to be very great, and already several hundreds have been distinguished. It may serve to show the exactness and certainty which belong to the vast solar system, if we here notice that the time of the appearance of some of these least legalised parts of it can be calculated precisely. The comet called after Halley occupies seventy-six years in its revolution, and its reappearance has been predicted and verified exactly. This is true also of the comet called after Encke, which makes its circuit in less than four years. The ancient saying, "God works by Geometry," finds a wonderful interpretation in the planetary sphere. No mathematician ever displayed such perfect exactness, such unerring accuracy, as are exhibited in the movements of the solar system. Such an event as an eclipse of the sun or moon can be predicted to a day, even to an hour, years,—any number of years, before it takes place. Or the calculation may be retrospective, and it may be infallibly pronounced when, ages ago, such an event occurred. The father of history relates that Thales predicted the eclipse of the sun which happened during a battle between the Lydian king Abyattes, and Cyaxares the king of Media, and which had the effect of stopping the battle and leading to a peace.* There are some difficulties connected with the chronology of this fact which need not here be introduced. Suffice it

* Herodotus, i. 74.

to say, that the historian has been marvellously authenticated by the mathematician. The period of the battle, it is established on independent grounds, was about 610 before Christ. And calculation makes out that on the 30th of September, in that year, there occurred a total eclipse of the sun. A system in which, though relating to the greatest magnitudes and distances, such perfect and infallible accuracy is secured, can be nothing else than a thought-product,—the *outcome* of an intelligence to which no limit can be affixed.

The region into which we have entered exhibits magnitudes, and distances, and velocities, which, though we can determine, we cannot comprehend, and opens out to a vastness which confounds and overwhelms.

The globe we inhabit is eight thousand miles in diameter, twenty-four thousand in circumference, and ninety-five millions distant from the sun. Two of the planets are smaller than our Earth, Mercury being two-fifths, and Mars half its size. Venus is nearly of the same magnitude. Jupiter, the largest of all the planets, is eleven and a half times larger than our Earth, four hundred and ninety millions of miles distant from the Sun, and takes twelve years to accomplish his circuit. Saturn is less than Jupiter, but is nine hundred and six millions of miles distant from the Sun, and takes thirty years to accomplish his circuit. Uranus is about half the size of Jupiter, but is eighteen hundred millions of miles distant from the Sun, and takes eighty-four years to accomplish his circuit. Neptune is larger than Uranus, being six and a half times the size of our Earth. He is two thousand nine hundred millions of miles distant from the Sun, and takes a hundred and sixty-seven years to accomplish his circuit. But the Sun is not far short of one million and a half times the size of our earth, so that if all the planets of the solar system were united

into one, they would form only an insignificant fragment compared with his enormous magnitude. It is found that the Sun has a movement on his own axis, which he accomplishes in something more than twenty-five days. If our Earth, making one revolution on its axis, travels at the rate of a thousand miles an hour, the Sun, making one revolution on his axis in twenty-five days, must travel not far short of sixty millions of miles in an hour—a velocity this which we may put down in figures, but which defies all conception.

Except by the motion on his axis, the Sun's place in the heavens is unchanged, or if changed (as is now generally conceived) the change is inappreciable by all human means of discovery. He is the *fixed* centre of a mighty system. In space, to us illimitable, in empty space that prodigious sphere, thirty-four thousand millions of miles in circumference, is flying on his axis at a rate of speed not far short of sixty millions of miles in an hour. By what is his axis fixed and rendered immovable? An original projectile force, though its enormous amount overwhelms thought, would account for his motion on his own axis, but not for that axis being stationary. Why does he not fly off, in his stupendous whirl, into boundless space, dragging the planets along with him? What controls, what retains him, that so far as we know he moves on a point, and that point fixed through ages? If his attraction keeps the planets in their orbits, as we know it does, their attraction, inasmuch as their united masses constitute but a minute fraction of his magnitude, cannot control him. If we anticipate for a moment what belongs to the theory of the wider starry sphere, and suppose that the solar system is but a unit in a vast sum, and that the power and capabilities of the unit arise from its position in that sum; if we say that the Sun and all his planets form but a single star in the magni-

ficient firmament, and that that star is acted on by the mightier attractions amidst which it is placed, and out of the combined and complicated forces of all of which results a perfect and universal harmony,—do we not, by the very same token, take refuge in the region of almost pure thought? More and more we are forced to interpret *material* difficulties and contradictions, which would otherwise for ever multiply upon us, and be otherwise irreconcilable, by resolving them into *ideas*. That centre of the solar system, whirling in empty space, yet fixed and immovable, can be taken in by us, grasped by our understanding only as a thought—a beautiful, grand, sublime thought—which commends itself to our reason, because it is a product of reason, that reason which is in us, but is also over all.

The Sun is the central force governing, in consequence of his enormous magnitude, the movements of the lesser planets. He is also, as we have seen, the fountain of light and heat,—he alone is the fountain. Many other arrangements were-possible. One or more of the planets might have been luminiferous and the central sphere opaque. One or more might have been masses of fire, and the Sun and the other planets dependent on them for heat. It can be shown that from these or any such varieties of method, certain imperfections and certain evils to organised beings were inseparable. It can be shown, that the existing economy is the most perfect conceivable, securing alike uniformity, regularity, permanence, and universality of distribution. That the centre should be the one source of illumination and of warmth to the system, commends itself at once to reason; and the more extensively and severely it is investigated, it is found to be ever the more profoundly wise and the more perfectly adapted to all the conditions. But it was *an idea* before it became *a fact*,—it is a Divine idea expressed in the language of fact.

QUÆRENS.

MRS. SHERWOOD.

THE perusal of the "Life of Mrs. Sherwood" has strongly confirmed us in an opinion long since formed, that the *inventive* faculty is not so extensively bestowed as is often supposed, but that in the most successful works of fiction (so called) it is rather the power of grouping well together the remembrances of childhood and the experience of later days which tends to produce popularity. Perhaps this is true in a certain degree with regard to Poetry, Painting, and Music; for while there are few who can appreciate the higher flights of pure imagination, there are many who are affected even to tears by the simple versification of home thoughts, or the landscape of which every feature may be traced in some familiar scene, or the touching ballad which calls up in all their freshness bygone thoughts and feelings.

But our business is at present with Mrs. Sherwood and her Autobiography; and in this volume it is most interesting to trace the originals of many of those characters which, by her numerous tales, have become so familiarly associated with our nursery days or our school-girl reminiscences. With the latter class our authoress was an especial favourite, partly, perhaps, because, in consequence of the frequent interweaving of romance with religion which appeared in many of her stories, more of the forbidden fruit was found there than could usually be met with in a school-room library. Certainly all tastes might be suited, for the same volume would often present by turns a grave sermon and a highly-wrought novel, and some of our readers may still remember in what proportion these were severally received and digested.

Of Mrs. Sherwood's birth and parentage little need be said, for tables of genealogy are by no means interesting to

the "general reader." But over her education we must not pass so lightly, for by no ordinary training was she fitted for a life of many and strange vicissitudes. Her parents appear to have been persons of respectable descent and refined minds, but were strikingly contrasted in natural temperament: the father all kindness and large-hearted benevolence, with a smile for every fellow-creature he met, whether gentle or simple, old or young; the mother with a strong tinge of constitutional melancholy, shrinking from the most distant approach of what was coarse and uneducated. In personal endowments, too, the difference could hardly have been less apparent. The Rev. George Butts must have been a man of attractive exterior, while his wife, we are told, was "a very little woman, having a face too long in proportion, with too decided features. She was marked, too, with the small-pox, and had no personal beauty but in her hands." A truly Daguerreotype portrait. She had been the intimate friend of a lovely young woman to whom Mr. Butts would have been married, had not an untimely death prevented their union, and it was in obedience to parental wishes that he next turned his thoughts to Miss Martha Sherwood. That a very tender feeling for the departed friend of their youth lingered in the hearts of both we may gather from the fact, that her name was bestowed, in conjunction with that of the mother, on their eldest girl, who was baptised as *Mary* Martha.

And thus "into this world of many changes," our authoress tells us, she was introduced on the 6th of May, 1775. At that time her father was residing at his living of Stanford, in Worcestershire, where truly "the lines had fallen to him in pleasant places." Very tempting is the description given of the Rectory and its surroundings. "Few have travelled farther, or perhaps seen more than I have; but yet, in its peculiar way, I have never seen any region of the earth to

be compared with Stanford. The parsonage-house commanded four distinct views from the four sides, and so distinct, that it was difficult to conceive how these could have been combined in a panorama. On the front of the house, towards the west, a green lawn, with many fair orchards beyond, sloped down to the bed of the Teme, from which arose, on the opposite side of the river, a range of bold heights richly diversified, at a distance so considerable as only to show its most pleasing features, such as copses, farm-houses, fields of corn, villages with their churches, and ancient mansions. The hills of Abberley and Woodbury terminated the view: the one being celebrated for the encampment of Glendower, and the other for Abberley Lodge, the seat of William Walsh, the friend of Addison, and supposed by some to be the place wherein was written the fine old character of Sir Roger de Coverley, though this I have heard disputed in later years. On the south, my father's house looked over Sir Edward Winnington's park, to form and adorn which a whole village had been sacrificed; whilst Broadway and fair Malvern gave their beauties to the scene, separated from us only by the silver Teme, which near that spot empties itself into the river Severn. The hills and lands, on the east, were so richly wooded that the country partook there more of forest scenery than aught else I could name, neither were waterfalls wanting; whilst, on the north, we had orchards of fruit-trees and cultivated fields, presenting altogether such regions of varied beauties, that my eyes, as I said before, have never seen the like since."

Thus rich and varied were the charms of the outward world, while within, the parsonage seems to have been well stored with books and pictures, which in due time exercised a strong and lasting influence on the child's opening mind. Her brother, an imaginative boy, scarcely more than a year older than herself, was the companion of many a pleasant

ramble and fire-side book. Together they read "Robinson Crusoe," "Fairy Tales," and "Æsop's Fables;" together they made their first essays at juvenile composition, their fond father persuading himself that both were *geniuses*. Perhaps it is best to sum up in her own words the impression made upon her mind in later life by a retrospect of this period.

"It was the fashion then for children to wear iron collars round the neck, with a backboard strapped over the shoulders: to one of these I was subjected from my sixth to my thirteenth year. It was put on in the morning, and seldom taken off till late in the evening; and I generally did all my lessons standing in stocks, with this stiff collar round my neck. At the same time I had the plainest possible food, such as dry bread and cold milk. I never sat on a chair in my mother's presence. Yet I was a very happy child; and when relieved from my collar, I not unseldom manifested my delight by starting from our hall door, and taking a run for at least half-a-mile through the woods which adjoined our pleasure-grounds."

We have surely extracted enough to prove that buoyancy of spirit was one of the marked characteristics which, thus early developing itself, proved in after-life so great a solace in trial and help in duty.

Meantime the worthy Rector of Stanford had been appointed, in 1784, one of the chaplains-in-ordinary to his Majesty George III., and the visits which, in the exercise of his official duty, he paid to London in the month of November, afforded a rich store of amusing and courtly anecdotes to the quiet circle at home. We are scarcely justified, perhaps, in such a description of the family party at the parsonage after the introduction among them, as an inmate, of a certain Madame de Pelivé, a distant connexion, who, having been with her husband in Paris during the

outbreak of the Revolution, returned to her native country straitened in circumstances, and glad to accept the hospitality of the English parsonage. We cannot resist the temptation of giving an account of her arrival at Stanford, bearing in mind the character already given of the lady at the head of the household:—

“She arrived in a post-chaise, with a maid, a lap-dog, a canary-bird, an organ, and boxes heaped upon boxes, till it was impossible to see the persons within. I was, of course, at the door to see her alight. She was a large woman, elaborately dressed, highly rouged, carrying an umbrella, the first I had seen.”

At this time, if we may believe her own description, Mary Martha Butts was “a tall, unformed, awkward girl, with very long hair and very rosy cheeks,” just the sort of raw material, in short, a woman like Madame de Pelivé would delight to encounter. While the lively lady was adorning the young head with a “gauze cap of a very gay description,” its internal furniture was receiving considerable additions by access being granted to a new store of books, containing several romances, Sir Philip Sidney’s “Arcadia” and many volumes of the Fathers; the “Travels of George Sandys,” too, were among these treasures, all, doubtless, contributing their share toward the formation of her habits of thought.

But in her thirteenth year the happy Stanford home was exchanged for one far less attractive. The family removed to the valuable living of Kidderminster. Here, as elsewhere, the benevolent heart of the pastor found ample means of gratification; while his more timid wife, finding little that was congenial in the companionship afforded by a manufacturing town, withdrew herself more and more from intercourse with the world, and spent her days in vain lamentations for the lovely retirement she had left, till her

health completely gave way. We must pass hastily over Kidderminster life, and open the page of our authoress's school history, one which certainly could find no parallel in our own days. The scene is now removed to Reading, where, in 1790, Mr. Butts accompanied his old friend Dr. Valpy to see a sort of exhibition got up by the young ladies of M. and Mme. St. Q.'s school. "My father was delighted with all he saw there. This, he thought, is the very place for Mary."

And Mary was accordingly placed under the charge of these somewhat unusual teachers. We do not exactly perceive what is meant by her observation, "I believe he was divinely directed in his choice," for certainly we should not think the *régime* adopted there the best calculated to form a valuable female character. Scarcely less changed is the outward aspect of that school's immediate neighbourhood than the routine of education which would now be pursued within its walls. The Forbury at Reading was an open green around which the Abbey School (with which we are now concerned), and other considerable houses stood, surrounded by old-fashioned gardens. Where are those gardens now? The railway-station stands on the very borders of the green, the splendid gaol occupies a part of the very ground on which the ruins of the Abbey stand, the not very inviting words 'To let' appear in the windows where once those merry young pupils might be seen, while a peep obtained through a crazy gate at the back reveals a garden going rapidly to decay. The house itself was connected with the Abbey-gate, in the turrets of which were little nooks and passages, which must have been a perfect treasure-house of mystery to the more romantic of the young ladies. The broken windows look desolate enough now, and, in "this world of many changes," the Forbury at Reading has shared the common lot. But, in 1790, its history must

have been stirring indeed. The heads of the establishment were by no means common characters. The teachers,—who shall describe them but our authoress herself? “The three teachers sat round the fire; each had on, what was called in those days, a close cap, that is, a large muslin, rather blowsy cap, which was to hide black pins, curl-papers, &c., &c., the rest of their dresses being equally indicative of some domestic bustle. . . . The first was a little simpering English woman, very like a second-rate milliner of these days; she taught spelling and needle-work. The second was a dashing, handsome, rather slovenly French girl, who ran away with some low man a few months afterwards. The third was, I think, a Swiss, and though plain and marked with the small-pox, had some good in her, I apprehend; but I had not the wit then to find it out.” Little enough seems to have been required of the first-class young ladies in the way of study. After an hour or two with their tutor in the morning, they were left to amuse themselves in their own way. “Whether we gossipped in one turret or another; whether we lounged about the garden, or out of the window above the gateway, no one so much as said, ‘Where have you been, mademoiselle?’”

After a year’s sojourn at Reading Abbey, Mary Butts was joined by her sister Lucy, to whom she seems to have been through life most warmly attached. It was an eventful time. French troubles were at their height. Louis XVI. had fallen a victim to popular fury, and many of his attached followers among the *haute noblesse*, had found an asylum amongst sympathising friends at Reading. Of course the foreign connexions of M. de St. Q. made his house a rendezvous for them. “Amongst them were several single, and some married men, who were always about the house during the day, and very frequently came to supper in the evening.” Then followed, in the French style, a strange

medley of Royalist tears and theatrical entertainments, in which Mary Butts bore her part, occasionally botanising with an abbé, who strove to win her over to the Romish faith, at others listening to the dangerous flatteries of the fascinating courtiers. In all this there must have been more of education than of instruction ; and such a state of things could scarcely fail to bring out all the folly that was bound up in the hearts of these poor girls, thus prematurely exposed to the world's temptations.

Soon after her finally leaving school, Mr. Butts returned with his family to the Stanford home, but over that place of "sunny memories," a cloud of sorrow was soon to pass which forever changed its aspect. Affliction weighed heavily on the occupants of the hall, and ere long it reached the once joyous parsonage. The beloved rector was removed by a stroke of paralysis, and the widow and children sent forth to seek another resting-place. Again the morbid melancholy of Mrs. Butts' character appeared, and her choice of a new home seems almost to have been determined by a pre-eminence of discomfort, which a cold and forlorn house in Bridgenorth appeared to possess. A description of it, which would have sufficed to deter most people from further negotiation, fixed her choice in its favour, and to a house in the High Church Yard accordingly the mother and daughters removed in the spring of 1796. What a change for the sisters ! They employed themselves as cheerfully as they could in reading and writing, and during their brother's long vacation Mary studied Greek with him, and was soon put into Homer. A new source of interest opened for them in the charge of a Sunday-school, in which they worked assiduously, and we may hope in some measure successfully, though there is no reason to believe that at this time any considerable amount of religious knowledge was possessed by either. "We made bonnets and tippetts for our girls ; we

walked with them to church; we looked them up in the week-days; we were vastly busy; we were first amused, and next deeply interested."

But ere long a visitor was received at the dull house in the High Church Yard, who was at a future period destined to alter entirely the lot of one of the sisters, and whose biography becomes interwoven with her own. Want of space alone prevents our transcribing portions of Henry Sherwood's life (in itself a perfect romance). Almost self-educated, his history presented a succession of remarkable vicissitudes. While his father, a violent Republican, residing in France, was wholly given up to politics, and his stepmother leading an invalid life in her chamber, the boy was left entirely to his own devices. At one time serving on board a French gun-boat; at another, lodging with a poor washerwoman at St. Vallery; then confined with fifty of his countrymen in a French prison; next, escaping with his parents to Geneva, and there living in strict retirement and poverty dependent upon the kindness of friends, he at length, through a succession of hair-breadth escapes, made his way to England, and presented himself before a blind and aged aunt, who kindly received the young wanderer, and restored him to more influential relations. It was during the visit to Bridgenorth, of which we have spoken, that he was induced by a military friend to enter the army, and, having returned in 1803 from foreign service, he addressed from Hulsea Barracks a letter to his cousin, Mary Butts, which issued in their marriage some months later. It was on the last day of June that she assumed the name by which she will long live in the hearts of English children; and we are led thus from the contemplation of her "maiden to her married life."

A few incidents connected with it may form the subject of a future paper.

LIFE, IN ITS HIGHER FORMS.

No. V.

MAMMALIA.

By universal consent, those animals which we generally call Quadrupeds are placed in the highest rank of organic life. Perhaps it would be scarcely true to say that a Guinea-pig or an Ant-eater is superior in energy and development to a Falcon, superior in those characters which determine relative rank in being; but this only shows—what we have had repeated occasion to state—that the range of animal existences cannot be included in a linear series. The Ant-eater and the Guinea-pig are members of a great group of creatures, which are manifestly associated together by a closer bond than that which allies them, or any one of them, to other creatures; and this great group possesses, as a whole and characteristically, though in degrees differing *inter se*, the various senses, powers, and faculties, both bodily and mental, that belong to an animal in a higher state of development, than any other equivalent group.

The term “Quadruped” is applicable to this Class, not in scientific strictness, but only in popular freedom of speech. One whole Order—that of the Whales and Dolphins—is entirely destitute of the hinder pair of limbs, and the external form of their body is fish-like, as are also their habits of life and the medium in which they reside; yet these animals have far greater and more important affinities with Quadrupeds than with Fishes, and must therefore be grouped with the former rather than with the latter.

The term “Mammalia,” derived from *mamma* (the female

breast), suggests a character of great physiological value and of invariable application, by which the creatures of this Class are distinguished from all others. *They suckle their young*, which are in all cases brought forth alive (*i. e.* not inclosed in eggs), and are nourished for a time with milk, a fluid secreted in the body of the female parent.

As, with the trivial exception of the Bats, which flutter in the air, the sphere of this Class is the solid earth or the dense water, the provisions for that energetic respiration and for that high temperature of the blood, which are necessary for Birds, are wanting here. In other respects, however, the respiratory and circulating systems do not essentially differ in the two classes.

The jaws are, almost invariably, furnished with *teeth*, which play an important part in the economy of the animal, being intimately associated with its sustenance. They are solid pieces of bone covered with a much harder substance called enamel, which grow out of sockets in each jaw. They are placed in single series, and vary much in form, according to the nature of the food which sustains the animal, as well as according to their position in the mouth. In Man, there are in each half of each jaw two front teeth with a chisel-like edge, called Incisors, or cutting teeth ; one more pointed, called the Canine, or Dog-tooth, or sometimes Eye-tooth ; two somewhat flattened at the top with single fangs, called False Molars ; and three behind all with compound fangs, and broad, somewhat hollow surfaces, called True Molars or grinders. In those races which feed exclusively on flesh, the molar teeth partake of a cutting character, while in those that subsist on grain and herbage, the molar or grinding structure prevails throughout the whole. Sometimes the incisors are curiously developed ; in the Squirrel, Rat, and similar animals (RODENTIA), they project forwards in a curve, meeting at an angle, and are

continually growing ; in the Elephant they stand out in the form of huge curved tusks, and in the Narwhal one is commonly undeveloped, while the other grows into a long spirally-twisted straight tusk like a horn in front of its head. The Whale has no teeth, but a series of horny plates, parallel to each other, depends from the upper jaw, and constitutes the valuable substance called whalebone. In the Ant-eaters, and some others of the EDENTATA, there are no teeth at all, while the Armadillo has ninety-six, and some of the Dolphins have a hundred and fifty.

Considerable variation, suggesting diversity in function and habit, is also found in the forms assumed by the extremities. The Carnivorous tribes, the Rodents, and some others, are furnished with paws, divided into toes, which are terminated by claws ; and thus their feet are not only supports in walking, but are endowed with a grasping, tearing, or scraping power. On the other hand, the feet of the Thick-skinned and Ruminant tribes are encased in solid hoofs of horn, which may be single, as in the Horse ; double, as in the Sheep ; three, as in the Rhinoceros ; four, as in the Hog ; or five, as in the Elephant. A hooped foot can never be anything else than an instrument of locomotion. In the Apes and Monkeys, the feet become *hands* ; all of them having a thumb set on a different line from others, and susceptible of being opposed to them, whereby the prehensile power is immensely increased, and the capabilities of the organ are greatly varied.

In all these cases, all of the extremities are of the same form, but there are some in which the fore and hind feet differ from each other. Thus, in the Bats, while the hind feet have five short clawed toes, the fore ones have the first four fingers immensely lengthened, like the ribs of an umbrella, across which a delicate membrane is stretched, and thus the fore limbs become organs of flight. And in

Man, who by his organic nature comes into this Class, the feet are merely fitted for walking, while the anterior extremities, forming hands incomparably more delicate and more versatile than those of the Apes, are capable of executing by their skill or power the wonderfully various requirements of his reason. Finally, the anterior members of the Whales, which, as has been already observed, are all that they possess, are mere swimming fins, the bones of the toes being imbedded in a dense and leathery skin, which reveals no trace of their individual form or division.

The body of the MAMMALIA is covered more or less densely with *hairs*, which, if less elaborate and complex than the feathers of Birds, are still interesting in their structure. A hair is a long pointed cylinder of horny substance, formed within a minute cavity on the surface of the body, and growing by continual additions to its base. The cavity is lined by a reflection of the common skin, and contains a vascular pulp well supplied with nerves and blood-vessels. From the surface of this pulp the horny substance of the hair is secreted, which, perpetually increasing from below, pushes upward the portion already formed, and thus increases in length.

“Various are the appearances,” observes Professor Jones, “and widely different the uses, to which epidermic appendages, in every way analogous to hair, both as relates to their composition and mode of growth, may be converted: the wool of the Sheep, the fur of the Rabbit, the spines of the Hedgehog, the quills of the Porcupine, the scaly covering of the Manis, and even the armour that defends the back of the Armadillo, are all of them but modifications of the same structures, adapted to altered conditions, under which the creatures live. Even the horn upon the snout of the Rhinoceros is but an agglomeration of hairy filaments, formed upon a broad and compound pulp. The nails and claws

that arm the fingers and toes, the corneous sheath that invests the horns of the Ox and Antelope,—nay, the hoofs of herbivorous quadrupeds, are all epidermic secretions from the vascular cutis, or, in other words, are hairs altered in their form and extent, according to the exigencies of the case.”*

Many of the hoofed Quadrupeds are armed with horns, which differ greatly in structure from those of the Rhinoceros and the Ox. Those of the Deer family, whether palmated like those of the Elk, branched like those of the Stag, or simple like those of the American Roes, are annual growths of bone, which are shed and renewed periodically. In an old well-antlered Hart, a “Stag of ten,” such as our old poets delight to describe, the process of renewal is one of amazingly rapid energy. In the spring the bony knobs on the skull, covered with skin, begin to swell, tides of blood rush to the head, and great heat and tenderness characterise the prominences. The arteries deposit bone with great rapidity, and the budding-horns grow daily, still covered by a vascular skin, which is, indeed, a tissue of blood-vessels. The skin is covered with a dense short hair, which is technically called “the velvet.”

At length the horns, with their branches and antlers, are fully formed, and are still covered with this velvety skin, which is highly sensitive. The arteries now begin to deposit a rough ring of bone around the base, with grooves, through which the great arteries pass. Gradually these grooves are filled up with bony matter, and the arteries, compressed by the constantly added matter, transmit less and less blood to the “velvet,” until at length the latter receives no more. It now dies for lack of sustenance: shrivels, dries, and peels off in shreds, or is rubbed off by the animal against the trees and palings. The horns are

* “Outline of Anim. King.,” p. 688.

now no longer sensitive, but can be used as effective weapons of offence. After a time, however, the thick ring of bone begins to be absorbed, particle by particle, and the absorptive process goes on until a complete separation of the horn is effected, which then falls off by its own weight from the basal prominence. The latter is presently covered with skin, and awaits the return of spring to bud anew.

The geographical distribution of animals is a subject of great interest to the naturalist; that is, the manner in which we find particular species either spread over considerable portions of the world, confined to small tracts of country, or appearing in remote but isolated regions. No country affords more interesting phenomena connected with this subject than the continent of Australia with its circumjacent islands. Excluding the Seals and Whales of its coasts, the Mammalia, known to inhabit this great region,—as large as Europe,—amount to about a hundred and twenty species, the whole of which are absolutely confined to it. Of these about a hundred are marked by some remarkable peculiarities of structure, which have induced zoologists to separate them from all other MAMMALIA, forming them into a Sub-class by themselves, under the name of MARSUPIALIA. In order to appreciate the importance of these facts, we must look at the part which this Sub-class plays in the zoology of other parts of the world. The total number of terrestrial Mammalia known may amount to about 1700 species, of which 137 are Marsupialia. The facts will be better seen if placed in juxtaposition, thus:—

The Australian region contains	120	terrestr. Mammalia.
" " "	100	Marsupialia.
The whole world besides contains	1580	terrestr. Mammalia.
" " "	37	Marsupialia.

Thus we find the Marsupial Mammalia almost confined to Australia, and Australia almost confined to them.

The most obvious peculiarities which distinguish these animals, and which have conferred upon them their scientific designation, are the immature condition of the young at the time of birth, and its reception into a pouch (*marsupium*) or fold of the skin on the abdomen of the female, in which it is protected from exposure to the air and injury; while, suspended from the teat, to which it is very early attached, it gradually assumes the form of its adult condition, and acquires the powers necessary for its independent existence. For some time, however, after it is able to procure its own living, and to run and play by the side of its mother, the young Marsupial instinctively flees to the maternal pouch for protection on the approach of danger.

But besides these more obvious peculiarities, there are others scarcely less important, which are recognised by the comparative anatomist. Diversities in the reproductive organs, in the arterial system, and in the structure of the brain; the open condition of the skull, the bones of which remain permanently separate; the tendency to a multiplication of the teeth; the presence of marsupial bones in the skeleton, even where the *marsupium* itself is not developed; and the absence of a true voice,—all manifest a departure from the high development of the placental MAMMALIA, and an approach to that of the oviparous VERTEBRATA in general, and to that of the REPTILIA in particular.

This affinity with REPTILES is most marked in two very singular little animals, the *Echidna* and the *Ornithorhynchus*. They are the lowest forms of MAMMALIA, displaying some points of similarity to Birds, but more to the Lizards, especially in the structure of the sternum or breast-bone, of the shoulder, and of the limbs generally. The latter in particular, known as the Duck-bill, caused no little astonishment,

and even suspicion, among zoologists, when the first specimens were sent from New Holland to Europe. Here was a four-legged animal, covered with hair, but having the feet webbed like a water-fowl, and furnished with a beak, closely resembling that of a duck! For a long time it was believed that the reproduction of this most anomalous creature was by means of eggs; but it is now ascertained to produce living young, which are suckled like those of other quadrupeds. Mr. G. Bennet has described, in a very interesting Memoir,* the habits of life of these curious creatures.

Few as are the members composing this Sub-class, they include what we may consider as the parallels or representatives of most of the Orders of the typical MAMMALIA. Thus the Opossums in their opposable thumbs, seem to represent the Monkeys, the little *Myrmecobius* the Shrews, and the Kangaroos the *Ruminants*; while more strongly drawn analogies exist between the *Dasyuri* (the "Zebra-wolf," "native-devil," &c., of the Australian colonist) and the *Carnivora*, between the *Phalangistæ* and *Petauri*, and the *Rodentia*, and between the Duck-bill and Spiny Ant-eater, and the *Edentata*.

The largest and most attractive, as well as most valuable animals of this Class are the Kangaroos (*Macropus*). Every child is familiar with its elegant taper figure, its gentle deer-like face, its short fore-feet dangling at its breast as it stands erect on its long and powerful hind limbs and its immense tail. There are few, moreover, who have not read of its singular mode of progression, by vast leaps, through the Australian *scrubs*. Its flesh is excellent venison, and the European settlers hunt it with hound and horse. Mr. Gregson describes in a graphic manner a fine run of eighteen miles, performed by an old *boomer*, as the Great Kangaroo is called, and adds the following more general

* "Trans. of Zool. Soc.," vol. i. p. 229.

notes of its habits, with which we dismiss the *MARSUPIALIA* :—

“We did not measure the distance of the hop of the Kangaroo; but on another occasion, in which the boomer had taken along the beach, and left the prints in the sand, the length of each jump was found to be fifteen feet, and as regular as if they had been stepped by a serjeant. When a boomer is pressed, he is very apt to take to the water, and then it requires several good dogs to kill him; for he stands waiting for them, and as they swim up to the attack, he takes hold of them with his fore-feet and holds them under water. The buck is very bold, and will generally make a stout resistance; for if he cannot get to the water, he will place his back against a tree so that he cannot be attacked from behind, and then the best dog will find him a formidable antagonist. The doe, on the contrary, is a very timid creature, and I have even seen one die of fear.”*

P. H. G.

LINES ON EGYPT.

EGYPT!—thou wonder of the primal age,
 In the Nilotic valley, long ago,
 The priest of Ammun,—the Memphitic sage,
 Inscribed the preface to what man may know
 Upon thy granite obelisks—in tombs
 Where mummies, relics of thy great ones, lie :
 In the stupendous pyramids, whose rooms
 Abysmal, cavernous, may time defy.

* Gould's "Mamm. of Austr."

Whence were thy people, Egypt?—whence the might
 And wealth of Menes, the first Theban king?
 Who taught thy sacerdotal class to write
 In hieroglyphics? Did their knowledge spring
 From ancient Meroe? Was the light that shone
 Upon thine orient, in the morn of time,
 Kindled by Hermes?—or a radiance thrown
 Into thy valley from some western clime?
 Who shall resolve these riddles? who collate
 Thy fables, and translate them into truth?
 Who place thy unplaced kings, or give the date
 Of those who reigned when Saturn was a youth?

That thou in age wast hoary, the long range
 Of temples, tombs, sarcophagi, declare;
 And thy vast superstitions, vile and strange,
 Proclaim Idolatry grown dotard there.

Instructive lesson! Time developes mind,
 And nations, by the lapse of years, grow wise;
 But, God unknown, the human mind is blind,
 And reason sinks in her attempts to rise.

God is unknown to reason; ye might gaze
 On *Phra*, your sun-god, till the eye would be
 Confused and cloudy; but as through a haze,
 Or darkened glass, his texture ye might see;
 So, God of Hosts, the soul may gaze on Thee.—
Jesus REVEALED, yet VEILED—the Deity.

J. W. (Ohio.)

EGYPT: ITS ARCHITECTURE, SCULPTURE, AND PAINTINGS.

IN continuation of the interesting subject—the analogy between the metaphorical expressions of the Sacred Writings and the metaphorical sculptures of Egypt—we must refer back to a former engraving.* It represents a restoration of the propylon or gate of the Temple of Luxor on the eastern or right bank of the Nile. This celebrated ruin of ancient Thebes is in a state of excellent preservation, though the lower portion is buried in the accumulated rubbish of the modern village. For the purposes of our illustration we have thought proper to remove the accumulation from the base of the towers, and to restore to its place, on the left side of the gate, the Obelisk now in the Place de la Concorde at Paris. We have also uncovered the sphinxes of the great avenue which extends from the front of this Temple, to the side entrance of the Temple of Karnak, a distance of about 2500 metres. To make our restoration complete, we have inserted into the four grooves in front of the towers the tall flag-staffs which were held or affixed by means of certain contrivances projected out of the square perforations, to be seen precisely above the grooves. These grooves, and holes or chambers, are invariably found in all the towers of the propyla that flank the entrances to the temples of Egypt, whether of the period of the Pharaohs or of the Greek kings. The chamber passed right through the tower from the front to the back, whereas the grooves were only on the front. That the purpose of the chambers and grooves was for fixing the flag-staffs we learn from representations on the walls. Still better to transport the imagination of our

* See vol. v., p. 228.

readers to the spot, at the time when the metaphorical expressions were written, and the metaphorical sculptures we are about to compare with them were carved, we have represented a procession as issuing from the court behind the tower of the propylon. The king on his throne, carried by his guards, is just passing the threshold of the gate, attended by the fan-bearers and other officers of the household: the avenue leading to the temple is lined by chariot-eers and foot-soldiers, the whole being suggested by existing documents, and representations still extant upon the walls of tombs and temples. In the distance to the right of the spectator is the limestone peak of the Biban-el-Moluk, and the excavated hills of the opposite side of the Nile.

Without pausing to speculate as to whether this gateway was one of the hundred gates of the city of Thebes, out of which Homer tells us the warriors of Memnon issued to the Trojan war (*Iliad*, ix. 381), we will at once proceed to our immediate subject-matter. It will be observed, that on each side of the gate is seated a colossal statue of the Pharaoh who built this entrance to the Temple of Luxor, and that in front of each tower is a similar statue. This is to be especially noted, for in no instance does a statue of a king occur among the ruins of Egypt except by the side of a gate. It is probable that these important statues were so exclusively placed in obedience to an ancient custom, of which the first mention is found in *Genesis*, xviii. 1, 2; and again, chap. xxii. 17, there is an allusion to the same custom in the promise made to Abraham that his posterity should possess the gate of their enemies—that is, as we see in our picture, to sit as kings and governors at the gate of the city or palace. The gate was the place of honour and of judgment among the ancients. “Judges and officers shalt thou make thee in all thy gates.” (*Deut.* xvi. 18.) It was in the gate of the city of Hebron that Abraham

ratified, in the presence of the chiefs of the city, his purchase of the field and cave of Machpelah. (Gen. xxiii. 10.) It was in the gate of Bethlehem that the elders of the city assembled to give judgment in the case of Boaz and the relative of Naomi. (Ruth, iv. 1-11.) It was "beside the way of the gate" that Absalom stood to pervert any man who "came to the king for judgment." "And Absalom said unto him, See thy matters are good and right; but there is no man deputed of the king to hear thee." (2 Sam. xv. 2-5.) When, at the remonstrance of Joab, David ceased from mourning for Absalom, he "arose and sat in the gate. And they told unto all the people, saying, Behold, the king doth sit in the gate. And all the people came before the king." (2 Sam. xix. 8.)

Amos (v. 15, 10, 12) exhorts Israel to "establish judgment in the gate." He says also, "They hate him that rebuketh in the gate; they afflict the just, they take a bribe, and they turn aside the poor in the gate from their right." So likewise Isaiah, xxix. 21, "And lay a snare for him that reproveth in the gate."

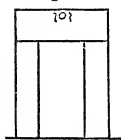
The foregoing quotations sufficiently prove the custom and the agreement between the metaphors derived from the Sacred Writings with what we have called the metaphorical sculptures of Egypt. That this custom was universal among the nations of antiquity may be inferred both from Scripture and other sources. Jeremiah tells us (xxxix. 3) that "all the princes of the king of Babylon came and sat in the middle gate." And again, we learn (Dan. ii. 49) that Shadrach, Meshach, and Abednego, were set "over the affairs of the province of Babylon; but Daniel sat in the gate of the king." See also Esther, ii. 19, 21; and iii. 2. To take another example from antiquity, we will quote the Monument of Harpagus (about B.C. 530), brought from Xanthus by Sir Charles Fellows. In this monument the

Persian Satrap is represented as sitting at the gate of the city, attended by his umbrella-bearer, and accompanied by the officers of his court. He is either receiving the ambassadors of Greece, or else is giving judgment in the case of the three men who are standing before him dressed in the garb of the orators of Greece. The tenacity with which the peoples of the East adhere to their ancient traditions has caused this custom, among others, to be handed down even to the present time, as may be traced in the title "*Sublime Porte*," derived from the practice of administering justice and despatching public business at the gates.

We cannot quit this subject without remarking upon the simplicity of an Egyptian gate, with its undisguised lintel and doorposts, all so vividly reminding us of the memorable night on which so many doorposts and lintels in Egypt were marked with the blood of the passover. "And they shall take of the blood, and strike it on the two side-posts, and on the upper doorpost of the houses wherein they shall eat it." (Exod. xii. 7.)

The lintel was always of one stone (Fig. 12) and the doorposts also were very frequently of only one

Fig. 12.



block, while each of the three portions had its appropriate decoration. In the smaller doorways, where no curvetto and torus were super-added, the lintel bore the winged globe or protecting divinity of entrances, and was besides decorated with the names of the divinities to whom the temple was dedicated, and of the Pharaoh who built it. The doorposts also bore the name and title of the builder. In the larger gates, such as the propylon of Luxor, the globe was sculptured in the curvetto, and the posts decorated with figures of the king making offerings to the different divinities.

On each corner of the lintel is a representation of the

king in a running action, and holding two vessels in his hands, in readiness to pour out a libation to the gods. (Fig. 13.) This subject is frequently repeated on the lintels of doorways, and the haste signified by the action of the king is suggestive of the same idea expressed in the words of the Psalmist (xvi. 4), "Their sorrows shall be multiplied that hasten after another god: their drink-offerings of blood will I not offer, nor take up their names into my lips."

Fig. 13.



The next metaphorical sculpture we shall notice frequently occurs in the sacred writings, and likewise in the sculptures. Thus, in Ps. lxxiii. 8, "My soul followeth hard after thee: thy right hand upholdeth me." Again, "I am continually with thee: thou hast holden me by my right hand." (Ps. lxxiii. 23.) And among the earliest examples of the same metaphor in Egyptian sculpture (Fig. 14) one is to be found on the west face of the Obelisk of the

Fig. 14.



Atmeidan in Constantinople, and another on the apex of the Lateran Obelisk, both the work of the same Pharaoh, Thothmosis III., who, according to Egyptologists, reigned before the time of Moses. In both these cases the inscription begins with the metaphor, as does likewise Isaiah, xlv., "Thus saith the Lord to his anointed, to Cyrus whose right hand I have holden, to subdue nations before him; and I will loose the loins of kings (see "Girdle of Strength," p. 235) to open before him the two-leaved gates."

In many instances the divinity is made to promise the king dominion and long life; "There shall not be any among the kings like unto thee all thy days." "And if thou wilt walk in my ways, as thy father David did walk, then I will lengthen thy days." (1 Kings, iii. 13, 14.)



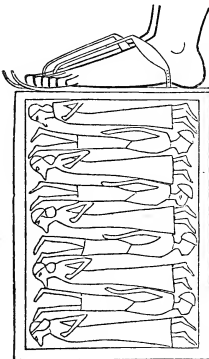
The sculpture of analogous metaphorical import, is the representation of the king standing between two of the divinities of Egypt who pour over him, as water out of a vase, a stream of hieroglyphics, symbolising life  the symbol held by the god to the nostrils of the king in

Fig. 14, and dominion  the staff that supported the heavens, Fig. 14; sometimes life only.

The next metaphor is common in both the Old and New Testament, and is exactly embodied in the sculptures of Egypt. "Thou madest him to have dominion over the works of thy hands; thou hast put all things under his feet." (Ps. viii. 6.) "A nation meted out and trodden under foot." (Isa. xviii. 7; xlix. 23; lx. 14.) "Sit thou at my right-hand, until I make thine enemies thy footstool." (Ps. cx. 1.)

This particular metaphor is literally rendered in Egyptian sculpture, for there is scarcely a statue of a Pharaoh in existence which does not rest the feet on a footstool, on which is engraved a

Fig. 15.



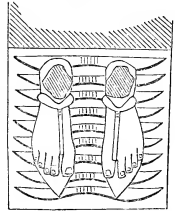
row of prisoners* (Fig. 15), or else place his feet on nine bows (Figs. 16, 17) signifying, as there is reason to believe, nine tribes or nations.

In one monument the infant king, Thothmes, is represented as placing his foot on a footstool, on which are sculptured nine prostrate figures, five bearded and long-robed, signifying Asiatic peoples; and four beardless and with short-ropes, the distinctive marks of African tribes. An example of

* See figure of Rameses. Crystal Palace.

this metaphor occurs in the basso-relievo from Kalabshe, exhibited in the upper Egyptian room of the British Museum, where the Pharaoh, Rameses II., is seen trampling on two individuals of different Asiatic nations, while he is about to despatch a third. A yet more speaking evidence, however, of this metaphor, common to both the descendants of Heber and of Mizraim, will be found in the very same room of the British Museum, we refer to the Mummy of Harsen-t-atf—on the soles of whose shoes are painted the figures

Fig. 16.



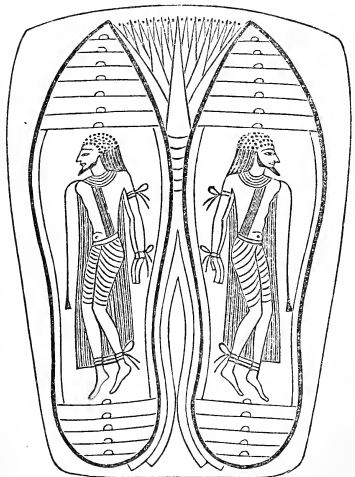
of two men with their arms tied behind them, (Fig. 18) embodying the metaphor in an un-



mistakeable form,—for these figures represent Asiatics, of that particular nation to the North of Egypt, the most constant and powerful

Fig. 18.

enemies of the country of the deceased. Inasmuch as this symbol is found in connexion with the dead, we think it may fairly be contrasted with that more spiritual and Christian metaphor, signified by the figure of a lion at the foot of the effigy of the dead man, in so many ancient and mediæval Christian monuments, emblematic of victory over the great enemy of mankind, who



is compared to a roaring lion. (1 Pet. v. 8.)

J. B.

PARABLES BY AGNES FRANZ.

THE father of Agnes Franz was *Regierungs-Rath* (Government-Councillor), at Miltitz in Silesia, where she was born in 1794. Hers was one of those seemly lives of noble self-sacrifice, which we know so well to admire—so little to imitate. Devoted first to the care of her widowed mother, afterwards to her sisters' children, who had been left friendless but for her friendliness, seeking not her own things but the things of others, doing good according to her opportunity, and finding time to write her pleasant imaginings for our sakes also, she led her quiet and peaceable life manywheres; last and longest of all, in her cheerful upper room in Breslau, where, pictured by some friendly hand, we have had delightful glimpses of her in literary journals at calm, intellectual tea-parties, or playing with her adopted children round the tree at Christmas time: where, also, she died not long ago, to the grief of many who had learned to love her meek and quiet ways and working.

FROST-BLOSSOM.

“Dear father,” exclaimed little Maurice, as he stepped out of his bed-room, and the early morning light shone cheerily into the room, “look here, oh, look! Beautiful white flowers have blossomed on our windows, just as finely shaped and as prettily covered with silver dust as the auricula you brought us yesterday, only much more beautiful, for they glisten as if they were made of diamonds.”

“The winter will be doing the work of the spring,” said smiling the father; “but trust it not. It is only like a teacher who is content in his pupils with outward show and splendour.”

“Meanest thou then,” inquired the boy, “that these flowers are more perishable than yonder one? don’t they hang there on the window as fast as if a skilful hand had sewed them in? It seems to me as if they would long outlast the poor auricula, for it has drawn together its calyx so disconsolately, as if it thought itself dying, while these crystal twigs are expanding ever larger and lovelier.”

“Only let the sun rise a little higher,” answered the father, “and then thou wilt learn to distinguish between reality and semblance.”

And when full day now began to gild the chamber, and the sunbeams touched the white flowers on the window, then they disappeared the one after the other; but the little auricula raised its velvety head to meet the warm sun’s kiss, and speedily the fragrant calyx opened, displaying to the wondering boy the golden flower, and breathing on him with the breath of the spring.

“Alas, for the deceitful winter!” cried Maurice. “Henceforward I will tend the more carefully the little, modest auricula, and trust alone the fair, odorous spring-flowers.”

“Knowest thou not, also, that the winter hath a lesson to give thee?” said the father. “Behold! delusions there are in plenty around us, and not the winter alone deceives us, but men, too, seek to delude by a false appearance and an empty show. There are many smooth words and much brilliant discourse current which may easily deceive a well-meaning heart, because it thinks to recognise therein the existence of love. But these, too, like the crystal flowers, are often merely the fruit of the frost, lacking altogether in life. A single testing ray of truth and they vanish into their own nothingness. But the noble heart is like the flower which unfolds ever and ever lovelier in the sunshine; its value can only become the greater to us the more the

heavenly light enlightens our eyes. Oh, that thou mayst early learn to distinguish between the truth and the show, and flee those vain delusions which entice, indeed, but can never satisfy or enduringly bless the heart !”

So spake the father. But Maurice, in a quiet heart, laid up and pondered the lesson.

THE GRAIN OF CORN.

“See here, father,” exclaimed Conrad, pointing to six heavy ears of corn which had all grown from a single grain, “see what an abundant blessing one little corn grain may have ! We take little thought of it, but walk by with heedless tread, and every grain is a rich gift of God, in which a whole harvest is enclosed.”

“So it is, my son,” replied the father. “God hath bestowed on all that is good and profitable an especial blessing. He walks invisible through our fields, and causes the young sown crop to prosper, so that bread may never be lacking to the diligent man. And as He cares for our bodily needs, so hath He his eye directed with double care upon the soul—the much more important part of man. Also for this there is a grain of seed which may bring forth fruit an hundred-fold. It is the Living Word that comes from above, and was given to men in order to spread even further the kingdom of Love and Truth. Oh, my son, a single word of God’s honour, spoken in the might of faith—a single deed of love done in His Spirit, may be likened to that seed-corn, and go on increasing ever in fruitfulness from generation to generation. Happy he to whom it is given to strew the golden grains of the Spirit, the costly seed of noble doctrine ! He may either see the fruits thereof here below or no—in secret, also, doth the heavenly blessing unfold itself. But one day all shall be made manifest, and then shall it wave to meet Him—the golden harvest of

which He sowed the seed, and angels shall bring home the sheaves, and God Himself shall rejoice over His wealthy autumn."

"Oh, father," cried Conrad, "thou hast said I should be a farmer and learn to cultivate the field. Oh, that I were also a sower after a spiritual sort, for more dearly than all might I call those sheaves mine on which the Heavenly Father looks down so well pleased."

THE LAST COMFORT.

The active and virtuous Almanzor saw the evening of his days coming on. Faithfully and honestly he had bestowed the years that the Lord had given him in doing good to his fellows,—had shared his possessions with the poor, and had sought to serve his brethren at the sacrifice of his own advantage. From his youth he had kept a day-book, in which he had registered every silent victory over himself, and every blessed deed of his life. He only and God knew what was therein, and he thought, "When once my life's sun is sinking, and all the joys and hopes of existence are growing dim and pale, then shall the memory of these hours arise over me like a comforting moonshine, to beam in peacefulness over the terror of the night of death into the darkness of the breaking eye, and to light me softly over into the field of heaven."

So thought Almanzor, and with secret satisfaction looked upon the book. Every page of it discovered to his soul an immortal joy, for everywhere his eye fell upon doings of charity and on the thanks and the blessing of those whom he had comforted or saved.

And it befell that the noble old man, visited by dangerous disease, sank upon the sick-bed. The pain to his members grew from day to day, and his soul was sorrowful. He felt

that his hour was approaching and began to prepare himself for death. Life grew dim before him like a colourless picture, and all that had given him joy before seemed to him a worthless shadow.

And his friends came to him and took thought how they might cheer his soul. And they told him of the thriving of his plantations,—of the blessing that was on his crops,—of the new increase of his goods. But he turned his face from them, and the pains in his limbs grew worse, and his breast heaved in restless struggle, and he longed for relief.

Then his daughters came, and they prepared for him a precious draught. And they brought him wine and costly fruit; but soon as the invalid had brought the refreshment to his lips he shook his head mournfully, and turned away his countenance and sighed.

Then one of his sons bethought him of the day-book, of which he had once heard his father say, that it contained quickening and comfort for the last hours of life. And he sat down by the bedside, and, with a soft voice, began to read from it. But his friends stood in deep emotion around, and folded their hands as the secrets of that noblest soul became known to them, and as they looked into the heart of the dying, now, for the first time, laid open in all its nobleness before them. But Almanzor turned his countenance aside, more troubled than before, and a cold sweat covered his forehead, and his eye wandered about in the circle as if painfully seeking for somewhat.

Then sounding across from afar it came like a trumpet-clang, and a solemn music came moving nearer and nearer. With a triumphant sound did the words of the hymn, "Jesus, Thou art my confidence," pierce into the soul of the sufferer. And the form of Almanzor raised itself once more. A joyful brightness flew across the sunken features, and he received with upraised hands the cheering sound and lis-

tened, blissfully refreshed, till the tones of the hymn became undistinguishable in the distance.

Then a holy shudder passed through the assembled circle, and they sank upon their knees and bent down sighing over the hands of the seeming-glorified one.

But he looked on them and spake, "Why weep ye? Has my thirsty soul not found that it was longing after? I sought it first by myself in the feeble testimonies of my own faithfulness. But there is one comfort only in the hour of death—only one balm for the breaking heart. Praised be God that my soul hath found it!"

And in deep devotion he folded his hands over the laboriously breathing breast. And the hymn came yet sounding afar like the assurance of eternal life, and the evening sun poured down its departing light and sank gently to its rest.

Almanzor also bent his head, and the hymn became silent. The Angel of Death had carried the praying soul to its home.

THE LESSON OF THE FLOWERS.

"Whence comest thou, so solitary and so sad?" asked Emilius of his friend Albano, who, with an expression of deep and painful seriousness, was stepping forth from amid the churchyard cypresses.

"I have been laying in the earth a grain of seed," the other answered;—"a noble lovely seed;—grain holding within it a wealth of brave hopes. It is Elvira, my little daughter, whom I have been burying. I thought I might in the course of the years have had the pleasure of seeing her mind expand and blossom; but the Lord hath otherwise resolved. He has deferred my hope till that morning, when His mighty word, 'Let it be,' shall sound anew, and the bloom of an unfading life shall awake out of the mysterious seed of the graves."

“Ah, my friend,” replied Emilius, “may these goodly hopes, wherewith thou seekest to soothe the longing heart, never forsake thee! It is so natural to hope for a visible reviving of those we love, that I can easily comprehend how one so willingly surrenders oneself to the pleasant dream.”

“Thou namest it, then, a dream, what to us Christians is a holy, well-warranted verity?” asked Albano.

“Do not think,” answered Emilius, “that I am of those who disbelieve in a spiritual immortality. No, on the contrary, my whole life would be planless, if I could not suppose that it was ripening toward a higher development. But do not imagine that I must also attach my hopes to the perishable dust of our bodies, which is given back to its original clay. The conception that I form to myself is much too exalted to unite itself with the mean clod that composes man’s perishable remains.”

Albano looked on his friend with a look of marvel, for he believed in the promise of the Lord and in *His* sensible resurrection; but as he met the cold smile of the understanding on the face of Emilius, he remained sorrowfully silent, and they walked along beside one another, each sunk in his own meditations.

They were now arrived in Albano’s garden, and he, in a friendly manner, asked his companion to sit down with him under an arbour. The sun was just hastening to his setting, and the rich, various-coloured flower-beds which they could see from where they sat, gleamed in the golden reflexion of the heavenly light. Then Ottilia, Albano’s youngest daughter, came gleesomely skipping past. She carried a large full-blown poppy in her hand and called out to her father: “See here, dear papa, what has grown out of the small, unimportant-looking dust which you threw about that day in my garden. This noble flower, white as the snow, and edged with as perfect red as the roses of our garden, has blossomed from it. Is not that a wonder?”

Sure no one who had not seen it with his own eyes could believe it."

"Thou art right, my child," answered Albano; "we are everywhere encircled with mysteries. Blessed is he who believes without having seen." Then Emilius blushed and took hold of the flower, and looked down on it in silent thought.

"What a difference!" began Ottilia afresh; "the tiny little grain of poppy-seed that vanished without a trace in the earth, and this shining, beautiful flower! But, father," she continued, with animation, "whence come these manifold colours and the enamel of these leaves, when the earth consists only of dark dust, and the little grain of seed of nothing better?"

"That is also a divine mystery which no human eye may read into," replied the father. "Every flower is a herald of Almightyness,—a messenger full of the blisfullest hopes, and, therefore, it is that sorrow so willingly adorns the graves with flowers, because every one of them is an expounder of the comfortable doctrine of the rising to a new life after death's dark night."

"Oh, come, my father, I will plant this flower on Elvira's grave," said Ottilia. "I know now that God is Almighty, and that in His own time He will also raise again my loved little sister, and clothe her with heavenly beauties."

Then Albano looked on his friend, and he met his eye as he turned it away to hide a tear. And now Emilius arose and laid his hand on Ottilia's head, and spake, "Oh, how near heaven stands to the childlike heart! 'Blessed is he who has not seen and yet has believed.'" W. H.

OURSELVES.

THE BLOOD.

THE small size of the Thoracic duct (for, as was noticed before, it is about as large as a small straw), only allows the Lymph to be yielded, or, as it were, distilled, drop by drop, into the blood. As this occurs just immediately before the blood passes into the heart, each portion, each drop almost, becomes mixed up with the general mass before a succeeding one is introduced. Several hours elapse before the Colourless Lymph Capsules lose their identity. Their proportionate numbers, too, vary both with relation to the taking of food, and to different states of the system. Eleven hours after a meal, blood taken from a vein was found to contain 5·1 Colourless Capsules to 2000 coloured ones: while three hours after a good mid-day meal, the numbers had risen to 6·2. Any tendency to inflammation, among other unhealthy conditions, checks the change into red blood.

After the Chyle has been absorbed into the lacteals, and before it reaches the circulation, it becomes considerably altered. While passing, as it does, very slowly, through the coils of the tubes, of which the Mesenteric glands chiefly consist, it becomes inspissated, and assimilated to the blood in specific gravity, in capability of coagulation, and in almost all other particulars, excepting colour. It may, therefore, be considered as *Embryo blood*. Where and when its final change takes place, and how it is matured into red blood, Physiologists are unable to determine: nor have they ascertained, with anything like precision, the quantity furnished in a given time. Some indirect experiments suggest

that, in a healthy adult man, under ordinary circumstances, from $4\frac{1}{2}$ to 7 pounds are supplied in twenty-four hours. In this way the blood becomes continually enriched, and the "waste by life" obviated.

If a portion of blood be taken from a vein, received into a basin, and allowed to cool, it soon coagulates. After a time, a thin straw-coloured fluid, called *Serum*, exudes, little by little, from the Coagulum, leaving the mass a good deal denser. This denser mass is termed the *Crassamentum*.

If carefully agitated in water, it readily separates into two parts, into the *Cruor*, or colouring portion, which consists almost entirely of red globules; and a plastic fibrous lymph called *Fibrine*.

We have thus obtained the three principal constituents of blood,—the Serum, the Cruor, and the Fibrine. Their relative proportions vary a good deal: they differ with age, temperament, states of health, quality and quantity of the food, &c. &c. Commonly, from 78 to 80 per cent are fluid. Of the Solid Residuum about 14 parts are blood corpuscles; 6 to 7, albumen; .2, fibrine; .2, fat; .7, saline ingredients.

Besides pure albumen, the *Serum* contains some serogelatinous material, amounting to $1\frac{1}{2}$ per cent. In it, too, are dissolved the saline ingredients of the blood. Berzelius found free soda: muriate, lactate, and phosphate of soda: muriate of potass: and the elements of phosphate of lime, magnesia, and iron, in varying quantities.

The *Cruor* consists almost entirely of red corpuscles. Their shape has been a good deal disputed: and it is still undetermined whether they are circular discs or spherical globules. Their size is almost always uniform. A human blood corpuscle averages the 3560th of an inch in diameter; a horse's, the 4720th; a dog's, the 3330th; a cat's, the

4400th; a pig's, the 4220th; a cow's, the 4320th; a sheep's, the 5310th; a goat's, the 6350th.*

Their colour appears to be rather an adventitious than an essential ingredient of the corpuscles. Dr. Young found, that by treating a piece of flesh in water, the globules of the blood which it contained, subsided to the bottom of the vessel, and could be readily collected, free from colour, while the colouring-matter became diffused through the water. By most chemists the colour is thought to be produced by some salt of Iron.

The thread-like character of the *Fibrine* has caused it to be so named. It is the most highly animalised of all the blood's ingredients: from it the muscles and other membranous textures of the body are formed.

These are the staple articles of the Blood. In them are found the rudiments of all the structures of which the whole frame consists. To supply all the ordinary and extraordinary requirements, all the local and general needs of the system, they become combined and modified, or separated and simplified. Now a tear is wanted; and there a splice of bone to mend a fracture. A little saliva is needed to render some food sapid; and then the Gastric juice, which subdues and digests it. Fuel for the fire, which warms, and moisture for the exhaling vapour, which keeps us cool. In fact, the blood conveys the materials of our being, and of our wellbeing, to every part. It is Life's circulating medium. To preserve it from waste, and to diffuse it readily over the whole fabric, it is secured in, and conveyed by, a system of vessels called the *Vascular System*, which consists of *Arteries* and *Veins*, having the *Heart* for a common centre.

P. S.

* These proportions become sometimes important in "Criminal Cases;" when it is desirable to ascertain whether spots or stains are of human blood or not.

CANDLES AND LAMPS.

The History.—The early history of the methods employed for purposes of illumination is involved in some obscurity, and it is doubtful whether candles or lamps, or both, were used by the ancient Hebrews. Frequent mention is made in the Scriptures of both candles and lamps, but it is difficult now to know whether the Hebrew term translated *candle* is correct, or really means *lamp*; for, in Leviticus, *lamps* in which olive oil was burnt were ordered to be placed upon *candle*-sticks, which Moses was commanded to make for the Tabernacle, after the model shown him in the Mount, as described in Exodus. Torches, which may be regarded as a rude substitute for candles, appear to have been employed at a very early date. They are mentioned as being used by the band of men and officers from the chief priests and Pharisees.

Candles made of wax (*cereæ*), or tallow (*sebacea*), were in general used among the Romans before the invention of lamps. Ultimately the *candelæ* were only used by the poor, lamps having taken their place in the mansions of the wealthy. Pliny gives us at best only imperfect accounts of these things, and nowhere any description of the materials of which candles were made, although describing the method of bleaching wax. He says they used for a wick the pith of a kind of rush called *scirpus*, and incidentally alludes to the use of flax for the same purpose.

We learn from Fosbrooke that, following the ancients, wax was employed in the middle ages as a material for candles, which were made of various sizes in moulds, the wick being formed of twisted tow; and we all know that

King Alfred marked the *hours of the day by the burning of his wax-candles*. In Beckman's "History of Inventions" we find a notice that Constantine caused the whole city of Constantinople to be illuminated with lamps and *wax-candles* on Christmas-eve.

The trade of wax-chandler was general in this country in the sixteenth century, for the manufacture of tapers both for religious rites and for preserving the bodies of the great, which was called "cering." Gilbert White, in his "Natural History of Selborne," minutely describes the method of covering rushes with tallow. We are indebted to a valuable modern work for an abstract of this process, which we introduce as the first reliable account we have of the manufacture of candles:—"A pound of rushes (*Juncus effusus*), containing 1600 individuals, was coated with six pounds of tallow, so that 228 lights weighed one pound, and cost a little over fivepence. The rushes were peeled on three sides for the best lights, and on two only for watch-lights, which were not required to give so much light, and which Gilbert White says, 'it is true, only shed a dismal one—darkness visible.'" Of the other kind he says, "that a good one, which measured two feet four and a half inches in length, burned fifty-seven minutes."

The first specification of any improvement to make candles in this country dates from 1799. William Bolts subjected the material tallow and other animal fats to pressure, which was, in fact, in some measure anticipating our stearine. He also described a solid candle, with a short wick, which was placed in a holder, and maintained in its position on the end of the candle by the pressure of a spring—a plan which has been revived and carried into practice in our own day in Palmer's candle-lamps.

The history of subsequent improvements will be found more appropriately detailed in the description of the various

processes and machines, which our readers will find in the following pages.

General Principles.— We will now just glance at the general principles involved in the *production of light*, by way of preface to one or two contributions on this subject.

Those bodies which are *not volatile* become luminous when exposed to a high heat; but this property varies very much with the chemical and physical character of the body—for example, the same degree of heat which causes *iron* to emit a *vivid white light*, will only render some *gaseous* bodies *visibly incandescent*. We have thus advanced a step, and find that *density*, as well as *temperature*, is essential to the production of artificial light, and that purely gaseous matter cannot be depended upon as a source of light, unless some solid particles are raised to a state of incandescence by heat evolved during their combustion. The conditions, therefore, for this object comprise a substance, or substances, undergoing combustion, or some electrical change which generates *heat*, which being communicated to some solid body, renders it incandescent, or capable of evolving *light*. All the different plans of obtaining artificial light in common use involve the employment of some substance which, during the process of combustion, evolves a solid body—*carbon*—which is heated to incandescence *before being consumed*, and which is shown in a very remarkable manner in a little apparatus invented by Mr. Goddard, of Ipswich.

But we must limit this broad statement; for of many bodies fulfilling the above conditions very few are adapted for general use, for various reasons. Thus, phosphorus and zinc burn with a brilliant light—the acid of the former, and the oxide of the latter, remaining for a few moments within the sphere of combustion, and becoming incandescent; but as both these products are *not volatile*, they

are deposited near the flame, being both injurious and troublesome.

Hence, for general use, another condition is essential, that the *products of combustion* should be *volatile*, and thus, in the flames of coal-gas, lamps, and candles, the *carbon*, which is the *source* of the light by its incandescence in a *solid form*, ultimately passes off as *carbonic acid gas*. When carburetted hydrogen, the principal gaseous compound of coal-gas, is ignited in the air, the two constituents of which it is composed do not combine with the oxygen at the *same moment*. The *hydrogen* is *first burnt*, producing a faint blue light, accompanied by intense heat, which causes the other *nascent* constituent, the *carbon*, to become incandescent, and therefore luminous. This incandescent floating carbon is carried to the outside of the flame where the oxygen converts it into carbonic acid, while another portion of solid carbon immediately replaces that consumed, and thus continues a *supply of light*. A simple experiment speaks the truth of this explanation, for if chlorine be substituted in the place of oxygen, the first act of the process only is performed, the hydrogen burning so to produce *hydrochloric acid* instead of *water*, while the *carbon* is deposited as *soot*. Therefore those gases or vapours which contain the most carbon will yield the most light.

Now let us see how these principles apply to the flame of a candle. It is obvious that no substance can be employed which leaves a solid residue on distillation; and this at once suggests a distinction between gas illumination and other sources of artificial light. In the solid and liquid fats, which are all volatile, on the contrary, the heat produced by the combustion of the gases they evolve in giving light is employed to keep up the process of distillation. Thus, in a lighted candle, the fat below the flame is melted into the form of a hollow cup containing liquid fat, by the heat

radiated downwards from the flame. This reservoir of liquid fat is the source whence the wick draws its supply, which is constantly renewed during the combustion of the candle.

The fluid fat rises to the region of combustion by *capillary attraction*, the interstices between the fibres of the wick forming a number of minute or *capillary* cylindrical spaces. The fat is not immediately consumed, but undergoes a process of dry distillation, the flame which envelopes the gaseous matter protecting it from the surrounding atmosphere. A dark central cone, in contact with the wick, is filled with carbo-hydrogens, the gaseous product of the action of the heat on the liquid fat, and which may be drawn off by means of a thin glass tube open at both ends, and actually ignited as they issue at the outer end. A white zone of flame surrounds this dark region, where the gases produced in the central cone come in contact with the air, and whence, in fact, all the light of the candle is derived. The hydrogen first combines with the oxygen, generating intense heat, while the carbon, for the simultaneous combustion of which there is an insufficient supply of air, becomes incandescent, and thus produces light. The luminous portion of the flame, lastly, is surrounded by an almost invisible envelope, where the whole of the carbon is finally converted into carbonic acid gas.

We now turn to

The materials, and their preparation.—There are several substances which are chemically adapted for the production of light, but commercial considerations have limited the supply to coal, resin, tallow, spermaceti, wax, and some of the fat and volatile oils of animal and vegetable origin.

The Fats are found very generally diffused through nature, and play a very important part in domestic economy,

being largely consumed as food, indispensable in the manufacture of soap, and admirably adapted for the production of light. The chief source of supply is in the organised structures of plants and animals, but the economical production of paraffin from coals by Young, and the conversion of *sugar* into the fatty *butyric* acid by a fermentative process with the aid of cheese by Pelouze, suggests the possibility that chemistry, in its rapid progress, may at last discover some method for the artificial preparation of these important bodies. They, of course, are of most value as articles of food: and are never employed for the production of light, nor the manufacture of soap, except when in superabundance, or in some form which is unpalatable. The large proportion of carbon (70 to 80) which they contain renders them peculiarly suitable for food and light, and, in truth, distinguishes them from most other bodies. In their natural state they are not homogeneous substances, but mixtures of several different bodies: some are solid at ordinary temperatures, as *stearine* (στεινῆ, tallow), others fluid even at 32° Fahr. as *oleine* (έλαιον, oil), and of course those which contain the largest proportion of the former require a higher temperature for melting. The different varieties of *tallow* are solid, the *oils* liquid, and intermediate are found all the kinds of *grease*, which, strange to say, have not yet been employed for lighting purposes, as no plan has been found adapted to their natural condition.

The following table shows the ultimate composition of some of the common oils, fats, &c., employed for giving light in their crude state:—

Name of Oil.	Carbon.	Hydrogen.	Oxygen.
Olive oil	77·21	13·36	9·43
Train oil	76·13	12·40	11·50
Sperm oil	78·90	10·97	10·13
Spermaceti	81·60	12·80	5·60
Bees-wax	81·80	12·67	5·54
Animal tallow	78·10	11·70	9·30
Stearine	78·74	12·39	8·87
Oleine	78·57	11·45	9·98
Palmatine	76·36	12·00	11·64
Resin	79·27	10·15	10·58
Oil of turpentine	84·60	11·73	3·67
Paraffine	85·22	14·78	3·67
Olefiant gas	85·22	14·78	3·67

And the next table shows the relative proportion of the solid and liquid constituents of some of the fatty bodies :

100 parts yielded	Fluid.	Solid.
Fresh butter, in summer	60	40
„ „ in winter	37	63
Hog's lard	62	38
Ox marrow	24	76
Mutton suet	26	74
Olive oil	72	28
Palm oil	69	31

Nearly all the fatty bodies employed for purposes of illumination are *fixed*, that is, they do not *evaporate* like the volatile oils, nor can they be strongly heated without

decomposition, the basic ingredient *glycerine* in its conversion into *acroleine* giving rise to those pungent irritating vapours which accompany the boiling of oil.

The action of oxygen again divides them into two other classes, some becoming *rancid*, and others being converted into *resins*.

The strong mineral acids either convert them into new bodies or enter into combination with them, upon which latter reaction depends the modern stearic candle manufacture.

The strong alkalis and lime decompose the fats, combining with the fatty acid and liberating the glycerine, being analogous, for example, to the action of lime on carbonate of soda, when the former takes the carbonic acid of the latter and becomes insoluble, while the soda remains, like the glycerine, in solution. This reaction forms the basis of the manufacture of soap, and is now extensively employed for separating the fatty acids in making candles.

The more expensive fat oils of commerce are often adulterated with cheaper oils and the detection of these fraudulent mixtures is attended with great difficulty.

The vegetable fats and oils are most abundant in the fruits, particularly in the seeds of plants, and we will select a few of the more important for description. T. R.

(To be continued.)

REVIEW OF THE MONTH.

THE last few weeks have removed many names of note from the land of the living: Mr. Gilbert A'Beckett, the

author of "The Comic History of England;" Mr. Yarrell, whose delightful works on British Birds and British Fishes have long been among the choicest treasures of the English naturalist; Sir John Ross, the Arctic navigator, whose sea-faring life commenced seventy years ago; Sir Richard Westmacott, the pupil of Canova, and the sculptor of so many well-known statues; Sir William Temple, the venerable diplomatist, and one of the last representatives of a historic line; and Mrs. Schimmelpenninck, whose "Memoirs of Port Royal" brought many English readers first acquainted with a remarkable phasis of French and Romanist piety.

Now that the war is ended, it is to be hoped that some "peaceful fruits" may spring up among the nations engaged. The Sultan has proclaimed complete religious liberty to all his subjects; consequently, it is no longer a capital crime to renounce Mahometanism, and the door is open to preach the Gospel to the twenty millions of Moslems in Turkey. Of this opportunity the first to take advantage is the religious society known as the Countess of Huntingdon's Connexion, which is preparing to send out a missionary. But at the outset there will be need for wisdom, as well as zeal: The edict of toleration is a concession of the Sultan to his Allies; it is contrary to the Koran; it is far in advance of the spirit of the people, and in the face of the prevailing fanaticism it will need the utmost firmness on the part of the Government to carry it into execution. Meanwhile, the operations of the American missionaries among the nominal Christians of Turkey proceed with unabated vigour and increasing success.—By a route not a little remarkable the Bible is entering Italy. Eighteen thousand copies of the Scriptures have gone to Sardinia from the Crimea. The avidity with which the Piedmontese soldiery have sought the Word of God is full of promise as

regards its results in future. On the first day of his arrival at the Sardinian hospital at Yenikoi, Mr. Duncan Matheson, the chief agent in the distribution, was visited by seven hundred officers and men, eager for a copy; and several instances came to light where, through copies previously dispersed, the eyes of earnest readers had been opened to the great truths of the Gospel.—What benefits may accrue to France herself it is not so easy to prognosticate; but, it is to be feared, there is yet little faith in that land. Father Valery, a Jesuit, has lately published a pamphlet, giving a sad view of the prevailing irreligion, and his statistics are not the less significant because his standard is Romanist. According to his estimate, in the large towns not one man in twenty ever comes to the communion; and although the state of the female population is more satisfactory, even of these many have learned to doubt regarding the infallibility of the Church, indulgences, purgatory, &c., and to express opinions which can scarcely be distinguished from infidelity or—Protestantism!

In the year 1854, through the tact and energy of Commodore Perry, the government of the United States succeeded in forming a commercial treaty with the empire of Japan, which promises to open its islands to the trade of the world. A Narrative of Commodore Perry's Expedition has just been published, and a more curious and entertaining book of voyages has not appeared since the days of Captain Cook. The opportunities of observation enjoyed by the American explorers were unique, and, with the aid of a clever draughtsman, they have been turned to the best account. Besides, the pen of Dr. Hawks has given a charm to the recital which is often wanting in the rough jottings of the naval log-book.



The old Dog barks.

JACOB CATS AND HIS EMBLEMS.

JACOB CATS was born at Brouwershaven, in Zeeland, in 1577. He studied law first at Leyden, and then at Orleans, and, as an advocate in the courts of the Netherlands, he obtained great and early distinction by his successful management of some cases which he was called to conduct. His "alma mater," Leyden, offered him a chair of jurisprudence, but he preferred the career of statesmanship; and by the great ability, and still greater integrity, which he devoted to the service of his country, he gained golden opinions from all his fellow-citizens, till in the year 1636 a unanimous vote called him to the highest post of honour as grand-pensionary, or prime-minister, of Holland. This office he held in the fear of God and for his country's welfare, till the year 1651. He then, after the opening of the States-General, abdicated, and, having obtained his discharge, he dropped upon his knees in the midst of the assembly, and returned thanks to the Most High for the help he had received in the long and difficult, but distinguished career which that moment completed. It was an affecting spectacle,—the old man of seventy-four, with reputation so unsullied, and so universally beloved, retiring from the administration of one of the most powerful governments then existing, and in the fulness of his heart, and with all simplicity and godly sincerity, in the presence of his fellow-citizens and senators, making this public, but unostentatious acknowledgment to Him who had so often been a present help in time of trouble.

From public life he retired to his country-seat at Zorgvliet, near the Hague, where he passed his time in reading

his Bible, and inditing such poems as "The Octogenarian's Retrospect," and in cheerful converse with his friends, and where he died September 12, 1660.*

Cats paid three visits to England in his time: the first when he was a young man, suffering from a lingering ague or fever, and when he hoped in vain to be cured by Queen Elizabeth's famed physician, Dr. Butler. The next time was as ambassador in 1627, when he was knighted by Charles I., so that we of this country ought to call him Sir James Cats. His last visit was immediately after his resignation of the office of grand-pensionary,—an embassy, which, however, did not prevent the breaking out of a miserable war between the two great Protestant republics of England and Holland.

The calling of Jacob Cats was law, statesmanship, diplomacy: but his passion was for poetry. Like a dear wife whose quiet words are the evening's solace, and for a day of whose undisturbed society it is worth while to work hard a month, he was wedded to the Muse, and was a true lover to the last. His favourite vein was Christian ethics, including most especially the practical, every-day virtues; and the form in which he chiefly gave forth his "good matter" was allegories, emblems, apologues. In this line of literature he was apparently inexhaustible, and we are disposed to think he is unrivalled in any language. With a lively fancy he had a wonderful knowledge of human nature. As a lawyer, a minister of state, a traveller, above all as a Christian who communed with his own heart, he had rare opportunities of observing, and what would have made a

* "L'Histoire de la Litterature Néerlandaise," par Gravenweert. "Biographie Universelle," tom. vii. Zedler's "Lexicon," band 5. "Penny Cyclopædia." It is hardly creditable to our biographical dictionaries, and most of our Encyclopædias, that they contain no notice of the most popular author in the Netherlands.

worldling cynical, only made this warm-hearted old man the shrewdest of sages and the kindest of counsellors. After all, there is no eye so sharp as a pure heart, and no one sees better through other people's masques than he who wears none of his own.

To this day the works of "Father Cats" are household books in Holland. With their quaint pictures adorning every page, their amusing stories and captivating rhymes, they are favourites especially with youth and with the pious peasantry: so much so that they are sometimes called "The Young People's Bible;" and his meditations on "Matrimony" used to be a universal bridal present. It would be difficult to find another book combining so much original humour, lively description, and kind feeling, with so much good sense and so many of the maxims of heavenly wisdom.

Chiefly for the sake of the clever pictures with which they are adorned, volumes of Cats's Emblems are often found in the libraries of English collectors. The illustration which we have faithfully copied is taken from the "Spiegel van den Ouden ende Nieuwen Tijd," or "Mirror of the Old and New Time," 1635. It speaks pretty plainly for itself, and the letterpress speaks for it somewhat to the following effect:—

Though Birky bark the livelong night,
 I never mind the whelp;
 The merest mouse or wandering cat
 Sets up his idle yelp.

Old Watch again's a beast of sense,
 And when I hear him call,
 I know some rogue is at the hens,
 Or on the orchard wall.

Ev'n now I heard his honest growl,
 And, though the bed is warm,
 I must look out; for, take my word,
 It is no false alarm.

Stop thief! stop thief! young gallows-bird,
 I know you, neighbour Nat;
 Your sport is spoiled, and in the stocks
 You'll pay me tit for tat.

He's off: we're safe: I'm back to bed:
 But ere I fall asleep,
 Accept this hint:—Young hearts for deeds,
 Old heads for counsel keep.

Around all these emblems there is a garnish of proverbs and pungent sayings, gathered from the literature of many lands. For example, the one just quoted is followed by a polyglott of proverbs to the effect, "It is not for nothing that the old dog barks."

German.—"Wenn der alte Hund kläfft, so soll Mann aufsehen."

Italian.—"Cane vecchio non baia indarno."

French.—"Quand le vieil chien aboye, il donne conseil."

Spanish.—"El perro vieio si ladra da conseio."

Dutch.—"Met jonge te Krijgen, met oude te raden."

"Een oude Kat speelt met geen balleken."

Latin.—"Senum consilia, juvenum lanceæ."—*Erasmus*.

"Longiùs insidias curva videbit anus."—*Ovid*.

H.

MRS. SHERWOOD.

(*Concluded.*)

LIFE, in its various stages, has been compared to a series of dissolving views, in which one scene blends so gradually and imperceptibly into another, that it is often only by a strong effort of memory we can realise how entirely all around us is changed from what it used to be. Even so was it with the biography we have undertaken to trace.

The dull house at Bridgenorth was exchanged for military quarters, and the monotonous life of the "daughter at home," for all the bustle and excitement which attend a soldier's wife. We must not follow all these migrations, but cannot afford to pass over one incident related during their sojourn at Sunderland, for this will help us to form an estimate of the religious knowledge at that time possessed by Mrs. Sherwood. That she had an increasing tenderness of conscience, amounting occasionally to morbid scrupulousness, we cannot doubt from many passages in her previous life. She had formed for herself very strict rules, but evidently with a view to erect a foundation of self-righteousness; and it was only by a very gradual process that she was brought to say with the apostle, "Other foundation can no man lay than that is laid, which is Jesus Christ." Had religion been with her then, as it afterwards became, the "one thing needful," it could hardly have been left for a painful discovery after her marriage that her husband's views on the subject were altogether unsettled. While setting herself diligently to study the Word of God, he "calmly let her know that he was not quite convinced that the Bible was true, although he thought parts of it might

be so!" A painful discussion ensued, ending in his assurance that he would not interfere with her, and that she might do just as she pleased in religious matters. She honestly confesses that she did not behave well on the occasion, for anger, rather than sorrow, was stirred within her. Something of honest indignation was, perhaps, excusable, as he had not alluded to these differences during the period of their engagement, yet conscience must have whispered that this was not the time when such a discovery ought to be made. There were other subjects, too, which might well press heavily on any thoughtful mind, and which must frequently have weighed upon her spirits in the earlier portion of her married life. She informs us that the state of the 53d was then a disgrace to the army, and many a character then studied served hereafter to "point a moral" in her tales.

While the regiment was stationed at Morpeth, her husband being just made paymaster, she was called to rejoice over the birth of her first-born child, whose name combined that of both parents, Mary Henrietta. A double blessing seemed to rest upon her birth, for, says the happy mother, "Her father doubled my gratitude to God, by saying, in the moment of his thankfulness, that he would read the Bible to me every day. And from thenceforward this promise was kept." This much-loved daughter was spared to welcome them home after many years' wandering; but bitter was the pang of parting from her when, in all the dawning intelligence which makes a baby of eleven months old so winning, the 53d being ordered to the East Indies, the fond mother had to leave her treasure behind. The struggle seems to have been almost heart-breaking. Never were motherly instincts more strongly developed than in Mrs. Sherwood. Can we wonder, then, that in this particular point her heavenly Father saw fit to try her? One after

another of the lovely babies born to them in India was taken away, till she was well-nigh desolate. But "Who teacheth like Him?"

We must not attempt to describe the voyage, fraught with danger, and by no means destitute of startling incidents, but rejoin Mr. and Mrs. Sherwood in the land of their adoption. We are obliged to pass over the landing at Madras, the description of curious sights and novel sounds which meet a stranger on first arriving, and look in upon them when settled in their new home at Dinapore. And here we trace the beginnings of those important labours among the children of the regiment which formed so striking a feature in Mrs. Sherwood's future life, and for which no doubt the school-work at home had in some degree prepared her. She thoroughly loved children, and no others should attempt their training. But if patience is always needed for this work, surely "long patience must be exercised towards those in whom perpetual association with all that is degrading has strengthened the evil which is bound up in the heart of a child." A most valuable helper in these labours was found in Sergeant Clarke, who, though having somewhat military ideas of school discipline in the use of his cane, was nevertheless a hearty and right-minded man.

Their next station was Berhampore, "a region of miasma, a place of graves." Such is her short but expressive description. There is a deathly paleness there on every face, the very lips being colourless. Here her little Henry sickened and died, and very touching is the account of all she suffered in losing him; but God was teaching her the danger of that idolatry to which her fond heart clung, and deepening the lessons of Divine truth which she was receiving through the instrumentality of the good chaplain, Mr. Parson, who was, indeed, to her at this trying season "a son of consolation."

A companion for her remaining child, her little Lucy, was soon found in the person of a poor motherless babe whom she received and tended as her own. Perhaps there is no better proof that sorrow has brought a blessing with it than when it enlarges the heart of the sufferer with sympathy for others, instead of contracting it into a narrow selfishness. She remarks that her heart was so filled at that time with feelings of pity for little children, that she would have gone all lengths to serve them.

But we must pass on to the period when Mrs. Sherwood became associated with that little band of believers whose names will be treasured wherever the cause of missions to the heathen is loved as it deserves to be. What Christian heart does not kindle at the mention of such names as Henry Martyn and Daniel Corrie? We seem treading on holy ground while we are brought into intimate communion with men "of whom the world was not worthy." Henry Martyn's inner life has been laid open to the Christian public by his Journals and Letters in a way which has made us feel as if little could now be told which would enable us to know him better; but we should be very sorry to lose those finishing touches which a female hand has added to the portrait:—

"The instant we came to anchor at Dinapore Mr. Sherwood set out on foot to carry a letter which he had brought from Mr. Parson to Mr. Henry Martyn, who eventually became one of our dearest friends. . . . I perfectly remember the figure of that simple-hearted and holy young man, when he entered our budgerow. He was dressed in white, and looked very pale, which, however, was nothing singular in India; his hair, a light brown, was raised from his forehead, which was a remarkably fine one. His features were not regular, but the expression was so luminous, so intellectual, so affectionate, so beaming with Divine charity, that no one could have looked at his features, and thought of their shape or form,—the out-beaming of his soul would absorb the attention of every observer. There was a very decided air, too, of the gentleman about Mr. Martyn, and a perfection of manners which, from his extreme

attention to all minute civilities, might seem almost inconsistent with the general bent of his thoughts to the most serious subjects. He was as remarkable for ease as for cheerfulness."

He invited his new friends to stay with him, and what was wanting in outward accommodation, was made up to them in the delightful intercourse they enjoyed with him. "His house was destitute of every comfort, though he had multitudes of people about him. I had been troubled with a pain in my face, and there was not such a thing as a pillow in the house."

They were then on their way to Cawnpore, where they were enabled afterwards to receive him to more comfortable quarters ; and much he needed their tender sympathy.

"The mode of existence of an English family during the hot winds in India is so very unlike anything in Europe that I must not omit to describe it, with reference especially to my own situation then at Cawnpore. Every outer door of the house and every window is closed ; all the interior doors and venetians are, however, open, while most of the private apartments are shut in by drop curtains or screens of grass, looking like fine wire-work, partially covered with green silk. The hall, which never has any other than borrowed lights in any bungalow, is always in the centre of the house. . . . In the hot winds I always sat in the hall at Cawnpore. Though I was that year without any baby of my own (she had laid her cherished Lucy, too, in an Indian grave), I had my orphan, my little Annie, always by me. . . . During these mornings we heard no sounds but the monotonous click-click of the punkah, or the melancholy moaning of the burning blast without, with the splash and dripping of the water thrown over the tatties. On the 30th of May the Rev. Henry Martyn arrived at our bungalow. The former chaplain had proceeded to the Presidency, and we were so highly favoured as to have Mr. Martyn appointed in his place. It was in the morning, and we were situated as above described, the desert winds blowing like fire without, when we suddenly heard the quick steps of many bearers. Mr. Sherwood ran out to the leeward of the house, and exclaimed, 'Mr. Martyn !' The next moment I saw him leading in that excellent man, and saw our visitor, a moment afterwards, fall down in a fainting fit. He had travelled in a palanquin from Dinapore, and the first part of the way he moved only by

night. But between Cawnpore and Allahabad (230 miles) there is no resting-place, and he was compelled for two days and two nights to journey on in his palanquin, exposed to the raging heat of a fiery wind. He arrived, therefore, quite exhausted, and under the influence of fever. We had a couch set for him in the hall. There he was laid, and very ill he was for a day or two. When he got a little better he became very cheerful, and seemed quite happy with us all about him."

His love for children was a very marked feature in his character, and at this time the gentle orphan, Annie, often pleasantly beguiled him from those Hebrew studies which were becoming almost too absorbing. He was ever ready to lay aside his lexicons for the prattle of a little coaxing child, whom he alternately caressed and instructed. Why should the question force itself upon us,—“What might Henry Martyn have been, surrounded by those domestic ties for which his heart so yearned, but which were providentially denied him?” He has long since rested from his labours; he knows that every step of that weary pilgrimage was wisely ordered; that the desolate home, and the lonely death-bed, and the unhonoured grave, his “evil things,” were but preparations for those mansions in Heaven, where “Christ is all and in all.” Oh! may men, like-minded with him, be raised up to carry on that glorious work for which he lived and died!

We have been tempted into so long a digression, that we must devote only a few words to his fellow-labourer, Daniel Corrie (afterwards Bishop of Madras). Humble, courteous, tender-hearted, benevolent, even playful occasionally, he won the love of all with whom he conversed, and truly “pleased his neighbour for his good, to edification.” When will Christians generally learn to keep this great rule constantly in view? Too often we are contented to please without edifying, or we try to edify without pleasing. The truth is that we think of self more than of our Master.

Mrs. Sherwood's own efforts among her scholars were surprising, when we consider that delicate health and repeated domestic bereavements were added to the enervating effects of an Indian climate. She thus describes her daily employments :—

“ We worked very hard with the children. I generally heard four classes : one of great boys, another of the elder girls, and two classes of the younger children. Many of the first set, having been brought from Europe, died before we left India ; some of the older girls also died, and some married. Many married officers above their own birth, and some proved their affection to me in after-life.”

She was also engaged, during a great part of this time in literary labours—indeed they almost necessarily sprang out of her educational schemes.

“ Having finished the ‘ Indian Pilgrim,’ I began to write my ‘ Church Catechism ’ for the use of my school, for I had a little before been thoroughly perplexed by finding that the children could not understand any common English narrative without asking many questions ;— for instance, one said, ‘ What is a barn ? ’ another, ‘ Do they walk out at noon without a chatta ? Are they not afraid of serpents in the grass ? ’ This was rather too much ; and what could I do but write for them myself ? And with this idea I began the ‘ Church Catechism,’ making use of any tale or conversation from the barracks which I might chance to hear.”

This useful Cawnpore life was for a season interrupted by an expedition to Calcutta, preparatory to a projected voyage to England, which Mrs. Sherwood was induced to contemplate, in the hope of rescuing her infant from an early grave. This involved many painful partings ; but her chief anxiety—the well-being of her two beloved orphan charges—was happily relieved by the adoption of Annie Childe into the family of Mr. and Miss Corrie, who treated her with almost parental love, and a similar offer from a lady at Benares provided for the other. These

plans, however, were most unexpectedly frustrated, for, on arriving at Calcutta, and seeking further medical advice, it was decided, to the great relief of both parents, that with judicious care there was no reason their child should not be reared in India ; and thus, after a most refreshing sojourn among that devoted little band of fellow-Christians, whom the Rev. David Browne gathered round him, they thankfully set forth in their budgerow to return to their beloved Cawnpore.

Those who have traced her history thus far will scarcely be prepared for Mrs. Sherwood's repeated assurance that she was all this time under very mistaken, or rather very inadequate, views of religious truth. We cannot think so ; "a good tree cannot bring forth evil fruit," and surely all she has told us of her life and labours proves that hers was no less a "work of faith" than a "labour of love." It is painful to find her speaking with something like compassion for what she considers a similar deficiency in Henry Martyn ; but her writings will best explain in what respects her views became altered.

We pass over the few succeeding years, varied by different regimental movements, which occasionally involved the necessity for Mr. Sherwood's prolonged absence from home, during which the energy and firmness of his wife's mind, and her happy power of adapting herself to circumstances, were fully developed. The management of an Indian household can be no easy matter to accomplish, and in this case were added the care of many helpless orphans, and all the difficulties attending the maintenance of Divine worship after the chaplain's removal.

It was time to seek the refreshment of a visit to England, where Mrs. Sherwood's mother was still living in advanced age, and, obtaining leave of absence for one year, the paymastership of the regiment, which Mr. Sherwood had held

for twenty years, was resigned into other hands, and the whole party set sail for their native land. A fearful storm overtook them, of which we have the following record :—

“ For some hours we had nothing before us but death. I prayed most earnestly that, whether living or dying, our Saviour would be with us. I thank God that He made me more submissive to the thoughts of death, for myself and those I loved, than I had been during a former storm. I commended myself to the Lord Jehovah, and solemnly renounced for myself and children all pleas for mercy but through the merits of Christ my Saviour. I felt in those dread hours, with the saints of old, that nothing is precious, nothing desirable, but the Lord Jesus Christ.”

They landed at last in safety at Liverpool, and lost no time in travelling into Worcestershire, where the welcomes awaiting them from an aged mother and a grown-up daughter (parted from in so much anguish) must have made those many years of Indian life appear “ but as a dream when one awaketh.” It seems to have been a peculiar blessing that the last few months of Mrs. Butts’ declining life should have been so soothed and cheered. The still brighter light of clearer spiritual discernment was given too, and her end was emphatically “ peace.”

But now once more returned to an English home, could our authoress be idle? No; employment was to her active spirit a necessity, and, as usual, her love for young people directed the course her energies should take. She resolved on receiving some pupils to educate with her own children. Pecuniary considerations, in the first place, made it desirable; for their income was hardly equal to the expenses of their family, and Mr. Sherwood’s earnest desire to be separated from them no more, inclined him to think of selling his commission. They had now five children of their own, and two orphan girls to support, besides many *protégées* in India who had claims on them. Moreover, the style of living in the East was by no means a good preparation for economis-

ing in England ; but, perhaps, the chief reason after all was to be found in a very decided love for educational work. "I dearly loved the society of young persons," writes the warm-hearted teacher ; "I rejoiced in the numbers of cheerful faces around me. As Mr. Sherwood never put a check upon my making our house the asylum for motherless girls in India, so in England he let me do what I would."

But this was not the only part of her English life which was to be but the counterpart of that which had preceded it. Soon her youngest boy, her "little Benjamin," as she called him, was laid in the grave, which had received, but a short time before, one of the Indian orphans. It was a sore trial, and her spirits for a time seemed quite to give way ; but a little visit paid to the scenes of her husband's early life, and yet more, perhaps, the congenial influence of home duties and country pursuits, gradually restored her to cheerfulness ; and though this was not the last trial of the kind she was called to endure, she could at length thank God for her "five children in heaven."

Two very pleasing circumstances are recorded which beautifully illustrate the promise we all so often need to sustain our sinking faith, "Cast thy bread upon the waters, and thou shalt find it after many days." An invitation from the major of the 53d took Mrs. Sherwood with her husband and children to Weedon barracks, where the regiment was then stationed.

"In passing through the hall I found it half filled with officers, and as many as eight members of the band, all waiting to see me. The youths stood together ; they were all full-grown, tall, military men, finely drawn up, and well acquainted with what was due from themselves to me. For an instant I knew not one of them, but soon I recognised in them the babes I had nursed, and dressed, and lulled to sleep, and the boys I had taught whilst yet scarce able to lisp their letters. . . . How gratified was I to hear the most favourable account of these boys ! . . . Such a minute is worth many, many petty annoyances."

Another incident of a similar kind awaited her some years afterwards on re-visiting Bridgenorth, when eight of her old Sunday scholars, now worn-looking women far advanced in life, received her with the warmest affection, and gave her most satisfactory accounts of all, save one, who had been under her instruction with them. It should encourage many a Sunday-school teacher to hear that after their teachers had been taken from them, the elder pupils made a practice of meeting together on Sunday evenings to pray for a blessing on the sisters, and that they might never forget the truths they had heard.

But years were increasing on Mrs. Sherwood, pupils were no longer necessary to her income, and she and her husband yielded to the wishes of their children, and prepared for a Continental tour. Of her intercourse with good Dr. Malan at Geneva she speaks in the warmest terms, believing him to have been the appointed instrument for guiding her into fuller views of Christian doctrine than she had hitherto attained. However this may be, none who have looked on his truly apostolic countenance, beaming with the love which is so peculiarly its characteristic, can doubt that her spirit was refreshed by communion with such a man. The services in his chapel, especially the hearty singing of his own elevating hymns, affected her deeply, as they have done many a worshipper before and since at the Pré l'Evêque, and we cannot doubt he was allowed to build her up on the right foundation.

But we have already far exceeded the limits we had prescribed for this little sketch of a life so varied in its outward aspect, that selection has been no easy task. "It is a difficult thing," it has been well said, "to grow old gracefully," yet here is an old age presented to us brightened by many a sunset hue. Hear one of the closing remarks in her somewhat lengthy diary. "Thus my lines are placed

in pleasant pastures, and days and months pass, and old age steals on so gently, that now, in my seventy-fourth year, I can read the smallest print, write four or five hours a-day, sleep with unbroken rest at night, and declare myself, with grateful heart, one of the very happiest old women that ever cumbered this earth." The very last entry is this:—
“*Written on the 23d of January, 1847, ‘Thou wilt keep him in perfect peace whose mind is stayed on Thee.’*” Then follow a few pages of mournful interest from the affectionate daughter who watched her declining years. Gradually the mother and child seemed to be changing places. The books which were to be their joint production became almost wholly the daughter’s task. It seemed as if every earthly tie were to be loosened that the soul might be free for its heavenward flight. Captain Sherwood, after a painful and distressing illness, was called to his rest ; and, chastened in spirit, yet with a heart fully alive to all the best interests of those around her, she waited meekly till the summons should come to join her many loved and lost ones in their Father’s home. Her dying bed was lovingly tended by her two remaining daughters, and her parting words must still echo sweetly in their hearts,—“Remember this, my children, that God is Love. He that dwelleth in love, dwelleth in God, and God in him.”

A.

LIFE, IN ITS HIGHER FORMS.

No. V. (*continued.*)

MAMMALIA.

A YEAR or two ago the great lion in the Zoological Gardens, which all London was running to see, was an uncouth, lanky, low-limbed creature, with extraordinary longitude of snout, and as conspicuous bushiness of tail. An ample apartment, duly indexed and labelled, as became the rarity of the tenant, was assigned to it, so that it could not only be well seen, but thoroughly examined. Its colours, sober brown and silvery grey, and its fine collar of black velvet edged with white, redeemed its odd figure from the character of vulgarity; but the manner in which it walked was something quite original. Its fore-legs were short, but very stout and muscular, and terminated in enormous claws, which were habitually bent in under the feet, so that the animal rested on their outer surfaces, pretty much in the same fashion (if we may use a homely simile familiar to Londoners), as your maid-of-all-work supports herself on her left knuckles, when she cleans the door-steps.

This was the Great Ant-bear (*Myrmecophaga jubata*), from South America, a harmless creature, notwithstanding its muscular strength. It feeds on ants, and on *termites*, or white ants, as they are called, whose great houses of cemented earth, that are so common in tropical forests, are torn to pieces by these great claws, that the swarming insects may be exposed and devoured. And this last operation is not less singular than other parts of the economy of this creature. Its mouth, long and tubular, is entirely destitute of teeth, but contains a tongue of great

length, ordinarily folded on itself, and capable of rapid protrusion to a long distance. When the termites crowd to the broken surface of their nest, as is their custom, the shrewd Ant-bear darts into the midst of them his long tongue covered with a glutinous secretion, and as swiftly draws it back into his mouth, densely covered with the adhering insects.

This curious animal is a fair representative of a group which includes the lowest forms of the true or placental Mammalia—the Class EDENTATA. As Australia is the great centre of the MARSUPIALIA, so South America is the home of the EDENTATA, of which the Sloths and the Armadillos are, after the example just described, the most important living members. But recent discoveries have exhumed from the soil of the same continent other and far more gigantic representatives of the Class, the Megatheriums and Mylodons, the vast bulk of whose bones indicates that their strength must have been as irresistible as their forms were colossal. Professor Owen, who built up, bone by bone, that noble “skeleton of an extinct gigantic Sloth,” that stands,—a monument of his skill and knowledge—in the Museum of the Royal College of Surgeons, has given some interesting deductions respecting its mode of life. He concludes that the *Mylodon*—a leaf-eater, like its modern cousins the Sloths of Brazil—having partly exposed the roots of a living tree, by means of its powerful front claws adapted for digging, was accustomed to rear itself up on the broad tripod formed by its own immense hind-feet and its strong tail, and embracing the trunk of the tree with its fore-feet, put forth all its mighty strength in striving to overthrow it. “The tree being thus partly undermined, and firmly grappled with the muscles of the body, the pelvis and the hind limbs, animated by the nervous influence of the unusually large

spinal cord, would combine their forces with those of the anterior members in the efforts at prostration. And now let us picture to ourselves the massive frame of the *Megatherium*, convulsed with the mighty wrestling, every vibrating fibre re-acting upon its bony attachment with a force which the strong and sharp crests and *apophyses* loudly bespeak : extraordinary must have been the strength and proportions of that tree, which, rocked to and fro, to right and left, in such an embrace, could long withstand the efforts of its ponderous assailant."

The populous Class of mostly small quadrupeds, known as *Rodentia*, or Gnawers—of which the Rabbit and the Rat are familiar examples—rise but little, in the scale of organisation, above the *Edentata*. They display but little intelligence, have few means of defence, are timid and feeble, and as they are the prey of many enemies, they are preserved from extermination only by their amazing fertility. Their peculiar dentition is, moreover, intermediate between the toothless condition of the Ant-bears and the well-armed jaws of the higher quadrupeds ; for they are altogether destitute of *canines*, and their *incisors*, which are separated by a great blank space from the *molars*, are furnished with enamel only on one side. They project from the front of each jaw in a curve ; and, as they have no roots, but spring from a pulpy germ deeply imbedded in their sockets, they are continually growing. These peculiarities have a direct relation to the habits of the animals ; for they live upon food, usually hard and solid, which they gnaw away atom by atom, with the tips of these projecting teeth. For this work it is needful that the tips of the teeth, which meet and play upon each other, should have a sharp chisel-like edge, and this result follows from the provision above mentioned, that the hard enamel is confined to the front side of the tooth ; the bony portion of the tip,

being soft, wears away more rapidly than the enamel of the front, which thus always presents a sharp cutting edge. The constant growth, too, just balances the ordinary wear of the teeth in eating, so that they are maintained in constant opposition to each other. The perfection of this balance becomes manifest, when, by accident, one of the incisor teeth is lost; for, in this case, the opposite tooth having no wear, grows out to a monstrous length, maintaining its original curve throughout, and becomes a tusk, which in time presents a bar to the reception of food, and death by starvation ensues.

Strange as it may be thought, there is an affinity by no means obscure, between these minute animals and the greatest of quadrupeds—between the Mouse and the Elephant. Not to speak of the similarity in form of many of their bones, and their jaws formed of parallel laminae, the latter is, like the former, destitute of canines, while its incisors assume a curved direction, and project from the mouth as great tusks. The molars of the Elephant, like those of the Guinea-pig, are composed of a number of vertical transverse laminae of bone, each covered with enamel, cemented together by a third substance closely similar to ivory. “This last substance, being much softer than the enamel, wears away faster by the mastication of the food, so that the enamel remains considerably higher, and in this manner the surface of each grinder acquires a ribbed appearance, as if originally formed with ridges. From very accurate observations which have been made on the Asiatic Elephant, it appears that the first set of grinders, or milk-teeth, begin to cut the jaw eight or ten days after birth, and the grinders of the upper jaw appear before those of the lower one. These milk-grinders are not shed, but are gradually worn away during the time the second set are coming forward; and as soon as the body of the grinder is nearly worn away the fangs begin to be

absorbed. From the end of the second to the beginning of the sixth year the third set come gradually forward as the jaw lengthens, not only to fill up this additional space, but also to supply the place of the second set, which are during the same period gradually worn away, and have their fangs absorbed. From the beginning of the sixth to the end of the ninth year the fourth set of grinders come forward to supply the gradual waste of the third set. In this manner, to the end of life, the Elephant obtains a set of new teeth, as the old ones become unfit for the mastication of its food.”*

In the RUMINANTIA generally the dentition is still incomplete ; the incisors are absent from the upper jaw, the gums forming there a callous pad to receive the action of the lower teeth. Canines are found only in a few families.

It is not until we reach the Unguiculate or Clawed quadrupeds that we see the full complement of teeth. Among the CARNIVORA, for example, both the upper and under jaws are armed with molars, canines, and incisors ; the molars terminate in triangular cutting lobes, the canines are stout, conical, and pointed ; and the incisors numerous, but small, flattened, and chisel-shaped. And this seems to be the most perfect form of dentition in the Animal Kingdom, that which belongs to a type of organisation in which the characteristic attributes of an *animal* are most fully developed.

Let us, then, examine one of the Cat tribe (*Felidæ*) a little more in detail. How admirably every part of the structure is adapted to one end—the capture and destruction of living active prey—and how thoroughly all the organs, and all the parts of the body, are ancillary to each other ! The feet—the front pair in particular—are armed with five strong, hooked, compressed, sharp talons. These are the weapons principally relied on for dealing the death-

* Corse, in Brewster's "Encyclop."

blow ; it is needful, therefore, that they be kept always clean, pointed, and in order. A beautiful mechanism secures this. Every child knows, who has handled the velvet paw of a Cat, that in its ordinary condition the talons are quite concealed, but that in excitement they are forcibly thrown forward. The last joint of each toe, the tip of which is encased by the claw, is, in rest, drawn back, either upon, or at the side of the preceding joint, by the force of two elastic ligaments. From this position it is in an instant extended, by the contraction of a muscle beneath the toe, the tendon of which passes under the head of the last joint, as under a pulley, and is attached to the base of the claws. When the contraction ceases the claw again springs back to its place, and lies concealed in a deep fold of the skin.

The ordinary mode in which a feline animal, from the Lion down to the House-cat, disables its victim is by a sudden powerful blow with the fore-paw. To make this stroke effective, it is necessary that the arm should be moved by vigorous muscles. Perhaps some of our readers may have felt, to their cost, how stinging a blow can be inflicted by the paw of an angry Cat. It has been truly observed, that in the limbs of the *Felidæ* we behold the finest display of muscular development which can be conceived. The dissected arm of a Lion or Tiger is a subject worthy the study of an artist. The muscles are dense, well-knit, short, but peculiarly thick and firm, and they are arranged for flexure or extension, for turning the face of the paw upward or downward, for the forward, lateral, or downward stroke, exactly as they are in man. The Tiger has been known to fracture the skull of a man with one stroke of its paw.

The Cats do not in general pursue their prey by the exercise of speed, but either creep up stealthily towards it until they arrive near enough to make the fatal bound, or

lie in wait for its approach. Then, when the keen eye, well practised to judge of distance, esteems the requisite proximity attained, one vigorous bound brings the active murderer full on its victim with prodigious force; the paw, with distended claws, inflicting a violent blow at the moment of descent. For these movements there are peculiar provisions. The lithe and flexible spine, accompanied by the power of the muscles, enables the Cat to throw itself forward with these sudden energetic bounds; while the same properties, combined with the shortness, freedom, and flexibility of its limbs, allow it to crouch close, to creep along with the belly on the ground, as every one has seen the domestic Cat do, when contemplating a mouse, or any other object which awakens her energy. The noiseless tread, also, so essential to the animal's purpose in stealing unperceived on its victim, is provided for, partly by the retraction of the claws already noticed, partly by the soft fur in which the feet are imbedded, but principally by the spongy pads which are seen beneath the toes. These pads have another use, even more important still; for they serve by their elasticity to lessen the shock, which otherwise would ensue to the nervous system, in descending from their vigorous bounds.

The prey being thus slain, or at least disabled, other ordinances of supreme Wisdom become apparent in providing for its appropriation. The teeth, already alluded to, come into requisition. A grinding action is not required; the flesh has merely to be divided into portions sufficiently small to be swallowed, and hence the teeth are all cutters. Look at what from their normal action in other animals we call the *molars*; their summits form lancet-like edges, clothed with the hardest enamel, and the lower ones shut close within the upper. Hence the action of these teeth is exactly that of the blades of a pair of

scissors, and the flesh and sinews are divided with the greatest ease and precision.

The sharp and prominent bony *ridges* of the skull, the strength and form of the *zygomatic arches*, and the size of the temporal *fossa*, indicate the immense extent and volume of the muscles that move the jaws, the force of which is increased by the simplicity of the movement required. There is no approach to that lateral working of the jaws upon each other, which we practise when we eat; nothing but a chopping or cutting action, the jaws having only a hinge movement. The muscles of the neck and breast are also particularly large and powerful in the Cats, to enable them to carry off or drag away their prey. A Lion has been seen to bear away a young bullock in his mouth, as a Cat would carry a rat.

During the process of cutting up and swallowing the flesh of the still quivering and palpitating prey, the warm blood flows freely, and this appears to be eminently grateful to the palate of the carnivorous tribes. They frequently pause in the process to lick the flesh, and thus to promote the flow of blood by exposing new blood-vessels. To enable them to effect this, there is an exquisite provision. Every one is aware that the tongue of the common Cat is rough, and that the sensation produced by its licking is that of a rasp or file. This depends on numerous and close-set horny *papillæ*, which project from the surface, the points being all directed backwards. When the Lion or Tiger, therefore, licks the reeking flesh, this structure of the tongue rapidly rasps away the surface. It is brought into action again when the teeth can detach no more flesh from the skeleton, the tongue now rasping off every fragment that adheres to the surface of the bones.

We might pursue this subject into further minutæ of detail; but enough has been said to show the mutua

relation of every part of an organised being ; and that, in all creatures, certain definite ends having been prescribed, all the organs are constructed and arranged, like the bands, and wheels, and cranks, and joints of an elaborate machine, to attain those ends in the most complete manner, and with the least possible waste of energy.

We are not writing for Atheists, or we might say with Paley: "The marks of *design* are too strong to be gotten over. Design must have had a designer. That designer must have been a person ; that person is GOD." But we perceive more than His entity, more than His foresight ; we perceive His benevolence, His care, His tenderness ; and these to be so large as to extend to *all* His works. "The young lions roar after their prey and seek their meat from GOD. . . . These wait all upon Thee ; that Thou mayst give them their meat in due season. That Thou givest them they gather : Thou openest Thine hand, they are filled with good. The glory of the LORD shall endure for ever : the LORD shall rejoice in His works."*

P. H. G.

* Ps. civ. 21-31.

DIVINE THOUGHTS IN THE FACTS OF CREATION.

THE PLANETS.*

IF we pass from the central orb to the planets of the solar system, the first thing that strikes us is their complication of movement. The Sun has one motion only,—that on his axis. The planets have each a motion on its own axis, and another motion around the Sun. As the basis of both of these, science recognises a necessity which it yet cannot interpret, the necessity for an original projectile force. Mere attraction would simply have drawn such a body as our Earth to the Sun, and fixed it there, supposing it to have come within his range. Its rotation can be accounted for, only on the principle of an original impetus communicated to it, independently of the Sun. But an original impetus, sufficient to produce that velocity of rotation which

* In the last of this series of papers the reader is requested to note that the proportions—strictly accurate—two-fifths, half, eleven and a half, six and a half, &c., applied to the size of Mercury, Mars, Jupiter, Neptune, &c., as compared with the Earth, refer not to the *volumes*, but to the *diameters* of these planets respectively.

In the same paper, also, an unaccountable blunder has somehow crept in with respect to the circumference of the Sun, and, in connexion with this, the rate of his velocity. The greatness and obviousness of the blunder, we trust, will effectually prevent it from leading any of our readers into error; and the chosen argument, from outlying *fact* to inlying *thought*, is not in the remotest degree touched by it.

It belongs to the *rudiments* of astronomy that the volume of the Sun is upwards of a million times larger than the volume of the Earth, that his diameter is 110 times that of the Earth, that his circumference is not quite three millions of miles, and that he accomplishes his revolution on his own axis in about twenty-five days. Every child, by the aid of the simplest arithmetic, is able from these data to calculate exactly the rate of the Sun's velocity as compared with that of the Earth.

it now has, might, according to its direction, have sent the Earth either right into the Sun, or indefinitely beyond his influence, to wander in boundless space. To originate a motion around the Sun, two things required to be calculated and exactly adjusted,—the *force* of the impetus, in other words, the amount of the velocity, and the *direction* of the impetus. The Earth projected into space (science does not, cannot explain how or when), in order to acquire that motion which it actually now has around the Sun, must have been so projected, with a *certain* amount of force and no other, and in one *precise* direction and no other. Thus it must also have been, in like manner, with all the planets. In the case of each, to originate the self-rotation and the vaster circuit around the Sun, the projectile force must have been mathematically precise in its *amount* and in its *direction*. Here, as everywhere, we find ourselves in a region of almost pure thought. We are conversing with matters of nice calculation, with the palpable products of reason, with Divine ideas, with a work which was first ideal and then real, and which has no meaning and no explication, except in connexion with profound thought.

But there is a still greater complication of planetary movement, which must be noticed. Besides the self-rotation and the course around the Sun which belong to the primary planets, there are many secondary spheres, the satellites, that have a third movement around the orbs with which they are severally connected. Besides the original projectile force, its amount and its direction, besides the complication of movements that has been named, there are several other important elements that enter into the calculation, and that bear immensely on the result—the magnitudes of the planets, primary and secondary, their distances from the Sun and their relative distances from one another, their position, whether in the same or in different planes, their movements, whether in the same or in different

directions. It must not be overlooked, that not only are all the planets attracted by the Sun, they are also attracted by one another. Each attracts and is attracted by the others. With these actions and reactions, these various magnitudes, distances, and velocities, it was required to originate a system that should be uniform and permanent. Why, we may ask, are all the planets nearly circular in form? Why, in each case, is the shortest axis that which is chosen as the axis of rotation? Why do they all move, whether on their own axis or around the Sun, in one direction from west to east, as the Sun himself moves? Why do they all move nearly, though not quite, in one plane, forming by their orbits a series of nearly concentric circles? The variations in the case of the minor planets, situated between Mars and Jupiter, need not here be named. With this exception, the orbits of Mercury, Venus, and the other larger planets, are so many concentric circles, the outermost of which is the mighty orbit of Neptune, at a distance of two thousand nine hundred millions of miles from the centre.

It has been triumphantly shown that the existing arrangement possesses the highest advantages over every other that could have been selected. It has been shown, that even a slight deviation in a single case from the actual form of the planets, their magnitudes, their relative distances, their axis of rotation, their velocities, the direction or the plane of their movement, must have given rise to causes which had certainly ended in the derangement and utter destruction of the whole. By the existing arrangement, a system overwhelmingly grand is constituted, which, while its harmony is of surpassing beauty, seems at the same time to be indestructible.

Two mighty laws lie at the foundation of the solar system, and secure its harmony and its permanence—the law of attraction and the law of repulsion. The latter is connected with that primitive projectile force, with which

it may be conceived the planets were at first launched into space. This force originates self-rotation, in other words, the tendency of the separate parts of a compressible sphere to fly off, modified by the antagonist tendency to cohere, producing, according to the amount of velocity, an expansion of the equatorial circumference and a flattening around the poles of the axis of motion. On the other hand, and in the same way, this force originates the tendency in the body as a whole to resist and repel every influence that would draw it aside from the direct onward line of motion into which it has been projected. Let us now suppose the Earth, or any other of the planets, speeding its onward course in obedience to the original force that launched it into space, at length suddenly coming within the range of the Sun. His enormous attractive power would tend to draw it completely in to himself. But it is already endowed with a tendency to move right onward in a straight line and to fly off from him. There are thus two forces acting upon the planet, and it is the proportion and balance of these that give it its movement around the Sun, which might, according to circumstances, have been circular, or elliptical, or any one of numberless possible combinations of these. The actual fact of our system is, that the two forces, the one centripetal or attractive, the other centrifugal or repulsive, are so proportioned, that the motion of the planets around the Sun is nearly circular. Each planet is thus, as it were, supported by the combined action of two antagonistic forces, the one drawing it into the Sun, the other urging it every instant to strike off at a tangent, both together keeping it at nearly a uniform distance from the centre. A planet in this view involves profound and intricate calculation; it is a mighty idea realised, a distinct articulate utterance of thought. But the whole together, planets and satellites, in their single, double, and triple movements, with their different magnitudes, distances, velocities, con-

stantly acting and re-acting, yet all preserving a harmony that knows no interruption, what thought, what wisdom do they not embody and reveal?

Of the two laws, on whose adjusted antagonism the harmony and permanence of the solar system depend, an immense amount of influence belongs to attraction or gravitation. This may be said to be the one pervading and reigning force in the material universe. It is the same in our Earth, and in each of the planets, and in the Sun himself,—the same in the atom and in the sphere. Every single particle of matter attracts, and is attracted, by every other. Every combination of particles, small or large, and of whatever form, attracts, and is attracted, by every other combination. One law reigns in a drop of water, the fragment of a rock and the revolutions of the spheres. The force of gravitation acts according to a determinate rule, and its amount is always and everywhere mathematically exact. It is greatest when bodies are immediately near to one another, and diminishes in proportion as their distance increases,—diminishes in a fixed and invariable proportion, the proportion of the squares of the distances. The solar system is governed by this mathematically precise law, and all the magnitudes, distances, orbits, planes, and forms of the planets, are adapted to it with critical exactness. So much is this the case, that La Grange has shown that, but for the very ratio in which the law of gravitation acts, the inverse ratio of the squares of the distances, by a deviation ever so slight, fatal derangement was inevitable. But it is not meant to be conveyed that there are no apparent imperfections and irregularities in the existing planetary system. It is certain, on the contrary, that changes have occurred, and are occurring; for example, in the eccentricity of the Earth's orbit, in the velocity of the Moon's motion, and in the obliquity of the ecliptic, which may be conceived to affect the permanence of the economy. The question is per-

fectly legitimate: Is there no likelihood that these or other changes may yet prove fatal? "It was shown by La Grange and La Place, that the arrangements of the solar system are stable, that in the long run the orbits and motions remain unchanged, and that the changes in the orbits which take place in shorter periods never transgress certain very moderate limits. Each orbit undergoes deviations on this side and on that of its average state; but these deviations are never very great, and it finally recovers from them, so that the average is preserved. The planets produce perpetual perturbations in each other's motions, but these perturbations are not indefinitely progressive: they are periodical, they reach a maximum value and then diminish. The periods which this restoration requires are, for the most part, enormous; not less than thousands, and in some instances millions of years, and hence it is that some of these apparent derangements have been going on in the same direction since the beginning of the history of the world. But the restoration is in the sequel as complete as the derangement, and in the meantime the disturbance never attains a sufficient amount seriously to alter the adaptations of the system."

"The same examination of the subject by which this is proved points out also the condition on which the stability depends. 'I have succeeded in demonstrating,' says La Place, 'that whatever be the masses of the planets, in consequence of the fact that they all move in the same direction, in orbits of small eccentricity and slightly inclined to each other, their singular inequalities are periodical and included within narrow limits; so that the planetary system will only oscillate about a mean state and will never deviate from it, except by a very small quantity. The ellipses of the planets have been, and always will be, nearly circular. The ecliptic will never coincide with the equator, and the

entire extent of the variation in its inclination cannot exceed three degrees.'

"There exists, therefore, it appears, in the solar system, a provision for the permanent regularity of its motions, and this provision is found in the fact that the orbits of the planets are nearly circular, and nearly in the same plane, and the motions all in the same direction; namely, from west to east."—(Whewell's "Astronomy," pp. 163, 164.)

It admits of no denial that the solar system is, in every view, a product of reason, in which no contingency has been overlooked, and whose very seeming imperfections arise from causes which actually go to secure its permanence and indestructibility. To such an extent is it a work of reason, an embodiment of thought, that the human mind has actually discovered some of the substantial material facts of that system, by following out the train of its own ideas. One striking example may here be adduced.

The discovery of the planet Neptune was as much the result of reasoning as of observation. Certain apparent irregularities were found in the orbit of Uranus, which could not be accounted for by any of the then known conditions of the planetary system. Monsieur Le Verrier conjectured that these irregularities might be caused by the attraction of some planet as yet undiscovered. From these irregularities he calculated what must be the orbit of a planet that should produce them, and he actually predicted where such a planet must be found on a certain day. The planet Neptune, a full third larger in diameter than Uranus, and six and a half times than our Earth, was discovered.

The thoughts of God, uttered in the facts of creation, man is able to interpret, sometimes even to anticipate. With the page before us, on which the ideas are written out, even anticipating their current and verifying our anticipations, we worship the Great Thinker. QUÆRENS.

LEAVES FROM THE LINDEN GROVES.

GERMAN LAYS TRANSLATED.

“TAKE ME.”

TAKE me,
Faithful Saviour, as I am ;
Make me
Of Thy pure flock a lamb.
As I spoke
A sweet “Amen” awoke :
My heavy chain of sin and sorrow broke.
DE LA MOTTE FOUQUÉ.

PARTING.

What mean ye thus to weep,
And grieve my saddened heart ?
In God we one must keep,
In Him we need not part.
The band which us hath bound
Heeds neither time nor place,
Who in the Lord is found
Aye sees his Father's face.

Man reaches out the hand
A long farewell to say,
And yet that union band
Obliges him to stay.
Man looks upon another
With a last long sigh and tear,
And yet that parted brother
In God is just as near.

Why should our tears flow down,
 Our hearts so sadly beat?
 We know so well the One
 In whom we all can meet.
 Under one Eye we stay—
 We're led by one dear Hand,
 In one secure, straight way,
 Unto our fatherland.

Let not this hour be viewed
 With parting's heavy pain—
 But be our vow renewed
 With our dear Lord again.
 While prayer to heaven can wend,
 And Jesus' face we see,
 Friend is not lost to friend,
 Though bitter parting be.

SPITTA.

EVENING.

The sun sinks in the west,
 The stilly night is come;
 My weary body rest,
 Thy day's work is all done.

But thou, my soul, O fleet
 Mount up from earth's dark sod;
 Soar to thy rest so sweet,
 The bosom of thy God;—

Thy God, whose kind love fills
 Those gold-bright, glorious lands,
 Where o'er these darkening hills
 The heaven wide open stands. STURM.

PASSING AWAY.

I'd like to pass from hence, like the deep glow of eve,
 Like the sweet day whose dying scarce we see,
 Till gathering darkness round us we perceive,
 And know it softly passed into eternity.

I'd like to pass from hence, like the mild, cheerful star,
 In glowing love and radiance calmly bright,
 So gently and so sweetly travel far
 Through the deep, stilly blue, to God's own throne of light.

I'd like to pass from hence, like the sweet scent of flowers,
 So joyous wafted from the lovely cup,
 An incense from earth's beauty-beaming bowers,
 Borne by the wingèd winds to God's high altar up.

I'd like to pass from hence, like the sweet victory tone
 That from a harp-string joyfully forth-springs;
 Scarce has the sound from the trembling metal flown,
 When in its maker's breast the welcome music rings.

—Thou wilt not pass away like evening's fading hour,
 Thou wilt not gently vanish like the star;
 Thou wilt not die the light death of a flower,
 And from thy struggling soul may victory songs be far.

Thou'lt gently pass away — without a pang, away!
 For first thy wonted strength shall thee forsake;
 Alone in Nature is such sweet decay,
 And to eternal life thou'lt gradually awake.

And thou wilt pass from hence like dew at early morn,
 On which the thirsty sun so joyfully doth gleam. —
 Then come, Soul-Sun, my Jesus, quickly dawn,
 And draw my weary spirit up into thy beam.

THE FATHERLAND.

Know ye that land?—It lies not on this earth,
And yet it is the bright land of our birth;
There sounds no sigh, there flows no bitter tear,
The land of light unto our heart so dear.
Know ye it, then?—Away! away!
Press on, O friends, unto eternal day.

Know ye the way?—the rough and thorny road,
Where sinks the traveller 'neath his pressing load,
And sinking, cries, "Thou, Father, God of love,
Cut short my way, O bring me there above!"
Know ye it, then? Its gloom, its gloom,
Fades into light where heavenly pastures bloom.

Know ye the Friend?—He is a child of man,
Yet more than thousand friends he succour can;
He goes before o'er the rough path of thorn,
And aids the pilgrim wearied and forlorn.
Know ye Him, then?—His hand, His hand,
Guides still and surely to the fatherland.

HANS CLAUS.

EVENING ASPIRATION.

I stood upon the mountain's height
When home the sun was wending,
Its softened glow of golden light
The evening's glory lending.

In dew to earth had dropped
Heaven's peace so still and deep,
The vesper-bell, just stopped,
Had lulled the vale to sleep.

I spoke, O heart, conceive
This stillness sweet and blest ;
Content, thy cares now leave,
Give up thyself to rest.

Each flower its eye doth close
In stilly evening dream ;
More slow and gently flows
Each ripple in the stream.

The kindly zephyrs rock
The birds in cradled nest ;
The shepherd with his flock
Slow seeks his nightly rest.

The golden beetle sleeps
Bedded in rose-leaves' glow ;
In forests dark and deep
Are resting stag and roe.

He who a home doth own
The lovely rest may share ;
He who far wandereth lone,
On dream-wings fleeth there.

Deep longing holds my soul
At such an hour as this,
To mount and reach the goal
Where my dear homestead is !

RÜCKERT.

EVENING WORSHIP.

How lovely the evening hour,
How smiling departing day,
How sweetly the birds are singing
On their longing nestward way!

The bright flowers must silent be,
To them is no voice allowed ;
Yet in quiet prayer to their God
Their heads to the earth are bowed.

'Tis quiet evening worship
Where'er I gaze or roam,
Soft on the waters is painted
The beautiful heaven's dome.

And all things living sing
One holy, peaceful lay ;
And all things now plead so gently,
" Man ! thou must also pray."

SPITTA.

EVENING PRAYER.

Now is the day flown by,
And darkly sleeps the earth,
Upon the deep grey sky
Each sparklet has new birth.

On yonder young green branch
Pours forth the nightingale,—
The only sounds that launch
Across the silent vale.

And I, O Father ! stay
Before my cottage-door,
Mine eyes in rapture stray
O'er thy bright palace-floor.
Oh, would that I could sing
Clear as the nightingale,
That to Thine ear might ring
My want and sorrow-tale.

Yes, yes, a sorrow-tale—
For as the dark night nears,
My trembling heart doth quail,
Within spring wells of tears ;—
Of tears and sighing wrung
From out this heart of stone,
Griefs neither said nor sung,
But, Lord, to Thee well known.

Thou know'st the sorrow-tale
That makes me seek the sky,
When 'neath sweet slumber's veil
The weary world doth lie ;—
Know'st 'neath what heavy load
My heart heaves there above,
And pleads a shortened road
Or quickening from Thy love.

Yes! from Thine own sweet love,
 That heals my bitter smart ;
Yes, yes, Thine own sweet love,
 That stills my wringing heart.
That beam dispels in tears
 The ice within my breast,
The troubled waters nears,
 And bids them be at rest.

Ah! why should I complain
 When that dear love is nigh,
And why should I be fain
 T' escape the world and die?
No, Jesus; I will trust
 In Thy sweet precious blood,
In that I will and must
 Be reconciled with God.

O Jesus, spread Thine arms,
 And take me to Thy breast ;
There vanish these alarms,
 There can the tired one rest !
I'll lay me down to sleep,
 Still resting on Thine arm,
Assured that Thou wilt keep
 Thy child from every harm.

ARNDT.

THE HEAVENLY SUITOR.

A holy love-song hath been sweetly sung
 In yonder time so grey,
Through thousand years its sound hath rung,
 And rings to-day.

Of such a love speaks the sweet, swelling sound
 As loves unto the last ;
It loved me, too : even me it found,
 And still holds fast.

My woes and cares all fled in Heaven's bright rays,
 Which pierced my heart's chill sod ;
On thee I fixed my wondering gaze,
 - Thou Son of God.

Thou saidst, "For thee I bled, was crowned with thorn,
 Suffered derision's smart,
And such a death as none hath borne,—
 Give me thine heart."

And is it for this worthless heart of mine
 Thy endless love doth call?
Oh, that it ever had been thine!—
 Lord, take it all.

P. F. STRAUSS.

OURSELVES.

THE CIRCULATION OF THE BLOOD.

UNTIL the time of our illustrious countryman, Harvey, the blood was thought to undulate rather than to circulate.*

He sagaciously inferred from the construction of the floodgates in the Heart, their position, and seeming uses, and from the structure and seeming uses of the valves in blood-vessels, that the blood could not ebb and flow; that there could be no waving of it backwards and forwards in the same vessels, but that it must perform a real circuit through the whole vascular system.

His theory of the circulation, founded on those inferences, and on the conclusions deducible from them, though greatly ridiculed and impugned at the time, is now acknowledged to be the true explanation of the function.

The *Heart* is the centre of the Circulating System. It is a hollow, muscular organ, of a pyramidal or conical shape, and lies obliquely across the middle of the chest, between the lungs, with its apex inclined forwards, outwards, and downwards, towards the sixth rib on the left side.

Its medium weight is about eleven ounces for a man, and nine for a woman.†

The arrangement of the muscular fibres of which it is chiefly composed is regularly irregular. They form three

* Unless the expression "the wheel broken at the cistern," implies the Circulation, and that Solomon was acquainted with it. In his "Portraiture of Old Age," which is a clever and interesting commentary on the 12th chapter of Ecclesiastes, Dr. Smith renders it very probable, if he does not prove, that such is the meaning of the passage.

† Disease greatly modifies these numbers. It has been found weighing as little as two, and as much as twenty-eight ounces.

strata, connected more or less with one another, and with four membranous zones by which the whole organ is encircled.

A membranous bag, called by anatomists the *Pericardium*, which varies a good deal in thickness, and which is thin and transparent where it is in immediate contact with the heart, but elsewhere strong, opaque, and compact, envelopes and adheres closely to its outer surface. By this it is attached, and in some degree fixed, at its base, to the parts in the immediate neighbourhood. Being reflected off from these, and from the base of the heart, it forms a sac, in which the heart lies free and disengaged, as the head does in the outer duplicature of a double nightcap.

There is always a small quantity of fluid, commonly from one to four ounces, in this sac, termed the *Liquor of the Pericardium*, by which the surfaces are kept moist and free from irritation. Increased, as it sometimes is, by disease, it occasions *Dropsy of the Pericardium*.

The interior structure of the heart is somewhat elaborate. It contains four cavities; two of which are called *Auricles*,* the others *Ventricles*.† The auricles occupy the base, the ventricles make up the body or cone of the heart. An auricle and a ventricle form its right, and an auricle and a ventricle its left side; or, almost as properly, form the right and left hearts; for we are really double-hearted. On each side the auricle communicates directly with its corresponding ventricle, but only indirectly and circuitously with the other cavities. In each of the cavities are found bundles of fleshy fibres, called *Carneæ Columnæ*. They are more numerous in the auricles than in the ventricles, and on the right than the left side of the heart. They seem to strengthen and support its walls; and are irregularly placed.

A smooth membrane, consisting of two tolerably distinct

* From some resemblance to the flap of a dog's ear.

† *Venter*, the belly or body of the organ.

layers, lines the inner surface of the cavities, and also covers the *carneæ columnæ*. Folded upon itself, and shaped to suit the forms of the different openings, the innermost layer makes the *Valves*, by which the distinctness of each cavity is preserved, and by which the blood is prevented from returning, when once it has entered into any of the cavities.

The heart has its own special blood-vessels. Its Lymphatics are very numerous and distinct.

The nerves with which it is supplied are small in reference to the size of the organ; and they are neither nerves of volition or feeling. They are derived from the Great Sympathetic, and from those which are also distributed to the lungs and stomach. Hence, happily, the heart is very insensible* except to its own proper stimuli; and not under the influence of the will.†

* "The observation of the admirable Harvey is to this effect. A noble youth of the family of Montgomery, from a fall and consequent abscess of the chest, had the interior so marvellously exposed, that after his cure, on his return from his travels, the heart and lungs were visible and could be handled; which, when it was mentioned to Charles I., he expressed a wish that Harvey should be permitted to see the youth and examine his heart. 'When,' says Harvey, 'I had paid my respects to this young nobleman, and conveyed to him the king's request, he made no concealment, but exposed the left side of his breast, when I saw a cavity into which I could introduce my fingers and thumb; astonished with the novelty, again and again I explored the wound, and first marvelling at the extraordinary nature of the cure, I set about examining the heart. Taking it in one hand, and placing the finger of the other on the pulse of the wrist, I satisfied myself that it was indeed the heart which I grasped. I then brought him to the king that he might behold and touch so extraordinary a thing, and that he might perceive, as I did, that unless when we touched the outer skin, or when he saw our fingers in the cavity, this young nobleman knew not that we touched his heart.' "

† The only known exception to this otherwise inviolable rule is the remarkable case of Colonel Townshend, detailed by Dr. Cheyne in his "Treatise on Nervous Diseases," who, with Dr. Baynard and Mr. Skrine, were attending on the Colonel for an affection of the kidneys by

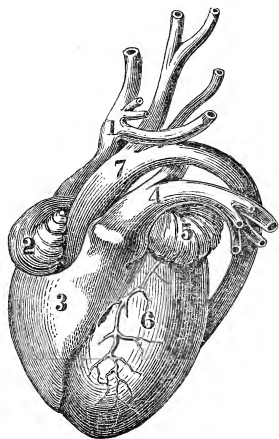
The heart is constructed to dilate and contract. These are its natural and proper movements, and by them its functions are fulfilled. They are called by physiologists its *Diastolè* and *Systolè*, and occasion what is commonly known by the term *Pulsation*.

Very many circumstances cause differences in the number of pulsations in a given time. As general rules, the pulse is more frequent in women than in men; in short than in tall persons; and slower in cold than in warm climates. Its frequency varies greatly with age. A new-born infant's pulse beats 136 times in a minute; towards the end of the first year, 124 times; the second, 110 times; third and fourth, 96 times; fifth, 88 times; ten to fifteen, 78 to 80 times; manhood, 70 to 75 times; at sixty, 60 times.

All febrile excitement increases its frequency. It is slower when we lie down, than when we are sitting; and as might be expected, therefore, it is quickened by standing. which his health was impaired and his life endangered. "He sent for us one morning," says Dr. Cheyne, "to give us some account of an odd sensation, he had for some time observed and felt in himself; which was, that composing himself *he could die or expire when he pleased, and yet by an effort, or somehow, he could come to life again.*" He insisted so much on their seeing him make the trial, that they were at last forced to comply. "We all three felt his pulse first," continues the Doctor; "it was distinct, though small and thready, and his heart had its usual beatings. He composed himself on his back, and lay in a still posture for some time; gradually his pulse sunk and could not be felt; his heart ceased to beat; and he did not breathe; nor was there any discoverable symptom of life remaining." In this state he continued for half-an-hour, and they were about to leave him, supposing he was dead; when observing some motion about the body, they found his pulse and the motion of his heart returning; he began to breathe gently and to speak softly, and before long he had recovered from this most singular condition. "He afterwards called for his attorney, added a codicil to his will, settled legacies on his servants, received the sacrament, and composedly expired in the evening. Next day he was opened (at his own request). His lungs were fair and sound, and his heart big and strong."

It is also quickened by food, by stimulating drinks, by mental excitement, by muscular efforts, by heat, and probably by a diminution of atmospheric pressure. It is always slower during sleep. Old age does not seem, proportionately, to retard it. Some persons have preternaturally slow, others quick pulses. Dr. Fordyce mentions having seen a healthy man whose pulse only beat twenty times in a minute.

At every stroke of the heart, at each systolè, about two ounces of blood are delivered from each of the ventricles into the large vessels which proceed from them—into the *Aorta*, which arises from the left ventricle, and conveys the blood into the system, for general purposes; and into the *pulmonary artery* from the right ventricle, by which it is carried to the lungs, for special purposes. During their expansion, during the diastolè of the ventricles, the blood is admitted into each from its corresponding auricle, where it has just before been received from the system and from the lungs. In each case its regress is prohibited by suitable valves. Its course will, perhaps, be better understood by reference



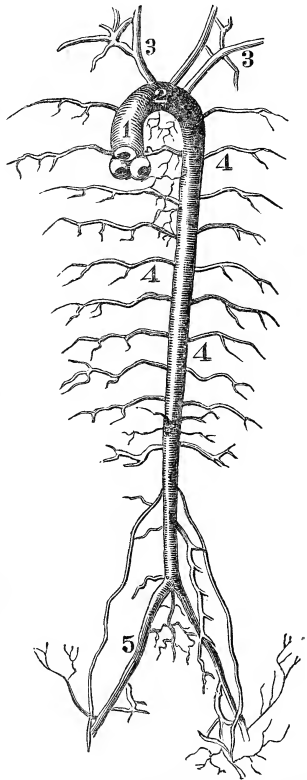
to the accompanying sketch of the Heart and the vessels connected with it. No. 1, indicates the veins, the *venæ cavæ*, by which the blood returns from the general system, terminating in No. 2, the right auricle. No. 3, the right ventricle; whence arises No. 4, the pulmonary artery, through it the blood passes to the lungs, and returns by four *pulmonary veins*, not shown in the drawing, to No. 5, the left auricle. The left auricle delivers it

into No. 6, the left ventricle; out of which springs No. 7, the *aorta*, the main trunk of the vessels by which it is distributed over the whole system.

Thus the double heart fulfils a fourfold function, like two forcing-pumps acting simultaneously. It first derives the blood from the general system, and then forwards it to the lungs; again inducing its return from the lungs, it diffuses it through the system.

The vessels which convey the blood from the heart are called *Arteries*.* It is brought back by the *Veins*.

The *arteries* are strong, compact, very elastic, muscular tubes. Directly or indirectly, those which supply the general system arise from the Aorta. Its course is shown tolerably well in the annexed diagram, and how the subordinate branches originate. No. 1 points to the orifice of the aorta, by which it communicates with the heart. Three crescent-shaped valves most accurately close this opening. They are shown, a little exaggerated, in the sketch. No. 2 is the arch of the aorta, whence arise Nos. 3 3, the vessels which go to the head



*-The term is derived from two Greek words signifying air, and to carry. Being always found empty after death, they were supposed to be aëriferous tubes.

and upper extremities. Nos. 4 4, the arteries which supply the walls of the chest, the viscera of the abdomen, &c. &c. No. 5, the division of the aorta into two branches, which again subdivide, to supply the lower extremities.

During their course, the arteries frequently communicate with one another, or, as it is technically termed, *anastomose*, by collateral branches; so that if any particular vessel is obstructed, the circulation is not, on that account, interrupted. The minute divisions into which they ultimately separate are called *Capillaries*, which pervade every part of the body where a supply is needed.

The blood is brought back to the heart by the *Veins*. These are not mere counterparts to the arteries, but are larger and more numerous. Their structure also is different, and so are their functions. Their coats are thin, not muscular, and not very elastic. They ramify much more than the arteries do, and are more irregular in their course and divisions. Another distinction is the beautiful supply of valves, with which they are plentifully furnished, and which open only towards the heart.

The communication between the capillaries in which the arteries terminate and those by which the veins begin, though not clearly seen in the human person, is beautifully shown by the microscope in the transparent membranes of frogs and fishes. The little branches successively join, and form larger vessels, which ultimately unite into two main trunks, called the *Venæ Cavæ*. These pour their accumulated contents into the heart.

P. S.

CANDLES AND LAMPS.

(Continued.)

1. *Rape-oil* is found in the small, round, dry seeds of the winter and summer rape (*Brassica napus*), associated with mucus, albumen, &c. The seed is better when kept for some time, as it then contains less of the injurious constituents, while the albumen is more easily rendered insoluble, when subjecting the seed to heat.

The mode of obtaining the oil varies somewhat in different localities. The hard integument of the seed is first broken between cast-iron rollers, and the crushed seed is reduced to as fine a powder or flour as possible, beneath ponderous, granite edge-stones. This flour is then heated by means of steam in close vessels, and afterwards put into woollen cloths, which are wrapped in horse-hair bags. These bags are subjected to enormous pressure in hydraulic presses, or in the old Dutch mills or wedge-presses. In the former the power exerted is equal to four hundred tons distributed over the surface of the pressing slab.

The produce of oil varies from 25 to 50 per cent, and requires to be purified, which is termed *Clarification*. The plan most generally adopted depends upon the peculiar action of sulphuric acid; which first removes the water from the mucus, by which it was held in suspension in the oil, and then chars the mucus itself to a black mass. The impurities are now removed by filtration, and the last traces of the acid separated by washing the oil with water and milk of lime. Watt has proposed the use of oxidising agents, as chromic acid; and Cogen, a solution of the caustic alkalis, but neither plan has been generally adopted.

The oil of the Colza (*Brassica oleracea*), a variety of the common cabbage, also much grown in the south of Europe, is obtained from its seeds in a similar manner. In France this oil has been adopted for all the purposes of light-houses, and has lately come into extensive use in this country for the Moderateur Lamps.

2. *Olive oil*.—The olive-tree (*Olea Europæa*) produces a stone fruit, the fleshy, greenish-brown integument of which contains an oil, exceeding all others in sweetness. The tree is a native of Asia, but grows luxuriantly in Southern Europe; they begin to bear fruit in five years, and continue productive for a century, and sometimes longer. The more common kinds only are used for burning. The fruit is allowed to undergo a kind of fermentation, and after being bruised under edge-stones, it is placed in rush sacks, and subjected to pressure in a kind of wine-press. The first runnings are termed the *virgin oil*, and that still left behind in the cake is obtained by digesting the dry residue in water and again submitting it to pressure. This process is repeated two or three times.

Gallipoli is one of the principal ports whence olive-oil is exported, and large tanks are constructed in the rock on which the port is built, where the crude oils are collected as they arrive in skins from the interior. The mucus is here deposited, and the oil becomes clear and bright.

It already forms an article of export from Chili, and the tree grows to a great height in Australia.

3. *Palm-oil* is a vegetable fat extracted from the fruit of a kind of palm, the produce of the tropical parts of Africa, south of Fernando Po. The history of the introduction of this article into commerce, is interwoven with the suppression of the accursed traffic in slaves; and amid our many short-comings as a nation, that point is peerless in the past, when Parliament voted twenty millions to restore to our

black fellow-subjects the birthright of which we had deprived them,—

“ And taught the world that while she rules the waves,
Her soil is freedom to the feet of slaves.”

Instead of a fleet of slavers waiting for their quivering, living freight of immortal beings at the mouth of the *Bony River*, our Liverpool merchant-princes traffic with the produce of our looms and forges for shiploads of this, thus doubly, interesting palm-oil.

A generation ago, there was no property in palm-trees in Africa, but now *plantations*, as they are called, attract attention, and lately the title to some has been disputed in our courts on the Gold Coast, once the seat of a flourishing slave-trade. Thus, the feeling of property, and the desire of accumulation, show that the germs of nascent civilisation are springing forth from the labours of those philanthropic and Christian men who have passed to their rest.

Although somewhat foreign to our present subject, we cannot refrain from expressing the wish, that England had done, or would do, something to assist her children across the Atlantic in the present extremity of their history, arising out of their domestic institution—in reality, the fruit of a legacy left them by this country. We have lately spent not far short of one hundred millions sterling in the work of destruction: how much more glorious to present the Americans with a similar sum,—to help to redeem their slaves from bondage, free their escutcheon from the foul blot, and cement our national amity for a thousand generations.

The fruit of the palm is of the form and size of a pigeon's egg, of a golden-yellow colour, containing a hard stone, inclosed in a fleshy integument. This fleshy portion is bruised and boiled with water, when the oil separates on the top, and can be easily collected. It solidifies to the consistence of firm butter, assuming the appearance of a red-

dish-yellow fat, and should be more properly called *palm butter*. It has a strong aromatic smell; but in commerce, is in a rancid state. Its characteristic constituent is *palmitic acid* in combination with glycerine, forming *palmitin*.

Various plans are employed for *bleaching* this oil: Davidson uses a solution of chloride of lime, or a mixture of oxide of manganese, common salt, and sulphuric acid. The carbonic acid of the air, in the former case, separates the chlorine, which is produced at once by the chemical action of the latter materials. Michaelis merely uses oxide of manganese and sulphuric acid, trusting to the liberation of the nascent oxygen for the bleaching action. Zier, again, melts the palm-oil by means of steam, and allows it to fall through a column of air in towers constructed for the purpose, when the colour is removed by the joint action of air and heat. This process has been further modified, by exposing the melted oil in shallow cisterns to the bleaching action of air and light. Lastly, Watt employs a mixture of bichromate of potash, common salt, and sulphuric acid. The sulphuric acid decomposes both the other substances, liberating chromic acid, half of whose oxygen destroys the colouring matter, while the residual oxide of chromium is dissolved by the muriatic acid, simultaneously disengaged from the common salt. The water thus holds all the products of the process in solution, and allows the bleached palm-oil to be removed from its surface without difficulty. A substance often confounded with this oil, called *Galam*, or *Thea butter*, is very similar in appearance and properties, and also comes from Africa. Another oil, but less known in commerce, is also very similar to the above, both in its origin and nature, called *oil of Illissa*, and is obtained from the fruit or seeds of trees growing on the coasts of Coromandel and Bengal.

4. *Cocoa-nut Oil*, or *Butter*, is extracted from the ker-

nels of the cocoa-palm, either by pressure or boiling. This palm is indigenous to the two Indian Peninsulas, and it is also found spread over immense districts in the Brazils. The kernels, called in commerce *Copperah*, are brought to this country, cut into pieces, heated, and submitted to pressure in the usual way to extract the oil, the produce of which amounts to 60 per cent.

5. *Vegetable Tallow of China*.—This white sebaceous substance envelopes the seed in the nuts of the *Stillingia sebifera*, which is cultivated in several provinces of China. The nuts are pounded in a mortar to loosen the seeds, and are then steamed in tubs with open, convex wicker-bottoms, placed over caldrons of boiling-water. When thoroughly heated, they are reduced to mash in a mortar, and transferred to bamboo sieves kept at a uniform temperature over hot ashes. This operation is repeated. The produce becomes a solid mass on falling through the sieves, and is purified by re-melting and a rude process of pressure. It is a hard, brittle, white, opaque, and tasteless tallow, but without any odour, and may be considered as nearly pure stearine. The oil (*elaine*) is obtained by pressure from the kernel, and is in common use for lamps.

The candles are made from this vegetable tallow.

6. *Resin*.—This substance is obtained from the sap of the *Coniferæ*, or fir-tribe, particularly from the genus *Pinus*, in which it is partly held in solution by a volatile oil, and partly produced from the latter by oxidation on exposure to the air. North America is the chief source of resin, where it is procured by making incisions in the trees in spring, when the sap is in motion, and collecting the resinous juice. A white matter is at first collected, which is employed in making flambeaux instead of white wax. The juice which exudes afterwards is strained through a basket, in which the thicker portions may remain. The filtrate is sold as

common turpentine, and the rest is distilled with water as long as any oil passes over, leaving a yellow or dark-coloured residue. The product is *oil of turpentine* or *turps*, and the residuum is *resin* or *colophony*.

The oil of turpentine is a carbo-hydrogen ($C_{20} H_{16}$), and the resin a mixture of two acids, called *sylvic* and *pinic*, having the same ultimate composition ($C_{20} H_{15} O_2$).

The different varieties of turpentine of commerce are distinguished from each other by the different proportions of oil and resin they contain. Some have an agreeable odour, as *Canada balsam*; and that from Barbary affords a highly aromatic body, called *China turpentine*; while the *Abies communis* yields *frankincense*.

The yellow or brown colour of resin depends upon the extent to which the distillation has been carried, and the dark colour of colophony is owing to the conversion of part of the pinic acid into *colophonic acid*. The substance known as *cobbler's-wax* is a fused mixture of colophony, and a variable quantity of pitch.

When the crude oil of turpentine is distilled with potash, afterwards with water, and finally with chloride of calcium, a perfectly limpid, colourless oil is obtained, of a peculiar odour, and burning taste. It burns with a white flame and much smoke, and requires a particular arrangement in the wick and burner for perfect combustion. It has the same ultimate composition as the oils of lemon, orange-peel, bergamot, pepper, juniper, laurel, &c. ($C_5 H_4$), and muriatic acid combines with it, forming *artificial camphor*.

7. *Naphtha and Paraffine*.—The liquid hydrocarbons found in various localities, derived from the slow decomposition of the carboniferous strata, are sometimes employed for street-lighting in lamps. The streets of Genoa, for instance, are lighted with the naphtha from a neighbouring spring at Amiano. Among the secondary products in the

manufacture of coal-gas, there are several very suitable for consumption in properly-constructed lamps.

The residue, after distillation of the more volatile fluids in coal-tar, is called *Pitch, or Dead Oil*, to burn which a lamp was invented by Mr. Beale; but we allude to it here as the source of the remarkable substance called *Paraffine*. After being twice distilled, and steam driven through the product to expel the naphthaline, the oil is mixed with sulphuric acid and thoroughly incorporated in a kind of churn. The oil is washed with water, after the acid has been removed by subsidence, and then churned with caustic alkali. Again, washing and distilling, until the products are obtained pure, the paraffine is at last procured by submitting them to cold, when it crystallises. These crystals are purified by pressure and a repetition of the above processes.

The solid substance thus obtained is admirably adapted for making candles, some of which were exhibited in the House of Lords by the Earl of Shaftesbury, when alluding to the prospect they held out of converting the Bogs of Ireland into a source of occupation and wealth for the inhabitants of the Emerald Isle. It contains only carbon and hydrogen, and has the same composition in 100 parts as olefiant gas, to which our coal and oil gases owe so much of their illuminating power. How nearly has Young realised the problem which the rare sagacity of the distinguished German chemist, Liebig, pointed out nearly ten years ago in his "Familiar Letters," where he says, "It would certainly be esteemed one of the greatest discoveries of the age, if any one could succeed in condensing coal-gas into a white, dry, solid, odourless substance, portable and capable of being placed on a candlestick, or burned in a lamp." We believe that our prolific science of chemistry justifies us in looking forward to the time when we may see on our tables the *white solid coal-gas candle*.

There are numerous other plants yielding oils, butters, and wax, but which have not yet attracted much attention, and which we must omit from so brief a sketch as the present survey of the vegetable products employed for lighting, either as candles or in lamps, but proceed to those having their origin in the animal kingdom.

8. *Train Oil*.—What associations cluster round the locality whence this oil comes,—the stirring scenes of the skill and dauntless courage of our seamen, as they pursue the huge leviathan of the deep, amid icebergs and billows,—a locality, too, which has proved the grave of the noble Franklin with his companions in misfortune.

“Where sleep they, Earth? By no proud stone
 Their narrow couch of rest is known;
 The still, sad glory of their name
 Hallows no mountain unto Fame;
 No!—not a tree the record bears
 Of their deep thoughts and lonely prayers.

Yet what if no light footsteps there
 In pilgrim-love and awe repair:
 So let it be!—like him, whose clay
 Deep buried by his Maker lay,
 They sleep in secret,—but their sod,
 Unknown to man, is marked by God!”

The east shores of Greenland, Davis' Straits, the interior of Baffin's Bay, and the newly-discovered inlets and seas of Collinson and M'Clure, are the seats of the Northern whale-fishery. It is unnecessary to detail the capture of the whale and the packing of the blubber in casks, in which an incipient decomposition of the animal matter attached to the blubber takes place during the voyage. This decomposition occasions the formation of a peculiar fat, composed of *phocenic acid* and oxide of glyceryle, to which is due the nauseous odour accompanying all train-oil. The cellular

tissue is thus so disintegrated that the oil runs off at once, and the whole is emptied into casks with wirework bottoms. When heated to 212° , the impurities in suspension separate more easily. They do not consist of mucus, but animal gelatine or glue, and some volatile stinking matter. Instead of heat, it has been proposed to employ tannin or metallic salts to precipitate them, but the nauseous odour is best removed by bleaching-powder.

On the western coast of Ireland, the basking shark is captured, and a large quantity of excellent oil obtained from the blubber.

9. *Seal-oil* is one of the most important productions of Newfoundland. The *pelts* of the seal, consisting of the skin and fat which surround the whole body, are removed while the animal is warm. They are allowed to cool on the deck, and then stowed away in the hold, in which state they reach the shipping ports, the principal of which is St. John's. The fat is removed by the hand from the skins, which, after being dry-salted for about a month, are shipped to Europe.

The fat is thrown into large vats, and the pressure of the mass gradually forces the oil through apertures in the sides. The first runnings are clear and possessed of little smell; they are termed *Pale Seal-oil*. Decomposition sets in at the end of two or three months, by which time from 50 to 70 per cent of the whole produce has been obtained. The whole putrid mass is turned, the upper portion of one vat being thrown to the bottom of another, and a brown oil of a most offensive character is produced. When the brown oil ceases to run, the contents of the vats are boiled in large iron pans, and the produce of this last operation is called *boiled seal-oil*. Mr. Archbold has introduced some important improvements in *rendering* seal-oil, by which the time necessary for the operation is reduced from six months to about twelve hours.

10. *Tallow*.—In the animal body there exists a peculiar

skin-like tissue, filling up the interstices between the different organs and surrounding them in all directions, which is called the *cellular tissue*. In certain places in the caul, for instance, the single cells are loaded with the fat, which, in the form of small drops, swims in the animal fluid, with which the cells are filled.

In ruminating animals, the firm, and at ordinary temperatures, solid nature of the fat, is characteristic. Ox-tallow was, until recently, the only source of lighting material; but Australia now exports a large quantity of mutton-tallow. The cattle fed on dry fodder yield the most solid tallow, which is one reason of the superior quality of that which comes from Russia.

The melting and purification of tallow are generally accomplished by the agency of heat alone. The cells burst by the expansion of their fluid contents,—the particles of skin appear hard and baked, and by moderating the heat the fluid fat collects at the top, when it is removed and pressed into blocks. The residue after pressure, called *greaves*, is used for feeding dogs. Many objections exist to this mode of rendering tallow, from the impossibility of maintaining a uniform heat and the evolution of inflammable animal matters. D'Arcet suggested the employment of weak sulphuric acid, which, by means of steam, applied externally as a source of heat, or internally among the melting mass, is perfectly successful. Morfit speaks well of an American plan used by Wilson and Co., who employ steam of high pressure.

But the most of the tallow of commerce cannot be used by the candle-makers without being purified, which process is called *clarification, or rendering*. It consists simply in re-melting the tallow with some clarifying substance, which seems to vary with each locality, for saltpetre, sal-ammoniac, common salt, alum, Epsom salts, &c. &c., are all employed for this purpose.

11. *Spermaceti*.—In some of the larger Cetacea, particularly in the white whale of the South Seas, there are peculiar cavities in the bones of the skull filled with a kind of blubber, and this oily fluid, when left to stand, begins to deposit small crystalline laminæ—*spermaceti*—in large quantities. The name is derived from an erroneous opinion that this substance is the spawn of the whale tribe.

The crude oil is placed in a cistern, below which a number of bag-filters are arranged, the upper parts of the bags being connected by a pipe with the oil cistern. The pressure of the oil forces the fluid sperm oil through the filter, and the solid fat remains. This operation is called *Bagging*. The bagged sperm is placed in cloths and submitted to heavy pressure, which removes the greater portion of the oil. The pressed sperm is melted, allowed to crystallise, and the crystals again placed in the press, which is now worked with a force of several hundred tons. The cakes are melted again, and boiled with a strong solution of caustic potash or soda, which saponifies any adhering oil without acting upon the spermaceti. The melted fat is crystallised in tin moulds, and once more submitted to the usual hot pressure, again boiled with the alkaline ley, and at last solidified in blocks for sale.

The substance is a very complex body, and we add the following table more by way of illustrating at sight the character of these compounds, than for any interest it possesses for the general reader:—

Stearate of oxide of stetyle	C ₃₆ H ₃₅ O ₃ + C ₃₆ H ₃₇ O
Palmitate of oxide of stetyle	C ₃₂ H ₃₁ O ₃ + C ₃₆ H ₃₇ O
Myristate of oxide of stetyle	C ₂₈ H ₂₇ O ₃ + C ₃₆ H ₃₇ O
Laurostearate of oxide of stetyle ..	C ₂₄ H ₂₃ O ₃ + C ₃₆ H ₃₇ O
Stearate of oxide of cetyle	C ₃₆ H ₃₅ O ₃ + C ₃₂ H ₃₃ O
Palmitate of oxide of cetyle	C ₃₂ H ₃₁ O ₃ + C ₃₂ H ₃₃ O
Myristate of oxide of cetyle	C ₂₈ H ₂₇ O ₃ + C ₃₂ H ₃₃ O
Laurostearate of oxide of cetyle ..	C ₂₄ H ₂₃ O ₃ + C ₃₂ H ₃₃ O

12. *Bees'-wax* is the substance which constitutes the cells of the bee-hive, and is secreted by an organ situated in the abdomen of the bee. The farina serves as food for the larvæ of the insect, while the wax is produced from the honey, for which it ultimately serves as a receptacle. The wax oozes out through the sacs where it is secreted, and is worked by the insect with its mandibles and proboscis, first into the form of a riband, which, being softened with a frothy kind of liquid, making it white and ductile, is ultimately formed into cells.

The *honeycomb* having been secured, the *virgin-honey* is allowed to flow out, and the remainder is removed by pressure. When the pressed comb is melted in boiling-water and allowed to cool, the *wax discs* are obtained which are met with in commerce. The crude wax from the comb is repeatedly melted, and passed through hair bags into cold water. It is finally melted and poured into conical moulds.

The destruction of the foreign matters in wax is effected by the aid of bleaching agents. It is first melted with diluted sulphuric acid, which renders it darker coloured, but very clear and translucent. It is again melted with a dilute solution of bleaching-powder, when a thick soapy mass is produced, from which weak muriatic acid separates the wax as a colourless fluid, which comes to the surface and solidifies to a perfectly white disc. The wax bleached in this way is said not to retain its whiteness, and that bleached by the sun's rays is preferred by the wax-chandlers.

Pure wax is a compound of two fatty bodies, one soluble in alcohol, called *Cerotic Acid* ($C_{54} H_{54} O_4$), and another insoluble in alcohol called *Myricine*, which contains palmitic acid in combination with a substance called Oxide of Mellissyl. Brodie has succeeded in making two new solid hydrocarbons from these bodies very similar to paraffine.

13. *Chinese, Japan, or Insect-wax*, has entirely superseded the use of bees'-wax in China, being the produce of the white-wax insect, which is supposed to feed upon an evergreen shrub, the *Ligustrum lucidum*. Much attention is paid to the cultivation of this plant, and it forms in China an important branch of agricultural industry. It is stocked with the insect three or four years after planting. The nests swell in a few days after being tied to the branches; and innumerable white insects emerge and spread themselves over the plant, but soon descend to the ground, where, finding no congenial resting-place, they reascend and fix themselves to the lower surfaces of the leaves. After some days they repair to the branches, and perforate the bark, to feed on the fluid within. Early in June the trees present the appearance of being covered with hoar-frost, being, as the natives say, "changed into wax." Soon after the wax is sprinkled with water, scraped from the trees, and spread on a strainer, covering a cylindrical vessel, which is placed in a caldron of-boiling-water. When congealed it is ready for market, and is perfectly white, translucent, shining, with a crystalline surface, like spermaceti, and not unctuous to the touch. It is composed of *Cerotic Acid*, combined with *Oxide of Ceryle*. The annual value of the produce of this small creature is said to be 1,000,000 Spanish dollars.

T. R.

(*To be continued.*)

THE SHIPWRECK OF ST. PAUL.

CANTO II.

WHERE the northward sweeping sea
Presses close with swelling breast
On the shrinking shores of Crete,
Drawing back from the south-west,
There the Paximades* rest:
There those islands lie like emeralds
Set within a shield of gold;
Or, rather, zoned with greenest kirtles,
As the Naiads were of old,
Within the ripples cold
They bathe their silver feet,
Silver feet of silvery sand,
And watch their own smiles in the water:
Thus the Paximades stand;
And above, a flowery band
Binds their foreheads, white with sunshine,
Whence the trailers floating go
To rest upon their gleaming shoulders,
And melt into the hazy woods below.

A bright speck twinkled in the east
Upon the dim sea-line;
Slowly it steadied and increased
Till white wings 'gan to shine.
As silent as a dream that glides
Into the world of sleep,
It rose upon the shining sides
Of the huge rounded deep.

* Letoa, the principal island of this group, is the only one marked in ordinary maps, lying in the bay formed by the south-western coast of Candia.

Now nearer yet begin to show,
The bright above, the dark below,
The sails that glitter in the sun,
The leeward hull in shadow dun ;
With measured movement, swinging deep,
A hundred oars the waters sweep ;—
All at a stroke, with sullen dash
 They plunge into the main ;
 All at a stroke they rise
Fringed with cascades of diamonds,—flash
 Against the curving skies,
 And fall and rise again.
Nor yet the favouring south wind fails,
But hotly breathes upon the sails,
As panting up from Libyan sands,
It wings its way to cooler strands.

What anguished thoughts are casting now
Their shadows over Julius' brow ?
The breeze blows fair,—in one short hour
The doubt, the risk, the peril o'er,
Safe in Phenice's vaunted sound
Their anchors clip good holding-ground.
But what are winds, or fair or foul,
In that stern crisis of the soul,
When faith and life—despair and death,
Seem hung upon a moment's breath ?
When that great problem, "What is truth ?"
Vast with a thousand ages' growth,
Blocks up all life, chokes earth and heaven,
Until the talisman be given,
And the enormous doubt must shrink,
Condensed to form, and either sink

Blinded and grovelling to the sod,
Or mount on faith's swift wings to God.

His latest, strongest trust of all,
Hangs trembling on the truth of Paul ;
And if that boding prophecy
Of "hurt and damage" prove a lie,
Then helpless on life's stormy main
His shattered soul must toss again.

And thus before the south wind fair
He drifts to ruin and despair :
Thus the broad-smiling, sunny sea
But mocks his last extremity ;
And if the ship sweep safely round
Within Phenice's vaunted sound,
Then, wrecked upon a fatal coast,
His dearest venture will be lost.

'Tis hard for us, whose earliest youth
Has basked in the full light of Truth,
That from the zenith pouring free
Lights friend and foe impartially,—
'Tis hard to picture how, with eyes
Of eager, earnest, strained surprise,
Souls that desire of Truth had stirred,
Sick with the pangs of hope deferred,
Sad-wandering in the uncertain gloom
That shrouded ancient Greece and Rome,
Watched the first tints of morning rise
Slow reddening in the eastern skies,
And saw the sanguine glory swim
Above the horizon's distant brim.

Since the ship left the Syrian shores,
The vacant, slowly-floating hours

Saw the Centurion often stand
Conversing with the prisoner-band.
He heard them give in words of flame
His soul's unuttered wants a name,
And when the mighty Sacrifice
Stood forth to his adoring eyes,
Spontaneous faith, and love, and joy,
Told him it could not be a lie.
The vaguely-fluttering desire,
 That, often loosed before in vain,
Flew from his soul on wings of fire,
 And, disappointed, turned again,
Now scents at last the solid shore,
And speeds forth to return no more.

As one that searched, all dreamy-eyed,
For his unknown, dear, destined bride,
Fancied her found in each fair maid,
Again and yet again betrayed :
So, blindly seeking, Julius strove
To find the bride his Soul could love.
The common Faith came swimming by,
With fair, fresh face, sweet to the eye ;
But as he turned to gaze and follow,
A skeleton obscene and hollow
Was all he saw,—and in its train
Gods cruel and impure as men.
As his indignant soul withdrew,
A nobler vision met his view :
One that, with chaste ethereal mien
 And disregardful eyes,
Sat throned in thought, the musing queen
 Of pure philosophies,
Conversing with the silent skies.

His longing soul with reverence shook,
And as he marked her absent look,
Unconscious of the love he bore,
He worshipped and he loved the more.
His soul, drunk with her beauty, cried,
"Thou art my long-sought, destined bride!"
But yet she stirred not at his call,
Nor let her lifted eyelids fall:
He sprang to clasp her as his own,
But at his touch the glorious One was gone,
Dissolved in air, and he was left alone.

And many years went slowly by,
And his tired soul dragged heavily:
Earth's glowing joys came one by one,
 Its griefs their shadow made;
There seemed no purpose in the sun,
 No meaning in the shade,
Sowing till eve from morning prime
Without a hope of harvest time.
But souls that long for heavenly bread
Sooner or later shall be fed,
And all who worship Truth concealed
Shall one day worship Truth revealed.
So, worn with waiting, sad and tired,
He found her whom his soul desired:
Her clear credentials met his eye
Bright with historic certainty,
But deeper sunk within his heart
A dearer proof than these impart,—
That pure and warm response, till then
Though often sought, yet sought in vain.

But with flush of shame-faced fear
Fancy lays down her pencil here:

Her palettes, bright with mortal hues,
To yield immortal tints refuse :
And those who know Truth's glorious face,
Need not an artist's hand to trace
Her beauty, as she rose in light
On Julius's adoring sight ;
And for the rest, — a seraph's strain
Of rapt eulogium were in vain.

When the starved wretch at length is fed —
Doubts he the virtue of his bread ? —
When the poor thrall is set at large,
Say, does he question his discharge ?
And when returning exiles come
And fall upon the breast of home,
While sobs of joy are bursting round,
Oh, do they doubt that home is found ?

So when the glad Evangel came
And snapped his bonds with words of flame ;
When all his longing soul was fed
And satisfied with heavenly bread ;
When, weary leagues of exile passed,
He gained his spirit's home at last,
And there at length found by his side
Truth, his long-sought-for, destined bride, —
Oh, when at length her calm sweet look
Like moonlight o'er his darkness broke,
Then love's deep ocean swelled and shone,
And circled round her rising throne.

So for a while the conquering Light
Drove back the flying shades of night ;
But soon an ambushed cloud arising

While starry watchers slept,
 Between their bright ranks crept,
 The silver citadel of heaven surprising,
 And the clear edges of her crystal wall
 Sank indistinct beneath the sombre pall.

For with that first fond jealousy
 That cannot brook suspicion's eye,
 He feared to trust the Truth he loved, —
 So long concealed, so lately proved, —
 He feared to trust her forth at large
 Within her own all-powerful charge,
 And so built barriers to shut out
 The contact of a single doubt.
 When, in Fair Haven's Bay, he heard,
 As from Her lips, Paul's boding word;
 Within his inmost soul he knew
 The Heaven-sent warning must be true.
 But if, obedient, he should stay,
 And winter in Fair Haven's Bay,
 And all went well, — yet still perforce
 The danger of the other course
 Were left unproved to all the crew,
 Whose scornful disbelief he knew.
 And then his loathing fancy drew
 The lifted brows, the curling sneer,
 With which his guards the order hear.
 So, self-deceived, his faith sank down, —
 Fearing to trust the Strong alone,
 Striving, in fond and foolish ruth,
 To shield invulnerable Truth, —
 His own unguarded heart became
 A prey to doubts he dared not name.
 Thus, ever, when the blade of Faith
 Is left concealed within the sheath,

Not only is the mightiest sword
 Missed from the battle of the Lord,
 But with foul rust and dull decay
 It slowly eats itself away.

Such anguished thoughts are casting now
 Their shadows over Julius's brow:
 He stands beside the plunging prow,
 And his keen eyes scan eagerly
 The aspect of the northern sky;
 But the lips' sharper outlines show
 Chiselled by strange contempt and woe,
 As if the muscles hardened there
 To battle with a last despair.

F. A. P.

THE PSALMIST.

FROM THE GERMAN.

THE royal psalm-singer had just sung to his Deliverer one of his beautifullest hymns, and still the holy breath was stirring in his harp-strings as Satan stood up to tempt him—to incline his heart to pride on account of his goodly songs. “Hast Thou, O Almighty,” he said, “among all Thy creatures one who can praise Thee more sweetly than I?”

Then in through the open window, before which he had spread forth his hands, there flew a tiny grasshopper and settled on the hem of his robe, and began to raise its clear, shrill morning-song. A multitude of grasshoppers assembled forthwith around. The nightingale came flying to

join them, and in a little while all the nightingales were concerting with one another in the praise of the Creator.

And the ear of the king was opened, and he understood the song of the birds, the voice of the grasshoppers, and of all living, the murmur of the brooks, the rustling of the groves, the music of the morning-star, the ravishing strain of the rising sun.

Lost in the high harmony of the voices which, unceasing and unwearied, praise the Creator, he was silent, and found that, with all his lofty minstrelsy, he must stand behind the grasshopper, which sat chirping on the hem of his garment. Humbly he seized his harp and sang, "Bless the Lord, all ye his works in all places of his dominions: bless the Lord, O my soul!"

REVIEW OF THE MONTH.

THE promises of our London publishers for the forthcoming season are not particularly exciting. In the meanwhile a few works of solid value are from time to time making their appearance, and, which is hardly less important, new editions re-written or re-modelled of standard books. The Rev. H. Alford has issued a third volume of his "Notes on the Greek Testament," and Professor Edward Robinson has published an additional volume of "Biblical Researches in the Holy Land." We have a revised and extended reprint of Prichard's "Natural History of Man;" and in four huge volumes, aided by Dr. Tregelles and Professor Davidson, the venerable Hartwell Horne has brought out an entirely new edition of that great storehouse, his "Introduction to the Critical Study of the Holy Scriptures."

There are few subjects on which we more desiderate a

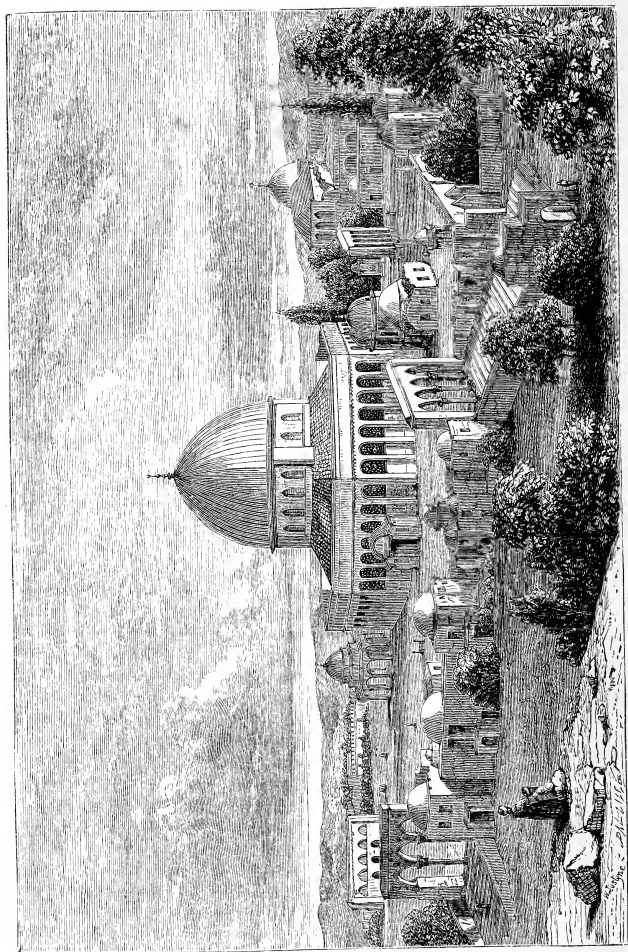
sound and sober theology, and on which we should be more grateful for a lively personal consciousness, than that indwelling and in-working of God's Spirit which form so conspicuous a promise to the New-Testament Church, and which were so largely enjoyed in the primitive time. We were therefore prepared to give a special welcome to two little volumes which have lately come in our way: the one anonymous, "The Comforter; or, Joy in the Holy Ghost: A Word for the Restless;" the other by the Rev. W. Arthur, "The Tongue of Fire; or, the True Power of Christianity." The former we do not like the less because it raises some questions which we are not prepared at once to answer in the way which the author indicates. It is the work of a deep and independent thinker, and contains much that is true and beautiful. Mr. Arthur's book conveys in glowing language a large fund of Scriptural truth and profound philosophy. Thoughtful men will find it an instructive treatise, and from the intense earnestness with which it is written, we trust that it is destined to quicken the piety of many private Christians and to kindle afresh the fervour of many preachers.

Mr. Gosse has published the second and concluding part of his "Manual of Marine Zoology for the British Isles,"—a little work which will answer every purpose of the collector who cannot afford many and costly books; and which contains not only a description, but a drawing of almost every creature which the explorer of our coasts is likely to find. The Society for Promoting Christian Knowledge is making very spirited efforts to supply the public with entertaining introductions to science. Two of these are now before us,— "Wanderings through the Conservatories at Kew," and "Light: Its Nature and Applications." This last contains a clear and excellent account of photographic processes, and both volumes are illustrated in a superior style of art, and

are admirably adapted for village libraries. "Marion Falconer; or, Stars in the Darkness," by E. H. W., is a tale of much depth and genuineness,—lively and pathetic by turns, and far better written than tales of good intention usually are.

Our attention has been recalled to a volume of poems by Mr. A. Carlile, which we ought to have noticed a year ago. It is a work of real merit. In an age of more leisure a didactic poem like "The Deity in Man" would have made its author famous. But whatever may be the amount of their popularity, the author must have already found a rich reward in his own noble sentiments and beautiful imaginings.

It is seldom that the musical world appeals to our critical judgment, perhaps because we are not easily pleased. We are, therefore, all the happier in being able to give our hearty and unhesitating verdict in favour of Mr. Wrighton's Songs. Nothing can well exceed the popularity of "The Postman's Knock;" but it is in compositions of a different strain in which he has chiefly appeared of late, and we know few effusions which in tenderness and melody surpass "Like a Flower," or "As one by one our friends depart." It is enough to say, that "Smiles and Tears," "On the Banks of a beautiful River," "Her sweet Smile haunts me still," are rich in that music, which does not merely play upon the ear, but which penetrates the heart and sets the better thoughts a-going.



The Mosque of Omar, Jerusalem.

THE MOSQUE OF OMAR.

THE land of Moriah witnessed the most wonderful act of faith which human nature has ever been enabled to exhibit. There Abraham, at the command of God, showed himself willing to offer up a son whom he not only loved with fondest affection, but whose preservation he had learned to regard as essential to the welfare of the world. Such was his confidence in the faithfulness and power of the Most High that, rather than allow the promise to be falsified, "In Isaac shall all nations be blessed," he believed that God would restore his son from the ashes of the altar.

Abraham was the Father of the Faithful, and this was the crowning act of Abraham's faith. But solemn as was the spot where that altar was built, and where that unprecedented victim was bound, and sacred as were the recollections of the Angel-Jehovah's appearance,—“By myself have I sworn, saith the Lord, because thou hast done this thing, and hast not withheld thy son, thine only son; that in blessing I will bless thee, and in multiplying I will multiply thy seed as the stars of the heavens, and in thy seed shall all the nations of the earth be blessed,”—ages appear to have elapsed before any special sanctity was attached to the locality. When at last the stronghold of Zion became the capital of the Holy Land, it would seem that the hill of Moriah was a farm still occupied by a Canaanite family, and as the best place for catching any passing breeze, they used as a threshing-floor the summit, or one of the rocky projections, of the mountain, which became well known as “the threshing-floor of Araunah the Jebusite.” On that mournful occasion when David had committed a trespass in numbering the people, and when seventy thousand of the inhabitants perished as a rebuke to the ambitious projects of

their ruler, it was at the threshing-floor of Araunah that the destroying angel staid his hand and the pestilence ceased. Consequently, and in obedience to a divine command, on this spot David erected an altar, and on it presented burnt-offerings and peace-offerings. There is every reason to suppose that the altar stood throughout the remaining days of King David, and it is not wonderful that with its twofold association, as the scene of Isaac's virtual sacrifice and the spot where the pestilence was so mercifully arrested, David should have selected the locality as the site of his projected Temple. That Temple David was not permitted to rear; but at the outset of the reign of his successor we read, "Then Solomon began to build the House of the Lord at Jerusalem in Mount Moriah, where the Lord appeared unto David his father, in the place that David had prepared in the threshing-floor of Ornan (or Araunah) the Jebusite." *

As the rocky surface of Moriah slopes rapidly towards the south, much labour must have been expended in leveling it, so as to secure an area extensive enough for the magnificent house builded by Solomon. Nor only this; but there is every reason to believe that even as early as this first Temple were those substructions commenced which encroached on the valley of Kedron, and which not only extended the consecrated limits, but added exceedingly to the grandeur and impressiveness of the entire elevation as viewed from without.

Solomon's Temple, after standing four centuries, was burned down by Nebuchadnezzar, and seventy years afterwards a second but less sumptuous shrine was erected in the same locality by Nehemiah. This second structure stood for five hundred years and upwards, when, by a process of gradual reconstruction, it was replaced by Herod the Great;

* 2 Chron. iii. 1, compared with 2 Samuel, xxiv. 15-25.

whose third and splendid temple was hardly completed when the torch of the frantic Jews and the crowbars of the conquering Romans laid it in ruins.

In the year 636, the Caliph Omar, the third in succession from Mahomet, took Jerusalem. On the site of the Temple he built a small but elegant mosque, — an octagon, each side of which measures sixty-seven feet, and which is still known by his name. He also enclosed the area which, we may assume, constituted the precincts of the original Temple, probably adding a dome to a Christian church which he already found there, and which is now known as the little mosque of El Aksa.

At the end of the eleventh century the Crusaders took Jerusalem. Great numbers of the Moslems sought refuge in the hallowed precincts, but found there no asylum. Ten thousand were put to the sword, and the same slopes which had once been heaped with slaughtered Jews now flowed down with the blood of Saracens.

The turn of the Christians came next. Godfrey, the first Christian king of Jerusalem, converted into a church the Mosque of Omar, and for nearly a hundred years a golden cross glittered on the summit of the handsome dome. But, under the irresistible Saladin, the Moslem once more recovered possession. The golden cross was hurled from its elevation, and contemptuously dragged through the streets; and, when floods of rose-water had washed out the taint of Nazarene footsteps, the floor swarmed, as of old, with the followers of the false Prophet.

Ages on ages have elapsed, during which no Frank has been allowed to penetrate the awful shrine. The attempt would have been certain destruction; and it is said that more than one life has paid the forfeit of its hardihood.

However, in the year 1818, Dr. Robert Richardson, in consequence of professional services rendered to the Governor of Jerusalem, was allowed to pay no fewer than four visits

to the holy place, and of his minute explorations he soon afterwards published an interesting account. His precedent was followed in 1833 by Messrs. Bonomi and Catherwood,—the former of whom was indebted for his safety to his command of the Arabic language, whilst the latter, for six weeks together, enjoyed free ingress and egress from an impression which had gone abroad that he was an “effendi” sent by the Pasha of Egypt to make drawings with a view to a general repair of the building. Within the last two years, however, owing to the desire of the Turkish authorities to oblige the French and the British, as well as through the gradual softening-down of Moslem fanaticism, the gates of the sanctuary have opened to many visitors, and the interior may be regarded as one of the established sights of Jerusalem; and no doubt we shall learn many interesting particulars from the forthcoming works of Dr. Bonar and other travellers.

Under the dome of Omar’s Mosque is a remarkable limestone rock. “With its irregular form,” as Mr. Catherwood states, “it occupies the greater part of the area beneath, and is surrounded by a gilt iron railing, to keep it from the touch of the numerous pilgrims. It appears to be the natural surface of the rock of Mount Moriah: in a few places there are marks of chiselling. Over this hangs a time-worn crimson silk canopy. At the south-east corner of this rock is an excavated chamber, called by Mahomedans the Noble Cave, to which there is a descent by a flight of stone steps. This chamber is irregular in form, and its superficial area is about 600 feet, the average height seven feet. In the centre of the rocky pavement is a circular slab of marble, which, being struck, returns a hollow sound, clearly showing that there is a well or excavation beneath.” The general opinion is that this rock,—known among the inhabitants of modern Jerusalem as “Kubbet es Sukrah,” and by Mahomedans held in veneration only second to the

famous Caaba at Mecca,—is the identical threshing-floor of Araunah, and the spot on which David erected his altar, and over which it is not improbable that the Holy of Holies afterwards stood. The Jews have an impression that the Ark of the Covenant is still concealed somewhere under the floor of this Mosque; and although no one who recalls the Arch of Trajan will attach much importance to this notion of theirs, it is by no means unlikely that were the “Bir arruah,” or “Well of Souls,” examined, it would be found to contain objects of deep interest. To say nothing of vessels, &c., which may have accidentally fallen into it, and which a deep draw-well was not likely to restore, it seems only natural to suppose that in the case of a sudden surprise the priests may have intrusted to its guardianship spoils which they were reluctant should fall into the hands of the enemy.

The Mosque of Omar, with its double dome and its various-coloured marbles, is a building of great beauty. As described by the visitor, its corridors within are “airy, light, and elegant, and the sun, streaming through the richly-stained glass windows, casts a thousand varied dyes upon the highly-decorated walls and marble pavement. In striking contrast to this is the solemn and impressive appearance of the dome: the eye in vain strives to pierce its gloom, to unravel its maze of rich arabesque ornaments, and read its lengthened inscriptions drawn from the Koran. In perfect keeping are the groups of pilgrims and devout Mussulmans from all parts of the Mahomedan world, from India to Morocco. Their picturesque variety of dress and feature, their deeply devout deportment, as, headed by dervishes in green robes and high conical caps, they silently prostrate themselves in prayer, thankful to have attained the term of their weary pilgrimage, are very striking.” J. H.

LIFE, IN ITS HIGHER FORMS.

No. V. (*continued*).

MAMMALIA.

It has been a question among zoologists whether or not Man ought to be considered as an animal, and to take his place in the System of Nature with a generic and specific name. Some have decided in the affirmative, as Linnæus, who places *Homo sapiens* at the head of his *Primates*, and Cuvier, who creates an order, "*Bimanes*," for the express reception of the human species. Others, as Aristotle, Ray, and Swainson, exclude him from their systems, and refuse to assign him a zoological place. The grounds of this exclusion are tersely expressed by the present Archbishop of Canterbury, in the following words: "There is nothing philosophical in the comparison of a being possessed of improveable reason with one that is governed by natural instinct, because there is no just affinity between the talents which are compared."*

We incline to think, however, that both these hypotheses are true. Man, in regard to his body and soul, is an animal, and is to be compared with other animals;—he is the highest form in the highest Class; while it is in regard to his spirit, the moral consciousness of responsibility, the principle which constitutes him capable of worshipping God, that he is separated from the brute creation, and placed *per se*. The contrast between Man and Beast is not a *contrast between reason and instinct*, common, and almost universal as is this supposition, for it can be readily shown that these two mental qualities, though very different, are by no means

* "Records of Creation," i. 13.

inseparable; that in point of fact the Dog is endowed with reason as well as instinct, and that Man performs many actions which are purely instinctive, as well as those which are prompted by reason. We shall presently adduce some examples in proof of the former of these propositions.

What is the nature of Spirit, or How that principle can be defined, by the possession of which Man is raised above companionship with the Ape and the Dog, is a question which we will not attempt to answer. "In the image of God made He man." The Creator, who spoke all other terrestrial existences into being by His almighty Word, condescended to "breathe into the nostrils" of Man, whom He had formed out of dust, "the breath (or spirit) of life." Thus his spiritual part was a direct emanation from the Deity, who had respect to the wondrous plan, devised before the foundation of the world, whereby the creature Man was to be brought into the closest union with Himself. Here is the true dignity of Man: it is not that he is a reasonable being; it is not that he is a moral being; but it is that by an act of stupendous grace his being has been shared by the everlasting God, who became partaker of his flesh and blood,* in order that he might become a partaker of the Divine nature.† Behold! what manner of love the Father hath bestowed upon us, that we should be called the sons of God!

To some it may appear strange that we should consider the possession of *a soul*, as well as a body, common to the Brutes with Man, and may possibly startle even some who do not fall into the general mistake of confounding the soul with the spirit. Yet it is evident that the inferior creatures do manifest mental attributes. "The phenomena," observes Dr. Prichard, "of feeling, of desire and aversion, of love and hatred, of fear and revenge, and the perception of external

* Heb. ii. 14.

† 2 Pet. i. 4.

relations, manifest in the life of brutes, imply, not only through the analogy which they display to the human faculties, but likewise from all that we can learn or conjecture of their particular nature, the superadded principle, distinct from the mere mechanism of material bodies. That such a principle must exist in all beings capable of sensation, or of anything analogous to human passions and feelings, will hardly be denied by those who perceive the force of arguments which metaphysically demonstrate the immaterial nature of the mind.”*

Instinct has been defined † as a natural impulse to certain actions which animals perform without deliberation, and without having any end in view, and without knowing why they do them. It differs from intellect in the unerring certainty of the means it employs, the uniformity of its results, and the perfection of its works prior to, and independent of, all instruction or experience; and lastly, by the pursuit of nothing beyond what conduces directly either to the continuation of the individual or the propagation of the kind. But the arts of rational creatures proceed slowly through diversified and oft-repeated experiments, while the means they employ are always various, and seldom the best and most appropriate. ‡

Assuming the correctness of this diagnosis, let us examine the source of the actions recorded in the following anecdotes :—

“The battering-train going to the siege of Seringapatam, had to cross the sandy bed of a river that resembled other rivers of the Peninsula, which leave, during the dry season, but a small stream of water running through them, though their beds are mostly of considerable breadth, very heavy for draught, and abounding in quicksands. It happened

* “Nat. Hist. of Man.”

† Beattie, “Mor. Sci.” I. ii. § 8.

‡ “Penny Cyclop.” xii. 497.

that an artilleryman, who was seated on the tumbril of one of the guns, by some accident fell off, in such a situation that in a second or two the hind-wheel must have gone over him. The Elephant, which was stationed behind the gun, perceiving the predicament in which the man was, instantly, without any warning from its keepers, lifted up the wheel with its trunk, and kept it suspended till the carriage had passed clear of him.”*

“ While an old man was wandering by the side of one of the largest tributaries of the Almand, he observed a Badger moving leisurely along the ledge of a rock on the opposite bank. In a little time a Fox came up, and after walking for some distance close in the rear of the poor Badger, he leaped into the water. Immediately afterwards came a pack of hounds at full speed in pursuit of the Fox, who by this time was far enough off floating down the stream, but the luckless Badger was instantly torn to pieces by the dogs.”†

“ A gentleman was engaged in the amusement of coursing, when a Hare, closely pressed, passed under a gate, while the dogs followed, by leaping over it. The delay caused to her pursuers by this manœuvre seems to have taught a sudden and useful lesson to the persecuted creature, for as soon as the dogs had cleared the gate and overtaken her, she doubled and returned under the gate as before, the dogs again following and passing over it. And this flirtation continued backwards and forwards until the dogs were fairly tired of the amusement, when the Hare, taking advantage of their fatigue, quietly stole away.”‡

Of Dogs numberless well-authenticated stories are on record (and almost every one can add to the number from

* “ Twelve Years’ Military Adventure.”

† “ Zoologist,” ii.

‡ Loudon’s Mag. N. H., iv.

his own circle of information or observation), which indicate a comparatively high degree of reasoning power. Who has not observed the intelligence of those Dogs which lead the blind through crowded thoroughfares and dangerous places, always awake, not to their own comfort, but to the safety of their unconscious masters? Montaigne has seen one of these Dogs along the ramparts of a town leave a smooth and uniform path, and take a worse, in order to lead his master from a too close proximity to the edge.

M. Fred. Cuvier, in his highly interesting description of an Orang, brought to France by M. Decaen, makes the following statement. After alluding to its love for its owner, he says: "This principle of affection generally induced our Orang to seek the society of those persons with whom it was acquainted, and to shun solitude, which was at all times displeasing to it. On one occasion it exhibited for this purpose a very remarkable degree of intelligence. It was kept in a small room off a large saloon, usually occupied by the members of the family, and had frequently been observed to mount a chair which stood contiguous, for the purpose of unbolting the door and joining the rest of the company. At length the chair was removed to a distant corner of the room for the express purpose of preventing the intrusion; but scarcely had the door been shut than it was again opened, and the Orang was seen in the act of descending from the identical chair, which he had carried back again to its old situation, to enable him to mount up to the height of the bolt. It is certain that the animal had never been taught to act in this manner, nor had he ever seen others do so; the whole affair was the result of his own natural reason, and differed in no respect from what a human being would have done in like circumstances."

And is not this a legitimate deduction? and will it not apply to all the examples we have enumerated, and

to thousands of others? The Elephant had never been *taught* to lift wheels when they threatened to crush fallen men; nor the Fox to transfer his own peril to a stray Badger; nor the Hare to run to and fro under a gate; nor the blind man's Dog to give a wide berth to the rampart's verge. The actions were not the results of education, of habits induced by training. Neither were they, or any of them, marked by "unerring certainty in the means," or "uniformity in the results," nor can it be said that they were "performed independently of all experience:" they differed *in toto* from instinctive actions. Every one of them indicates a reasoning power, combining cause with effect, using the light of past experience, or perceiving the suitability of some resource to present emergency, and that, in one or two of the cases, as in those of the Fox and the Hare, with a sudden promptitude which in man would have been admired as presence of mind. Why should we hesitate to call it so here?

Instances are not wanting in which the inferior animals have manifested a capacity for comprehending some of the more abstract notions, such as time, number, and language,—notions which certainly have little in common with *instinct*. Southey, in "Omniana," mentions two Dogs which were able to count the days of the week. One of these, he says, belonged to his grandfather, and was in the habit of trudging two miles every Saturday to cater for himself in the shambles. "I know," he adds, "a more extraordinary and well-authenticated example. A Dog, which had belonged to an Irishman, and was sold by him in England, would never touch a morsel of food *upon Friday*."

"The Oxen that served in the royal gardens of Susa, to water them, and turn certain great wheels to draw water for that purpose, to which buckets were fastened (such

as there are many in Languedoc), being ordered every one to draw a hundred turns a-day, they were so accustomed to this number, that it was impossible by any force to make them draw one turn more ; but, their task being performed, they would suddenly stop, and stand still.”*

As proofs that Brutes can acquire some knowledge of human language, we may mention the following facts and anecdotes out of many. Mr. W. C. Martin says :—“ We have two Dogs, a spaniel and a terrier, both of small size ; and if, by way of trial, in the course of conversation we say, in the ordinary tone of voice and without looking at them, ‘ I am sure there must be a cat somewhere about the house,’ they are instantly excited, and search in every place for the animal, to which they bear instinctive hatred.”† Dr. Gall says that Dogs learn to understand not merely separate words or articulate sounds, but whole sentences expressing many ideas. In his treatise “ *Sur les Fonctions du Cerveau*,” is the following passage : “ I have often spoken intentionally of objects which might interest my Dog, taking care not to mention his name, or make any intonation or gesture which might awaken his attention. He, however, showed no less pleasure or sorrow, as it might be, and, indeed, manifested by his behaviour that he had perfectly understood the conversation which concerned him. I had taken a bitch from Vienna to Paris ; in a very short time she comprehended French as well as German, of which I satisfied myself by repeating before her whole sentences in both languages.”

Elephants habitually perform certain duties on the mere verbal promise of special rewards, which it would be very dangerous to withhold when the condition is accomplished.

* Montaigne’s “ *Essays*,” ii. 12.

† “ *Hist. of the Dog*,” 99.

But one of the most remarkable examples on record of this faculty, is the following story of a Spaniel, avouched by the personal knowledge of a zoologist of deserved reputation. "One morning, as the lady to whom the spaniel belongs was lacing her boots, one of the laces broke. She turned to the dog, and playfully said, 'Oh dear! I wish you would find me another boot-lace;' and having managed with the broken one, thought no more about it. On the following morning, when she was again lacing her boots, her spaniel ran up to her with a new silken boot-lace in his mouth; not only to her great amazement, but that of the family. Where the dog had obtained the boot-lace no one could tell; but, doubtless, he had purloined it from some workbox or similar repository."*

The same naturalist has mentioned several instances in which a communication was made by one animal to another of certain events that had occurred to the former, and of a definite and intelligent common action resulting.

Every observant reader must be aware that the Brutes—especially those which, being domesticated, come more frequently under our notice—display many of what, in ourselves, we call *moral* feelings or affections, whether good or bad; but, perhaps, all are not cognisant of the extent of the category. We could readily cite anecdotes to prove that love, hatred, jealousy, gratitude, pity, sympathy, faithfulness, obedience, sorrow, joy, pride, revenge, and even conscience of guilt, are attributes of the bestial, no less than of the human soul. Some of these are too commonly witnessed to need illustration, but we shall cite a few examples.

The affection of the Dog for his human friend is so

* Martin's "History of the Dog," 183.

fervent, so tender, that it is scarcely surprising that it should sometimes beget that horrid accompaniment—jealousy, with which in our nobler bosoms it is so often associated. Nor is it only of their own species that Dogs are jealous; any intruder that appears to share the regard which they had been accustomed to consider exclusively their own, becomes an object of fierce hatred. M. Blaze mentions a Dog which died of consumption, because its mistress received home an infant that had been put out to nurse. He growled whenever he saw her kiss the child. In 1841, a bull-dog in Paris flew upon and killed a child of six years old, in the arms of his mother; the only reason for this ferocity being that the little fellow had been in the habit of caressing another Dog in the sight of the savage animal, which had always, before this, been kept chained.

As to pride, it is well known in the East that the Elephant receives pleasure from his gorgeous trappings, and moves with a more stately step, and with manifest appreciation of his honours, when bedizened in scarlet and gold. Pliny relates that one of the Elephants of Antiochus, having been deprived of his silver ornaments for refusing to sound the depth of a river, rejected his food, and actually died under the sense of his disgrace.

The same intelligent creature shall afford us an illustration of sympathy, so strong as to overcome even the obedience habitual to the animal. Bishop Heber saw an old half-starved Elephant fall under his work, and being unable to rise, another of very large size was brought to assist him. "I was much struck," says the good Prelate, "with the almost human expression of surprise, alarm, and perplexity in his countenance, when he approached his fallen companion. They fastened a chain round his neck and the body of the sick beast, and urged him in all ways, by

encouragement and blows, to drag him up, even thrusting spears into his flanks. He pulled stoutly for a minute; but on the first groan his companion gave, he stopped short, and turned fiercely round with a loud roar, and with his trunk and fore-feet began to attempt to loosen the chain from his neck."

Dr. Abel, in his minute account of the manners of a Bornean Orang, speaks of the fits of passionate anger into which he would sometimes fall. "If repeatedly refused an orange, when he attempted to take it, he would shriek violently, and swing furiously about the ropes; then return and endeavour to obtain it: if again refused, he would roll for some time like an angry child upon the deck, uttering the most piercing screams, and then suddenly starting up, rush furiously over the side of the ship, and disappear. On first witnessing this act, we thought he had thrown himself into the sea; but on a search being made we found him concealed under the chains."

The worthy Doctor says that this act, in a rational being, would have been called the threatening of suicide. Was it anything else in this Ape? Was not the act evidently the result of a process of reasoning, founded on his observation of the value his master set on him, and comprehending the sorrow which the supposed loss would produce? The cautiousness which determined that it should be only a *deceptive* loss was a refinement of intellect, almost human; it reminds us of that inimitable line of Burns's—

"*Spak o' loupin' owre a linn.*"

A kindred animal—the Siamang—shall afford us an example of a mental principle very like conscience. The Dog and Cat, however, often display its workings as well. In Mr. Bennet's "Wanderings," there is an account of this

Ape, which he was keeping. In the cabin, there was a piece of soap, which had excited the Siamang's cupidity, and for the abstraction of which he had been several times scolded. One day Mr. Bennet, while engaged in writing, happened to see the Siamang engaged in his thievish practices. "I watched him," says the observer, "without his perceiving that I did so; he occasionally cast a furtive glance towards the place where I sat. I pretended to write; he seeing me busily engaged, took up the soap and moved away with it in his paw. When he had walked half the length of the cabin, I spoke quietly, without frightening him. The instant he found I saw him, he walked back again, and deposited the soap nearly in the same place whence he had taken it; thus betraying, both by his first and last actions, a consciousness of having done wrong."

We shall close these anecdotes with a very touching one, illustrative at once of the most tender and faithful love, and of the deepest sorrow. After the Battle of Aughrim, the bodies of the Irish were left where they fell, to the birds of the air and the beasts of the field. Among them was an Irish officer, who was killed and stripped in the battle. But his faithful Dog discovered his remains, and guarded the body day and night; and though he fed with other dogs on the slain around, yet he would not allow them or anything else to touch the body of his master. When all the dead bodies were consumed, the other dogs departed; but this one used to go in the night to the adjacent villages for food, and presently return to the place where his master's bones only were then left. Thus he continued from July, when the battle was fought, till January following, when one of Colonel Foulk's soldiers, who was quartered in the neighbourhood, happening to go near the spot, the Dog, fearing he came to disturb his master's bones, rushed upon the man,

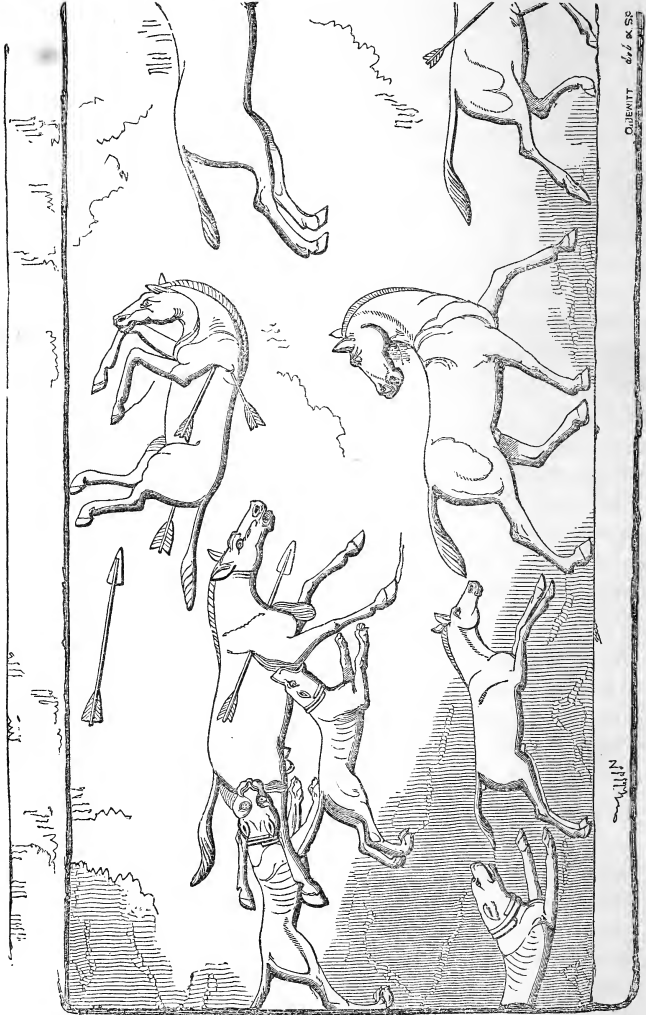
who unslung his musket on the instant, and shot the poor animal dead. He expired faithful as he had lived.

Here we take a respectful leave of our readers. We have sought to lead them, rapidly but not unobservantly, through the wide range of animated being. Our course has been like that of a railway-passenger through a varied and fertile country: it is but a small portion of the expanse that falls under his brief and rapid glances, but then this affords him a fair sample of the whole. We have left untouched multitudes of details, not less interesting in themselves, nor less suggestive than those which we have noticed; but these may suffice to be the spokesmen of the vast band, who with one accord render unceasing praise—not less eloquent because silent to the ear of sense—unto Him who made them all for His own glory. Let us listen to and join in their song—the song of “every creature which is in heaven, and on the earth, and under the earth, and such as are in the sea, and all that are in them:”—

“BLESSING, AND HONOUR, AND GLORY, AND POWER, BE UNTO HIM THAT SITTETH UPON THE THRONE, AND UNTO THE LAMB, FOR EVER AND EVER!”

“THOU ART WORTHY, O LORD, TO RECEIVE GLORY, AND HONOUR, AND POWER; FOR THOU HAST CREATED ALL THINGS, AND FOR THY PLEASURE THEY ARE, AND WERE CREATED!”

P. H. G.



O. JEWETT del & sc

Pursuit of Wild Asses. (Nineveh Marbles.)

THE HORSE AND ASS.

MANY are the useful servants given to man by a provident Creator. There is none more useful, few more noble than the Horse. The Arab and the Cossack in the old world find their chief treasure in the horse, while many of the Indian tribes, both of North and South America, may be said almost to live on horseback. The Gauchos, a half-civilised race, who gallop over the ocean-like Pampas of the Banda Oriental, are among the finest horsemen in the world. Mr. Darwin tells us of an assembled army of these people who elected their general by the following trial:—A troop of unbroken horses were driven into a corral and let out through a gateway, over which was a cross-bar. The soldiers agreed that whoever should drop from the bar on one of these wild horses as it rushed out, and should succeed in riding it without saddle or bridle, and then bring it back to the door of the corral, should be their general. The person who succeeded was accordingly elected. The same naturalist, in 1833, saw immense troops of mares swimming across the Rio Colorado, in order to follow a division of troops into the interior. Mare's flesh is the only food these Gaucho soldiers have when on an expedition; and unloaded horses travel there a hundred miles a-day for many days successively.*

The Indians of North America are also nearly as expert horsemen as their brethren in the South, and employ them much in the pursuit of the herds of buffaloes which scour the prairies of the West. Mr. Darwin refers to the chief Indians of the Pampas keeping one or two picked horses, ready for any urgent occasion; he tells us of a cacique who

* "Researches in Geology and Natural History," pp. 83, 86.

escaped from his pursuers on one of these animals. It was an old white horse with neither saddle nor bridle ; on this he sprung, taking with him his little son. " To avoid the shots, the Indian rode in the peculiar method of his nation, namely, with an arm round the horse's neck, and one leg only on its back. Thus hanging on one side, he was seen patting the horse's head, and talking to him. The pursuers urged every effort in the chase ; the commandant three times changed his horse, but all in vain. The old Indian father and his son escaped and were free. What a fine picture one can form in one's mind,—the naked bronze-like figure of the old man with his little boy, riding like a Mazeppa on the white horse, thus leaving far behind him the host of his pursuers !" Horses are not indigenous to America. They were introduced by the Spaniards ; the myriads in La Plata, for instance, spring from seventy-two horses, which the first colonists landed with in 1535.

But it is in the East that, as Col. Chesney says, the horse is found " in a state bordering on perfection." There he is distinguished by the smallness of his head, with its pointed ears, by the peculiarly clean muscular limbs, by the delicacy and slenderness of his shape, and by the animation of his large eyes, which have much of the intelligence so conspicuous in the dog. " He is frequently allowed to frolic through the camp like a dog, and at other times he is piqueted at the entrance of the tent ; he is exposed to the weather at all times, and, compared with the treatment of his species in Europe, he is scantily fed. A meal after sunset, consisting of barley, in some parts of the country, and camel's milk in others, or a paste of dates and water, which, in Medjid, is mixed with dried clover and other herbs, constitutes his usual sustenance ; but on any extraordinary exertion being required, flesh is frequently given, either raw or boiled."

Although the horse with us is much used in the cultivation of the ground and as a beast of burden, it was not so employed in Scriptural times, nor is it in the East at the present day. The noble description in the 39th chapter of Job shows that the horse was then employed chiefly in war. "Hast thou given the horse strength? hast thou clothed his neck with thunder? The glory of his nostrils is terrible. He paweth in the valley, and rejoiceth in his strength: he goeth on to meet the armed men. He mocketh at fear, and is not affrighted; neither turneth he back from the sword. The quiver rattleth against him, the glittering spear and the shield. He swalloweth the ground with fierceness and rage: neither believeth he that it is the sound of the trumpet. He saith among the trumpets, Ha, ha; and he smelleth the battle afar off, the thunder of the captains, and the shouting." (Job, xxxix. 19-25.) The Jews were commanded not to multiply horses, and woe is pronounced by the mouth of Isaiah on them, who "go down to Egypt for help, and stay on horses, and trust in chariots, because they are many, and in horsemen, because they are very strong; the Egyptians are men, and not God; and their horses flesh, and not spirit." (Isa. xxxi. 1, 3.) At that time the Jews had lapsed into idolatry, and under their kings carried on wars with the surrounding nations, and like them employed chariots and horsemen; for we read that "Solomon had forty thousand stalls of horses for his chariots, and twelve thousand horsemen" (1 Kings, iv. 26); whereas, in the days of Joshua, the Jews were commanded to hough the horses taken in battle from their enemies, and not to keep them (Joshua, xi. 6).

It was for war and for purposes of show that horses are mentioned in the Bible as being kept by the nations of the East, some of whom dedicated their finest horses to the sun, — an idolatrous practice, in which they were followed by the Jews before the time of good king Josiah, who destroyed idolatry in his dominions, as is recorded in the 23d chapter

of 2 Kings: "He took away the horses that the kings of Judah had given to the sun, at the entering in of the house of the Lord, and burned the chariots of the sun with fire," (xxiii. 11.)

On the Assyrian monuments in the Museum, the trappings of the horse are given with such fulness of detail, that a large illustrated work might be published on this subject alone. Indeed, it is much to be wished that some literary saddler would take up the matter and furnish such a monograph. He would find interesting matter, too, in the costume of the charioteers, and the pedestrian attendants with their strong, rough, well-laced boots. The most minute ornament on the metal bindings and other appendages of the head-gear has been faithfully copied by the sculptor. In the accompanying woodcut, one of the most simple, but



at the same time one of the neatest specimens of horse-gear is represented. It is faithfully copied from one of the two horses attached to the car of Assur-bani-pal, and which are being stopped by the driver and his assistants, the king having turned round to address some one.

Habakkuk, who prophesied about the time when many of these marbles were sculptured, refers to the Chaldeans, "that bitter and hasty nation," who were so "terrible and dreadful" when they came "up for violence." "Their horses also are swifter than the leopards, and are more fierce than the evening wolves; and their horsemen shall spread themselves, and their horsemen shall come from far; they shall fly as the eagle that hasteth to eat." (Hab. i. 8.) Mr. Layard remarks, in his first work, that "the horses of the Assyrians were well formed, and apparently of noble blood." "No one can look at the horses of the early Assyrian sculptures without being convinced that they were drawn from the finest models. The head is small and well shaped, the nostrils large and high, the neck arched, the body long, and the legs slender and sinewy."* According to this author, the Egyptians would appear to have been chiefly indebted to the countries watered by the Tigris and Euphrates for their horses, as we know that these same plains furnished horses to the Persians, both for the private use of the king and for his troops; according to Herodotus, 16,800 of these animals were maintained by the Babylonians for the Persian monarch.

On his journey to Palmyra, Mr. Porter's † little caravan was surprised by a party of the Bedowin. One of these separated from his companions to take a view of the caravan.

* "Nineveh and its Remains," vol. ii. 360.

† "Five Years in Damascus." By Rev. J. L. Porter, A.M., vol. i. pp. 175, 176. 1855.

“At first he appeared like a bird skimming over the surface of the ground; and the rapid pace at which he swept down the gentle slope would have led one to suppose that it must have been some winged animal approaching. The outline of the steed soon became visible, and then the form of the rider crouched close to his back; then the tufted spear projecting far in front; and ere we had surmounted the rising ground, the tattered Arab reined up his noble steed within fifty yards of us. We had viewed this scene with lively interest. Never before had I seen the Arab horse on his native desert; and however exciting were the present circumstances, and however calculated to awaken suspicions of coming danger, perhaps of plunder, yet admiration was the only feeling we entertained for the moment. And when the stranger drew up, and his mare stood patient and gentle, without symptom of weariness or quickness of breathing, but with expanded nostril and proud eye, I could see at once why the Arab loves his horse. The horse is everything to him. Money he cannot use to advantage, and his simple wants are easily supplied. His few sheep or camels gather their food from a parched soil, which no other lord claims. A genial clime makes rich clothing—such a costly toy to the denizens of the city and to civilised nations—of little use to him. A tattered garment will serve him for years, and the simple furniture of his tent is generally hereditary. What, therefore, would be money to him? But his noble horse will carry him swiftly over the parched desert, to the side of the devoted caravan or solitary wanderer; and when danger threatens, he will as swiftly convey him beyond its reach.”

The Arab cannot show more attachment to the companion of his wanderings over the deserts of the East, than the poor Indian of North America sometimes manifests to his rougher steed amid the grass and flower-filled prairies of the West. Lieutenant-Colonel Emery* speaks of a Maricopa Indian, without saddle or stirrup, coming into the camp at full speed, balancing himself to the right and left with such ease and grace as to appear part of his horse. The horse was alarmed at the novel apparition of the party forming the encampment. A young officer offered to buy the horse. The Indian “caressed the horse’s neck, at the

* “Military Reconnoissance between Missouri and California,” p. 84.

same time shutting his eyes, meaning thereby that no offer could tempt him to part with his charger." How unlike the horse-selling propensities of similar classes in Europe, who are proverbial for the readiness with which they part with this kind of property! The mares of the Arabs not unfrequently belong to more than one family, who severally keep the pedigrees of their favourite horses, so that it is sometimes rather a difficult matter, according to Col. Chesney, to purchase one. The Arab horses deteriorate when removed from their deserts, and lose many of the peculiarities by which they are distinguished: the climate and difference of treatment may readily account for this.

In some of the northern parts of Asia, mare's milk is used in a prepared form, called "koumis,"—a form in which it would come under the drinks forbidden to members of temperance societies. This "koumis," when taken in quantity, has an intoxicating effect on the drinker of it. Sauer* describes the manner in which the nation of the Yakuti make this. The mares are milked twice a-day, and the milk is collected into large leathern buckets called "symirs;" these are formed like a bottle, wide at bottom and narrow at top; into each of these a small piece of the stomach of a calf or colt is thrown, and some water is then poured into each. A stick, wide at the end, is used to stir this mixture, and it is kept in constant agitation by this means until it ferments. The milk thus acquires an acid taste, which is very agreeable to the race who use koumis; although it cannot be admitted into the number of the liquids which "cheer but not inebriate." Every one collects as much koumis as he can, and "the cellars" of some of the chiefs contain more than five hundred ankers of it.

The Ass belongs to the same family as the horse, and

* "Expedition to the Northern Parts of Russia," p. 116.

there are two species of the genus mentioned in the Scripture. The common ass of the East is a much finer animal than the variety met with among ourselves, so celebrated for his patience, and stubbornness, and the hard treatment which he usually receives. In the Bible, we read of the domestic ass being employed in husbandry; the Jews were forbidden to plough with an ox and an ass together (Deut. xxxiii. 20). With sheep, and oxen, and camels, asses formed part of the riches of the Patriarchs (Gen. xii. 16). Job is recorded to have had a thousand she-asses (xlii. 12).

Abraham rode on an ass when he went with his son Isaac to Mount Moriah; and it was not till the introduction of the horse into Palestine that the rich left the use of the ass to the poorer classes. He who was despised and rejected of men, was to come "unto the daughter of Jerusalem, lowly and riding upon an ass, and upon a colt the foal of an ass," as prophesied by Zechariah. This was literally fulfilled, as recorded by the Evangelists.

But there is another ass mentioned in the Bible,—the wild ass (*Asinus hemionus*), who "scorneth the multitude of the city, neither regardeth he the crying of the driver," whose house is the wilderness and the barren land his dwellings (Job, xxxix. 5–8). This fine animal is still met with on the plains of Assyria, where it is conspicuous for its freedom from all restraint, and being "loosed" from all "bands." In fleetness, according to Layard, it is equal to the gazelle, and there are but few horses that are able to overtake it.

On some slabs which were found by Mr. Loftus in the Palace of Assur-bani-pal at Nineveh, there is a most life-like representation of the pursuit of a herd of wild asses on one of the Assyrian hunting-grounds. About twenty of these children of the desert are being pursued and harassed by mounted horsemen, who follow with their large and

powerful dogs. The colts are shown in these admirable bas-reliefs trotting away by the sides of their mothers, who seem to slacken their pace to enable the young things to keep up with them. Some are pierced with arrows from the bows of the horsemen, while others are pinned to the ground by the dogs, or having their speed diminished by the savage bite of a canine pursuer. One wild ass seems to have been struck in the heart as it rears in the air, much as animals do when wounded in this fatal spot. On another part two men are pulling at a lasso, with which they have caught their prey by the neck. On this frieze, the wild ass is represented in every attitude likely to be assumed in pursuit; and it is evident that the artist must have derived his design from studies of the wild animal on the field, so much of life and vigour being expressed on the sculptured slabs. Our engraving (p. 378) represents a small portion of this slab.

The Arabs of Mesopotamia frequently capture this beautiful animal when young, and generally kill it at once for food. It is almost impossible to take it when full grown. When young, Layard* says they are very playful and docile. One he had at Mosul followed him like a dog.

The late Mr. Richardson† informs us, that at Mourzuk, the people, in order to avert the evil eye from their gardens, put up the head of an ass, or some portion of the bones of that animal. The same superstition prevails over all the oases that stud the north of Africa from Egypt to the Atlantic; but like other superstitions, the people are unwilling to explain what especial virtue exists in an ass's skull. From some of these people, however, we may learn, as did Mungo Park, how to manage a refractory donkey. During his first journey, one of these creatures

* "Nineveh and Babylon," p. 270.

† "Mission to Central Africa in 1850, 1851."

getting obstinate, his negroes cut a forked stick, and putting the forked part into the ass's mouth, like the bit of a bridle, tied the two smaller parts together above his head, leaving the lower part of the stick of sufficient length to strike against the ground, should Master Donkey venture to attempt to put his head down. After this the ass walked along quietly and gravely enough, taking care, after some practice, to hold his head sufficiently high to prevent the stones or roots of trees from striking against the end of the stick, which experience had taught him would give a severe shock to his teeth. This contrivance, Park was assured by his fellow-travellers, always proved effectual.* A. W.

DIVINE THOUGHTS *IN* THE FACTS OF CREATION.

THE STELLAR UNIVERSE.

FROM our own planet and our planetary system we ascend to—

III. THE VAST CONCAVE OF STARS.

The magnitudes, the distances, the velocities connected with the solar system, are mensurable, though incomprehensible. We cannot here grasp in our conception the results of calculation. But the calculation can be made, and the results can be relied upon with perfect certainty. Between the solar system and the stupendous sphere of stars, in which it is the merest atom, there is this essential difference, that the latter is absolutely immeasurable by us. Of the number of the fixed stars, of the magnitude of a single one of them,

* "Travels in Africa," p. 49.

we know literally nothing, and even of the distance of the nearest of them, all that is known is this, that it must be more than twenty millions of millions of miles, because, if it were only this much, this could be ascertained by the methods of geometrical astronomy. But how much more than this it is distant cannot be ascertained. Of one thing we are perfectly sure, that since beyond this distance the stars are seen by us, their magnitude must be enormous, and they must be surrounded by an inconceivable intensity of light.

It is more than conjecture which represents these mighty orbs as not single stars, but systems, each a sun, around which may revolve a multitude of planets, attended, perhaps, by their satellites. It is a conclusion founded on analogy so strong that it may almost lay claim to the certainty of induction. No one doubts that the solar system, at a distance sufficiently great, would appear but a single star, and that all its light, direct and reflected, would be reduced to a point. These stars in boundless space, the nearest more than twenty millions of millions of miles distant from us, and myriads of them immensely more distant still, must *they* not be systems thus concentrated and reduced? But imagination is confounded and stupified by what reason so distinctly presents.

The effect is yet more insupportably oppressive when, from those multitudes of stars that are seen by the naked eye, and the multitudes more that are revealed by a telescope of ordinary power, all of which are not simple stars, but systems of stars, each with a central sun and revolving planets, we pass to what are called the nebulæ in the sky. Every one is familiar with the milky arch which is often seen to span the circuit of the heavens. It appears to the eye; and even to the ordinary power of the telescope, as if it were thickly sprinkled with what has been significantly

called starry dust. But, by higher telescopic power, it is discovered that every atom of that dust is indeed a star, or rather a system of stars, so distant that its light can be discerned only when blended with that of other stars and systems; the whole together yielding only a thin, fleecy, dissippable whiteness. The idea of number that is here suggested, and of distance, and of magnitude, the idea of the myriads on myriads of spheres that people immensity, overwhelms all thought, all imagination.

But the nebulae are not confined to the milky way, they are scattered in great numbers over all parts of the heavens. They appear as dim, cloudy spots, patches of the thinnest vapour. But each particle of that vapour is discovered to be a star, or rather a system of stars. These vapoury patches disclose to the powerful telescope their countless orbs. The mind is lost in the vain effort to calculate a sum, which only multiplies the faster as it is attempted to be reduced. Silently, majestically, these mighty spheres and systems, in myriads that defy all computation, seem to repose in the void immense. We are sure that a perfect harmony reigns among them, and are justified in believing that the same laws which operate with resistless force, and with never-failing efficiency here, exert their mighty sway there also.

Of the varying appearances that have been noticed in some stars at different times, of the disappearance of some for a time and their reappearance, of the double stars, the binary systems, many hundreds of which have been observed, and which are seen to revolve around one another in regular periods, we shall not speak. But it must not be omitted that our solar system, and the countless myriads of systems in space, each within itself performing vast revolutions, are conceived to form all together one stupendous whole. The stars in the entire concave which seems to encircle this

earth, numberless, perhaps, as the atoms of sand on the ocean-shores, form a glorious unity. Each has its own economy and its own complicated movements, with which the others interfere not. But the whole is conceived to be revolving around some common but unknown centre. Many circumstances have been marked which seem to sanction the idea of such a universal revolution. And even within a comparatively short period, it has seemed more and more probable that astronomers were approaching the undoubted establishment of the theory.

With what sentiments of awe is not the little we certainly know respecting the starry sphere fitted to inspire our minds! It is within the solar system only, indeed, that the inductions and conclusions of science are such as cannot be gainsaid. There we read, by tokens not to be disputed, expressions of thought more profound and more expressive than can be set forth in letterpress. Beyond the solar system the reasoning is only analogical. But the analogies are such as fall scarcely short of the authority of induction. It is perfectly certain that the same physical laws which govern the more limited also govern the wider sphere. And if no more, at least the overwhelming vastness of the sidereal system we know beyond all doubt. And vast as that mighty sphere of stars and systems is, everything we observe discountenances the notion of uncertainty or confusion as attaching to it. It is order we behold—stupendous order. It is a harmony we look upon—a magnificent harmony. Order is the effect of law, and law is the creation of mind. Harmony is the offspring of intelligence. It is the nice adjustment and balancing of relations—the delicate equilibrium of forces, originated by a profound, a far-seeing, and a comprehensive wisdom. Astronomical Science proclaims everywhere an underlying thought, inconceivably grander than the outlying phenomena.

QUÆRENS.

CANDLES AND LAMPS.

(Concluded.)

Tallow Candles are cylindrical or slightly conical rods, formed of solid fat, enclosing a bundle of parallel or twisted fibres of cotton, called the *wick*, through which the melted fat is drawn up to the region of combustion, as already explained.

The Wicks employed for the best candles are composed of cotton rovings, imported from Turkey. In common candles, the wick is formed of parallel fibres, and the glycerine, which is present in the fat, being much less combustible than the fatty acids, always produces a carbonaceous snuff at the end of the wick, which can only be removed either with snuffers or by causing the wick to curl towards the edge of the flame, where it is wholly consumed in contact with the current of air. By plaiting the wick in the braiding-machine, it acquires this property of curling. In the finer quality of candles, such as stearic, spermaceti, and wax, the wick is also impregnated with some salt, such as borax, which melts at the temperature of the edge of the flame, combines with the ash of the wick, and finally drops off in the form of a small bead. Tallow, however, from its greater fusibility, is very apt to *gutter* when the wick is thus ready to curl to the one side, unless prevented by being confined in a cap, as in Palmer's candle-lamps, where the candle is inclosed in a vertical metallic cylinder with a cap, whose orifice is smaller than the candle, which is forced upward against the cap by a spiral spring.

In Palmer's tallow-candles, which require no snuffing, one thread of the wick is first impregnated with subnitrate

of bismuth ground up with oil, the whole is then bound round in the manner called *gimping*. One, two, or more of these wicks, are wound round a thin rod in a spiral manner, and placed in the centre of the mould, which is then filled with tallow. When the tallow cools, the rod is withdrawn. On burning these candles, the wicks uncurl, and form so many separate flames, and the ends coming in contact with the air at the edge of the flame, are consumed. The same effect is produced by drying the wick to expel the moisture, and dipping them in oil or candle-stuff at a temperature of about 300° or 350° Fahrenheit, then winding them round a cylindrical rod in a spiral manner. They are lastly straightened before the fat imbibed has had time to cool.

The wicks for dip candles are often cut by machinery in a very expeditious manner. Balls of cotton, previously made into loose roving or cord, each consisting of a dozen or more threads, but differing in thickness according to the size of the candles, are put into a box or drawer. The ends are then attached to a rod or broach, and equal lengths of cotton are cut off by drawing a knife along a whole range of them at once, a slight twist being given them by the action of the machine.

Morfit describes another machine much used in America, which is said to cut, spread, and twist as much wick in one hour as serves to make one thousand pounds of candles.

Tallow candles of the cheapest kind are made by repeatedly dipping the wick in the melted fat, and are then called *Dips*, to distinguish them from those made with *moulds*. These latter are cast in cylindrical pewter vessels of the exact shape of the candles, slightly tapering towards the wick end, and carefully polished inside. Glass and earthenware have also been employed as the material for these

moulds. The wick is carefully kept in the middle of the mould by acting as a stopper at the tapering end of the mould. This forms the lower end in making the candle, which is reversed when placed in the candlestick. The other end of the wick is drawn tight through an eye in a piece of metal soldered to a point in the margin of the mould.

The tallow must completely fill the mould, which is kept in a perpendicular position, and the candles ought to remain entire, without cracks on cooling, and should be easily removed from the mould. These conditions are attained in proportion as the particles at the sides cool more quickly than those in the interior, but more especially as the tallow is cast at a proper consistence, which the workmen recognise by the appearance of a scum on the surface. Various contrivances have been suggested to facilitate the moulding of candles, and the machine invented by Morgan is that most generally adopted in this country.

In the process of *dipping*, two vessels are used, one for melting a supply, and the other containing the tallow in the proper temperature. The wicks, according as six or eight go to the pound, are hung side by side on a wooden rod or *broach*, sixteen or eighteen together. The wicks are first saturated with hot tallow, and then rounded in the palm of the hand or on a flat board. The dipping is done by a quick, steady motion of the hand, and, after each immersion, the broach is removed to the frames of laths, called *the post*, where they harden. This operation is repeated until the candle acquires a proper thickness.

This operation is performed by a machine, each broach being supplied with a number of wicks, and thirty of these broaches are ranged side by side, and then constitute what is termed a *frame*. From thirty to forty of these frames

may be suspended on the same machine, which thus supports, at one time, many thousands of candles.

A vessel of melted tallow is placed in front of each machine, and the frames are brought, one after another, immediately above it and dipped. By means of a lever, moved by a foot, a wiping-board is lowered after each dipping, which removes the excess of tallow from the lower end of the candles. A kind of steel-yard, to which each frame is in turn attached, indicates the successive increase of weight, and enables the workman to ascertain when the candles have been dipped a sufficient number of times, after which they are set aside to harden and dry.

Although the process of dipping is much more laborious than moulding, it admits of inferior tallow being employed for the inner parts, while the best is used for the outer coating or layer. Candles improve by keeping, and become harder, as well as whiter, by exposure to the bleaching action of the air.

The manufacture we have now to notice has arisen from the researches of Chevreul on the Fatty Bodies, which led to the separation of the chief constituents of tallow by a very simple process. Tallow, in a perfectly fluid state, is allowed to cool very slowly, with constant agitation, to about 100° Fahrenheit, at which point the *stearine* only has become solid, in the form of numerous small crystals, which swim in the fluid portion. This pasty mass, subjected to the ordinary hydraulic pressure, loses all the fluid portion of the tallow, the *oleine*, which is imbibed by the woollen cloths, and leaves a solid cake of *stearine*, which is obtained of greater purity by repeating the operation.

Now these two substances, *stearine* and *oleine*, belong to a class of bodies called Salts, just like Glauber or Epsom salts, green or blue copperas. Both contain the same base,

oxide of glyceryle ($C_6 H_7 O_5$), combined, in the one case, with a solid acid, *stearic*, and in the other with a liquid acid, *oleic*, which acids have many of the properties of the fatty bodies from which they are separated. The stearic acid, however, has been proved by Heintz to contain, in some cases, a large proportion of palmitic acid, already named as the characteristic acid of palm-oil. For example, mutton suet is composed of one part stearine and ten parts palmitine.

The great improvement in the production of candles dates from 1831, the imperfect combustion of the wicks being remedied by soaking them in borate, phosphate, or sulphate of ammonia, &c. ; and the large grain of the crystals being overcome by using small quantities of arsenic, which prevented the crystallisation, but which was subsequently superseded by a little wax.

Stearic Acid.—The method of obtaining this substance will be readily understood by referring to our previous remarks. The tallow is decomposed by lime, which, being a stronger base, separates the oxide of glyceryle from its acids, which being set at liberty, dissolves in water; the result being, a mixed compound of lime with stearic and oleic acids, is decomposed by sulphuric acid into an insoluble sulphate of lime, and a solution of stearic in oleic acid, which are separated from each other by crystallisation and pressure. The fatty acids are washed first with dilute sulphuric acid, and then with pure water. The pressure is also assisted by heat, so as to remove the last traces of oleic acid, and the cakes of the solid stearic acid are bleached by exposure to the air.

While this process was gradually gaining ground for the introduction of the stearic-acid candles, a new art has been acquiring an enormous development, founded on the same

basis, but accomplishing its end by different means, and we will now trace its history.

We have already alluded to the action of the strong mineral acids on the fatty bodies, and this new art relates exclusively to the saponification of fat by means of sulphuric acid. To Chevreul belongs the honour in the first instance, but Fremy, perhaps, most clearly exhibited the relations of fats to sulphuric acid in 1836. He proved, that while lime and the alkalies only combine with the fatty acids, setting the glycerine free, the sulphuric acid united to both, forming conjugate or double acids, thus sulpho-stearic, &c., acids on the one hand, and sulpho-glyceric acid on the other. The first are not very stable, water decomposing them into slightly modified fatty acids insoluble in water, while the sulphuric acid with the latter (sulpho-glyceric acid) dissolves in the water.

Gwynne, in 1840, suggested an application of these facts, and proposed distilling the fatty acids *in vacuo*, but his process was not economically successful, and the same fate attended Clark's plan of separating them without having recourse to distillation.

The next step was the process of Dubrunfaut, who proposed to heat common oils to a high temperature, and pass steam through them; but the production of acroleine was so great that no workmen could be found to endure the pungent and irritating action of the substance on the eyes and throat.

In 1842, Jones and Wilson combined these plans of *sulphuric*-saponification and *steam*-distillation.

Further improvements followed in heating the fat to 350° Fahrenheit, and *the steam itself*, after leaving the boiler, instead of depending upon the temperature of the fat for this purpose.

These processes enable Mr. Wilson to work up fats the

most foetid and impure, the waste of the glue-maker and the oily residues of the woollen factories, into the higher class of candles, white, inodorous, and dry to the touch; and certainly they present an attractive combination of chemical and mechanical science.

We will now briefly describe these two different modes of working up the fatty bodies for our modern stearic acid candle.

1. *Description of the Lime Process.*—Several tons of tallow, with a quantity of water, are thrown into a large wooden vat, containing a coil of steam-pipes, pierced with small holes. The steam being turned on, soon melts the tallow, and raises the water to a brisk ebullition. A quantity of lime, in the form of a fine cream, is added, and the ebullition continued until the saponification is perfect. As already explained, the lime combines with the fatty acids, forming what is termed *Rock-Soap*, while the oxide of glyceryle unites with water, forming a hydrate, which we have often named under the term glycerine.

The *Rock-Soap* is crushed to small pieces between fluted rollers, and is then placed in vats lined with lead, supplied with a perforated copper steam coil. When the boiling-point is reached, sulphuric acid is added, and the oily acids float on the surface under the cognomen of *yellow matter*. This yellow matter is run off by cocks into large spouted vessels, called *Jacks*, and poured from these into flat tin-moulds. The residual sulphate of lime is washed with boiling acidulated water to remove all adhering fat, and then sold as manure.

The cakes of yellow matter are interleaved with coconut mats, and subjected, between iron plates, to a pressure in the cold of six hundred tons in a vertical hydraulic press, by which a large portion of the oleic acid is removed.

This *cold-pressed* acid is *refined* by melting with steam,

and treating again with a little dilute sulphuric acid to remove any oxides of iron, &c., and finally allowed to cool and crystallise.

These refined cakes, when cold, are put separately into a linen-bag, interleaved with cocoa-nut matting and iron-plates, previously heated by steam, placed in the trough of a horizontal hydraulic press, likewise heated by steam, and then subjected to great pressure for some time. The remainder of the oleic acid is removed by this operation, and the cakes are refined a second time, when the product is considered pure.

The subsequent moulding of the candle is attended with the precautions we have already named, and they are exposed to the action of the air and moisture to allow the surfaces to undergo a process of bleaching and improve their appearance.

They are then washed in a weak solution of carbonate of soda to remove all dust and other impurities, placed on a linen sheet, and subjected to gentle pressure under a cushion of linen, which dries up the moisture and communicates a degree of polish.

The last operations are *cutting* and *polishing*, which are performed by a machine, in which a revolving saw cuts the ends smooth, and a series of cylinders and rollers working together with an endless woollen cloth-belt, completes the final polish.

The oleic acid is manufactured into an inferior soap, and employed in the preparation of woollen goods.

2. *Sulphuric Acid and Distillation Process.*—A large quantity of fat, or palm-oil, is melted by means of steam and allowed to settle, when it is pumped into a strong sheet-copper boiler, in which it is heated to a temperature of 350° Fahrenheit, and submitted to the action of concentrated sulphuric acid. The operation lasts some time, and,

after the violet hue has disappeared, the contents of the boiler are run off into a cistern two-thirds filled with water, while a current of steam is admitted to assist the washing process.

The fat is then transferred to metal-stills, where it is heated to 560° Fahrenheit by an open fire; and low-pressure steam, previously heated by passing through a system of iron-pipes in a furnace, is forced up through the mass. The current of steam carries with it the fatty acids, and thus facilitates the operation. The mixed vapours pass through a series of pipes retained at a temperature of 212° Fahrenheit, where only the fats separate, while the steam is carried to a second range of pipes, exposed to a current of cold water for condensation.

The residue, after the distillation has been carried as far as practicable in this still, is then removed to another still formed of iron pipes, set in a furnace, and there submitted to a much higher temperature and a jet of steam still more strongly heated. The residue is a sort of pitch, in which form it is sold and applied to the ordinary purposes for which this substance is used.

The highest-priced candles are still made in the ordinary moulds, but a machine is in use at the colossal works of Messrs. Price and Co., at Belmont, for moulding ordinary stearic acid, cocoa-stearic, and composition candles, which, in discharging one set of candles from the moulds, re-wicks the moulds for the next process of filling. The small conical tops of the moulds employed with this machine are moveable, and can be pushed down into the cylindrical part of the mould, but, on returning to the top, are prevented by a rim from passing beyond the cylinder. The moulds are arranged side by side, eighteen in number, on a frame, and for each mould there is a reel, capable of containing sixty yards of wick, inclosed in a box attached to a frame. To

have some idea of the process, we must suppose a frame of moulds, full of candles, with the wicks protruding at the top, and still in connexion with the reels, brought into a horizontal position exactly in front of a set of plungers which the workman draws forward by means of a lever. Each plunger is thus pressed against the conical cap of a mould, and, in forcing it into the cylinder, ejects the candle, and carries a portion of wick into the mould to be coated by the next charge of melted fat. The candles are projected, and a piece of wood, covered with flannel, moving on a hinge, and cut out to fit the candles, is pressed upon them for the purpose of holding them firmly; while a circular-knife arriving at the instant, which cuts off the wicks of the finished candles, leaving a portion intended for the following charge protruding from the moulds. The prominent portions of the wicks are now firmly clasped by a number of forcipes attached to a rod; the plungers are then drawn back, taking with them the conical caps of the moulds and tightening the wicks; the whole frame, wick-box and all, is then inverted, the conical end downwards, on to a pair of rails at the side, where a boy pushes it forward toward a hot closet, where it acquires the proper temperature before being filled. The fat is contained in a cistern, above the rails, in which it is kept at the melting point by steam-pipes; and as each frame is brought under it after leaving the hot closet, the moulds are filled by as many cocks or outlets from the cistern. The frames travel to the end of the rails, which are of considerable extent, and, when the fat has solidified, the forcipes and superfluous material are removed, and the frames transferred by a travelling truck to a parallel set of rails on the other side, to be brought again opposite the plungers, when the candles are expelled. Each machine has, on an average, 200 moulds, each mould contains 18 bobbins, and each bobbin,

when first cottoned, 60 yards of plaited wick: so that, when the seven machines in Price's factory are at work at once, there would be a length of 800 miles of candles on hand!

Six descriptions of stearic candles are made at the Vauxhall Works, differing in the material whence the mixture of the fatty acids is derived. *Belmont Sperm* is made from *hot-pressed palm acid*. *Belmont Wax* is of the same material, but *tinted* with *gamboge* to give it the appearance of wax. The best *Composite* candles are a mixture of *Belmont Sperm* with *cocoa-nut stearine*.

The No. 2 composition of this firm is employed in preparing the *Albert Night-Lights*, which are short thick cylinders of fat, with a very thin wick, so proportioned to the diameter of the cylinder that it shall burn 6, 8, 9, or 10 hours. These are made in a metal frame, perforated with a number of cylindrical holes, to each of which there is a moveable or false bottom, with a thin wire projecting upwards in the centre. The cylindrical holes being filled with the molten fat, and this having cooled, the bottoms are forced up by a lever, and the cylinders of fat all ejected at the same moment, each pierced with a central hole for the wick. The wicks, previously impregnated with wax, rendering them stiff, and having a small piece of tin as a support for the bottom, are quickly and dexterously inserted by children, the bottoms made fast by suddenly pressing the wick'd cylinders on a warmed porcelain cap, which melts the fat in contact with the piece of tin. These lights are burned in small glass cylinders, into which they fit. Child's Night-Lights are made by pouring the melted material into cylindrical card-board boxes, and Price's Night-Lights are similar, but made from a cheaper material.

Spermaceti Candles are moulded in the same way as those composed of stearine or stearic acid.

Wax Candles.—Wax is not adapted for moulding, in consequence of the contraction which it undergoes on cooling, and the tenacity with which it adheres to the sides of the mould. The mode of preparing these candles is analogous to the *dipping* process; but instead of dipping the wicks in the melted wax, they are *basted* with it.

The wicks having been previously warmed are attached to a hoop of wood or metal, and suspended over the melting vessel. While the wick is kept constantly turned round its axis by the fingers, hot melted wax is poured slowly over it from a ladle, beginning about $1\frac{1}{2}$ inches below the loop; by turning the hoop the next wick is put through the same operation, and so on until they have all received their first *basting*. The position of the wicks is reversed before more wax is poured over them, and the free portion of the wick is covered with a cap or tube of tin. Wax is again poured upon the wicks in succession, turning them round as before. When the candles have attained a proper thickness at the bottom, which is of course the thinnest portion, the *basting* ceases. In order to make the cylinders uniform, they are taken hot from the hoop, and kept at a proper temperature between hot flannel, and while still warm, they are moulded upon a wet table with a rolling board. They are *basted* a third time, and again rolled and cut to a certain length. On breaking a wax candle, the annular layers, like the year-rings in wood, can be easily counted, and their number indicates the number of *bastings*.

The large church candles are made by placing a wick upon a slab of wax, bending this together, and then rolling the whole mass.

The long, thin, coiled wax tapers are drawn in a peculiar manner. The wick, which must be very uniform, and wound on drums, passes from the latter into the wax pan, at the bottom of which a guiding-roller is fixed, and from

thence through a draw-plate to a second drum. The draw-plate, similar to those for wire-drawing, consists of a metallic disc, with holes corresponding in size to the diameter of the taper: these are round therefore, when the taper is to be cylindrical, and in the shape of a star, then the taper is to be grooved.

In China, the candles which every one uses at night inside of their grotesque lanterns, and of which there is such an enormous consumption in the worship of their idols, are made by dipping the wick in their vegetable tallow and coating them with the white insect-wax. They are coloured red by a small quantity of alkanet root, and green by means of verdigris. In this country wax candles are coloured,—*Blue*, with artificial ultramarine; *green*, with verdigris alone, or mixed with emerald green; *yellow*, chrome yellow; *red*, vermilion; *pink*, madder lake.

We have already alluded to the paraffine candle, and we add the following table, which exhibits, at a glance, the comparative value of different kinds of candles for purposes of illumination:—

Kind of Candles.	Grains of Material consumed in 4½ hours.	Light from an equal Amount of Material.	Illuminating Value or Light obtained for a certain Fixed Amount of Expenditure.	Relative Price of Material.
Paraffine 4 to the lb.	525	1·000	1·000	30
Spermace ^{ti} .. 6 ,,	540	0·826	0·620	40
Wax.. .. 4 ,,	552	0·450	0·519	26
Artificial wax .. 5 ,,	642	0·760	1·086	21
Ordinary stearic acid 4 ,,	822	0·543	1·018	16
Tallow 6 ,,	1020	0·450	1·350	10

OURSELVES.

RESPIRATION.

THE mechanism of the Chest and Lungs well deserves attention. In shape the *Thorax* or *Chest* is somewhat like a beehive: more strictly, it is a hollow Cone, truncated above, and flattened behind. The masonry of its walls is strong and compact. They are constructed of the twelve vertebræ of the back, fourteen true and ten false Ribs,* and the breast-bone; in all thirty-seven bones, firmly fastened together, yet all, more or less, moveable. Auxiliary to them are the Collar-bones and Shoulder-blades; whose more immediate use, however, is to form the shoulder-joints.

The Ribs are joined *obliquely*, not horizontally, to the back-bone. At first sight this might appear to be unimportant; but we shall see that it greatly facilitates the act of breathing.

A large expanded muscle, called the *Diaphragm*, attached to the edges of the lower ribs, extends across the bottom of the chest, and separates it from the cavity of the Abdomen.

Between the edges of the Ribs are two strata of muscles, called the *Intercostal Muscles*, the fibres of which differ in their direction, but not their use. Some large portions of other muscles assist in giving strength and solidity to the walls of the chest, over which is spread the common integument.

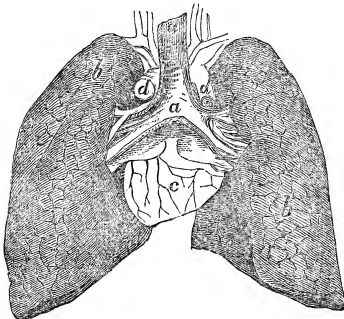
The interior of the chest is lined by a strong, smooth, transparent membrane termed the *Pleura*. There are, how-

* This distinction is almost only anatomical or descriptive. The true ribs are bony throughout their whole length: the false ribs are shorter than the true, they differ in length, and are united to the breast-bone by cartilage.

ever, really two Pleuræ, which, like two well-moulded sacs, placed side by side, fill the greater part of the cavity and line the whole inner surface, except two spaces, one immediately under the breast-bone, the other in front of the backbone. These are named by Anatomists the *Anterior* and *Posterior Mediastinum*. Through the latter of these the large blood-vessels, going to and from the heart, the trunk of the Absorbent Vessels, and the Nerves which supply the lower parts of the body, &c., pass up and down.

The upper part of the Cone is occupied by the windpipe, the œsophagus, the arteries, and veins, which convey the blood to and from the head, and several muscles.

At the upper part of the interior of the chest both the Pleuræ are folded down and form the outer covering of the Lungs. The *Lungs* are two large, spongy, cellular, expansible organs, which, with the heart, nearly fill the whole cavity of the chest. Though apparently separate, and commonly spoken of as the right and left Lung, they are not quite distinct from each other; for they receive the air through a common tube, and the blood through a common vessel.* Their form corresponds almost exactly to the inner surface of the chest. Their outer surface, which is free and disengaged, in its whole extent, is covered by a reflexion of



* A tolerably accurate idea of the general figure of the lungs, and their relation to the heart, &c., may be formed from the annexed sketch: *a a* is the trachea or air-tube, dividing into its respective bronchi; *b b* the lungs; *c* the heart; *d d* the arch of the aorta.

the Pleura, as before mentioned. It is smooth, nicely polished, and kept constantly moist with a thin limpid fluid. Each lung is divided, by deep fissures, into lobes; the right into three, the left into two lobes.

After respiration has taken place, the Lungs are proportionately lighter than any other organ in the body. This arises from their *cellular structure*. The shape and size of the cells vary a good deal. For the most part they are polyhedral or many-sided. An ineffective attempt to number them has assigned 1744,000,000 to each lung. Their surface, if extended, would certainly equal, at the very lowest computation, 150 square feet. During a full inspiration, the capacity of the Lungs for air averages, in an adult, at about 120 cubic inches. This, however, necessarily varies with the different sizes of different persons. Their weight differs as much; ranging from 18 to 53 ounces, and averaging at 35.

Over the air-cells are spread the innumerable branches, into which the pulmonary artery and the four pulmonary veins become subdivided. By repeated divisions they form at last an exceedingly delicate network, so delicate, that the blood in the blood-vessels is separated from the air in the air-cells by a wall only the 1000th part of an inch thick.

In the air-cells the little-tubules terminate, which convey the air into the lungs. They are the minute and ultimate ramifications of the two *Bronchi*, or branches, into which the Trachea, or windpipe, divides, just opposite the upper part of the breast-bone; one branch passing to the right, the other to the left Lung.

The *Trachea*, or air-tube, is composed of from sixteen to twenty cartilaginous rings, piled horizontally one upon another. They are not, however, complete circles in the human species; being deficient and only membranous at their hinder part, where it is in contact with the œsophagus

The rings are separated from each other, yet united together by membrane, and thus form a continuous channel, lined within by a very sensitive mucous membrane, and covered without by a strong connecting fibrous membrane.

By the alternate expansion and contraction of the Chest and Lungs *Breathing* is performed. By coincident acts, and just as if by common consent, the Ribs are raised from the oblique into an horizontal position, and their lower margin is turned outwards; the breast-bone is elevated and protruded forwards; and the Diaphragm descends and becomes flattened. This simultaneous play of parts enlarges the capacity of the chest. Immediately the outer air streams in and the lungs are distended. After a slight respite the Ribs sink again, the Breast-bone subsides, and the Diaphragm relaxes; the Chest becomes contracted, and the principal part of the air is expelled. These alternate movements occur, in a person who is at rest, about fifteen times in a minute—about once to every five pulsations of the heart. By them the lungs are continually receiving new supplies of air, and voiding it in perpetual alternation.

Few persons know the use of breathing, and yet three most important purposes in the human economy are fulfilled by it; for the *blood becomes aërated and purified*, the *temperature of the body is kept up*, and, secondarily, the *voice is generated*.

In common with all other organised bodies, whether vegetable or animal, we need the constant influence of atmospheric air. Life can neither be developed nor maintained without its agency. It seems to be more necessary than our daily food; at least, we can live much longer without food than without it. No seed will germinate, no egg can give birth to the smallest insect; from the lowest to the highest, sooner or later, every individual in every form of life perishes, if deprived of air. Upon the sap in the leaves

of plants, through the skins and air-tubes of insects, in the gills, and in the lungs, it exerts an energising and purifying influence, either by introducing oxygen, or eliminating carbon, or by both.

It would be difficult for the reader to understand how we are *kept warm* by breathing, unless he was previously made acquainted with two facts, well known to chemists. The first is, that the matter of Heat, or Caloric, can and does exist in many substances in a *latent or quiescent state*; by which, however, their temperature is not raised above the temperature of surrounding objects; and, also, that by a change in their condition, either mechanical or chemical, it becomes evolved and obvious. The other is, that different substances have different capacities for caloric; and so has the same substance (to speak a little less accurately, perhaps,) in different conditions.

These two particulars, among many others connected with the subject of heat, were first discovered by Dr. Black, about the middle of the last century. Twenty years later they were ingeniously employed by Dr. Crawford to explain how the temperature of the body is constantly kept at the same uniform standard—at 98° —while the temperature of the atmosphere, and of surrounding objects, is almost always a good deal lower, and is continually varying.

It had long been known that the blood in the arteries and in the veins was of different colours: in the veins and right side of the heart, of a dark purple hue; in the left side of the heart and in the arteries, of a bright vermilion colour. It was also known that this change, from venous to arterial blood, was brought about, in some way or other, in the lungs. Animal chemistry then showed that the alteration was produced either by the *oxidation* of the blood—by oxygen imbibed into it,—or by its *decarbonization*—by carbon liberated from it,—or (and this is now the commonly received opinion) by both.

Dr. Crawford found by repeated and well-conducted experiments that the blood thus changed,—that arterial blood,—has a greater capacity for heat than venous blood, and that in it it becomes quiescent or latent. He also found, and this is most remarkable, that the air which we expire has a smaller capacity for heat than the air which we inspire has. For during respiration the air is altered as well as the blood. When received into the lungs the atmospheric air ordinarily consists of 21 of oxygen, and 79 of azote or nitrogen. While it remains in the lungs it loses from 2 to 6 per cent of its oxygen, and obtains an equal quantity of carbonic acid gas. Its capacity for caloric is lessened and heat is liberated; which is transferred to the arterial blood and becomes latent in it. The intercepting membrane, which separates the blood in the bloodvessels from the air in the air-cells is (as we noticed before) so thin that it neither prevents the chemical changes which both undergo; nor does it hinder the transfer of heat, from the air into the blood, which takes place in consequence of those changes. Little by little during its diffusion over the system the arterial blood parts with its oxygen. It again becomes venous. In consequence of which its capacity for heat is lessened, and heat is set free. Again it returns by the veins, through the heart to the lungs, to be re-purified and re-warmed.

This “Theory of Animal Heat,” though seemingly damaged a good deal by some subsequent experiments, has borne the test of time, and is now by most Physiologists considered to be the true explanation of the function.

If the temperature of the atmosphere and of the bodies which surrounds us, is below 98° —our own degree of heat—as it commonly is; then we are cooled partly, either by *radiation* or *communication* of caloric to them, as other substances, whether organic or inorganic, are cooled; and partly by *insensible perspiration*. When the temperature

of the air is above 98° , or if by exertion the body would be overheated, then we are kept cool by larger amounts of the insensible, and by the *sensible perspiration* or *sweat*, with which the surface becomes dewed.

On the top of the trachea the *Larynx* is fixed, like a capital on the summit of a column. It is an irregularly-shaped musical box, constructed of separate pieces of cartilage, or separate cartilages fastened together by suitable ligaments. Anatomists differ about the number; some say there are nine, others only five pieces. It will facilitate the reader's acquaintance with them if we assume that there are but five, and that the other four are offsets from these. They are named the* *Thyroid*,¹ the *Cricoid*,² the two *Arytænoid*³ cartilages, and the *Epiglottis*.⁴ This last, of a semi-oval shape, is attached to the base of the tongue, and forms the flap by which the air-tube is most accurately closed during the act of swallowing. The *Thyroid* cartilage consists of two broad laminae, placed angularly in respect of one another. The projection thus formed may readily be felt in the forepart of the throat. Under the thyroid, and immediately in connexion with the upper end of the trachea, to which it is firmly attached, lies the *Cricoid*; it is ring-shaped, and completely circular. On the upper edge of the cricoid cartilage, at the hinder part, the two *Arytænoid* cartilages rest, side by side. They are of a pyramidal shape, the apex being placed upwards. The *offsets* form points of attachment for muscles, and contribute to the perfection of the instrument.

An abundant supply of muscles provides for the accurate adjustment of the whole apparatus, and of each separate part. It is well furnished with nerves of both kinds: for sensation

* These are rather hard, but they are not unmeaning names. 1 signifies, like a shield; 2. Like a ring; 3. Funnel-shaped; 4. Upon the windpipe.

and motion. Two ligaments extended from the angle of the thyroid and fixed in the arytenoid cartilages form the *proper vocal cords*. Other two, above them, stretched in the same direction, but less definitely constructed, are called the *superior or ventricular cords*.

The fissure between the vocal cords is termed the *Rima* of the Glottis.

By the vibrations of these cords the *sound of the voice* is produced.

We intended to describe the remarkable powers of this beautiful instrument; and to particularize the services rendered by the tongue, the palate, the lips, the teeth, and the other auxiliaries, when we speak or sing. We thought of saying something about the function of *secretion*, and of pointing out several of its curious varieties. We meant to notice the *hair*, the *nails*, and the *skin*: to remark upon the care with which all the machinery is *arranged* and *packed*, with reference both to its *security* and *usefulness*: and to direct the reader's attention to the *regularity*, the *constancy*, and the *consent* of the movements of the different parts: but these intentions are void; for, our little series of sketches ends here. They are confessedly, and indeed, of necessity, imperfect, and only in outline. If, however, the reader has been interested and, perhaps, instructed in some matters relating to himself, about which he ought not to be either uninterested or ignorant: and if, especially, he has been led to reflect upon and admire the wisdom and goodness of his Divine Creator and Lord—constructing him so skilfully, and endowing him so liberally—then, the purposes for which these papers were written have been attained.

P. S.

THE SHIPWRECK OF ST. PAUL.

CANTO III.

BUT now the fainting Afric breeze
Falls breathless on the sinking seas :
From all the far horizon round
A stillness, lurid and profound,
Spreads slowly o'er the crouching deep,
That, in its terror, feigns to sleep.
Some creeping horror petrifies
The expectant sea : the awful skies
Are flushed with a mysterious pain ;
As one, exorcised all in vain,
On whom the demon springs again.

Struck down in that portentous calm
The heavy sails collapse,
While, loosened sudden from their strain,
The swinging cordage flaps.
With nervous arms more sternly strung
The sturdy rowers bow,
And the sullen sea, reluctantly,
Still parts before the prow.

Now moaning winds are faintly heard
To battle far aloft,
The ruffian North swift charging down
On the South, sobbing soft.
And a long low ripple rears itself
Against the northern sky;—
Swept up before the raging storm
Higher, and yet more high,

With gathering strength it rolls along
 Nearer, and yet more nigh.
 Swift, swift as death, the monster comes,
 Lifting the livid deep,—
 Smooth, green, and vast ;—a moment past,
 And, with a hollow sweep,
 It springs upon the opposing swell,
 And all the whirling air
 Fills with white, wounded arms of spray
 Flung up in wild despair.

The blind sky, bowed upon the sea,
 Blackens, convulsed with agony :
 The fierce Typhoon,* with sounding sweep,
 Now drowns the roaring of the deep,
 And now the waves, to madness driven,
 Silence the stormy voice of Heaven.
 Entangled in the tempest's wheels,
 The fated vessel, staggering, reels :
 Each starting timber creaks and groans,
 The grinding spars in shriller tones
 Shriek to the ruthless wind ;
 While the rent sails, and cordage snapped,
 Float out in shreds behind.
 And in the pauses of the storm,
 Dull, deadened gurglings show
 How fast the insidious leakage gains
 Upon the hold below.

* These typhonic appearances were owing to the sudden shifting of the wind from south to north : the northern, or rather north-eastern gale, which produced this commotion by meeting the southern breeze, was itself a steady point-wind, lasting at least through the fourteen days and nights.—See Mr. Smith's "Treatise," chap. iii. p. 55-60.

Swift, swift, the hurtling hurricane
Spins southward o'er the boiling main :
Like a stunned creature, rising slow,
The ship recovers from the blow,
And staggers back to face the foe.
But now the strong north-eastern gale,
Heavy with volleys of thick hail,
Strikes her betwixt her quivering eyes,
And, dashed aside, she veers,—
Yet, still into the fierce head-wind
The steady helmsman steers ;—
Once more she struggles to the strife,
Though but again to fail,
Until the master gives the word
To scud before the gale.

And fast before the gale they drive
For many a stormy mile,
And run at length beneath the lee
Of Claudia's sheltering isle.
There, toilsomely, they drag on board
The foundering, shattered boat,
That in Fair Havens, that same morn
So gaily seemed to float :
And bind the vessel's starting planks
With circling undergirds,
—The swelling sides which that same morn
Were buoyant as a bird's.
But short the time for musing now,
And short the time for prayer,
Though the Centurion's conquering faith
Stood on his slain Despair.
For, let the fierce Euroclydon
Rage as it will, he hears alone

How the poor Jewish prisoner's Lord
Fulfils his servant's warning word.
Though blackest shades blot out the sky,
The veil drops from his inward eye,
And shows the Truth, so lately won,
Still clear, still spotless, still his own :—
Shows that the darkly threatening cloud
That lately o'er her brightness flowed,
Rose not from her : was but a part
Of his own weak, mistrustful heart,
That now in one broad sea of praise
Reflects the glory of her rays.

As Clauda's sinking headlands fail,
Once more they fly before the gale ;
And while the ship gives way apace,
A fresh alarm pales every face.
How shall they 'scape the Syrtis sands,
That grimly stretch their wrinkled hands
 Under the shallow sea,
Eager to snatch the helpless prey,
 Fast drifting to the lee ?
Through that mad-howling storm the crew
 Can catch no human sound ;
But steady eyes watch lip and hand,
And see the master's mute command
 To wear the vessel round.
With storm-sails set, and useless gear
All lowered, and the decks made clear,
Pausing once more, she doubtful sways,
But soon the guiding helm obeys ;
North-westward turns her shattered prow,
And fiercely on the starboard bow
Beats the relentless tempest now.

The last grey gleam of stormy light
Is blotted from the clouds,
And choking darkness, starless night
The seething ocean shrouds.
The long night past, day dawns at last,
And shows how still the gale,
Heard through the dark in ceaseless roar,
Lashes the watery threshing-floor
Beneath its sounding flail ;
While, light as chaff on every side,
The severed spray flies far and wide.

Again the dark, with strict embrace,
Strangles the gasping light,—
Again the struggling morn reviving
Escapes the fainting night.
But wan and pale ;—no change, no hope ;
Nor sun nor moon appear ;
The plummet-stars, by angel hands,
Dropped from the third bright sphere,
Night after night have failed to sound
The black and fathomless profound.

And now a stupid, blank despair
Settles on every visage ;—where
The lines of hope and fear were strong,
And wrestled for dominion long :
On cheek, and lip, and eager brow,
All is swept smooth and vacant now.
But, while with bloodshot eyes they gaze
Each on his fellow's stony face,
A well-known voice they hear,
That brings their courage back to life
With words of earnest cheer.*

* Acts, xxvii. 21-26.

For the resistless fire of Faith,
 The soul's electric stream,
 Pours on them with the speaker's breath,
 Till, in the very jaws of death,
 Despair melts like a dream.
 And well remorseful Julius weighs
 Each strong, direct, undoubting phrase,
 That, flying from the heart of Paul,
 Finds entrance in the hearts of all ;
 And marks the unastonished tone
 In which he makes the vision known ;—
 Fears not to trust the Truth at large
 Within her own all-powerful charge ;—
 And, cramped by no fastidious doubt,
 Speaks the full fact sincerely out,
 And styles his God, with steady nerve,
 He " Whose I am, and whom I serve."

The fourteenth night is come, and still
 The tempest blows as strong,
 And still through Adria's darkening waste
 The vessel drives along :
 But, as the midnight watch is set,
 Above the wailing deep,
 A muffled roar, unheard before, *

* The ship, it must be remembered, lay with her head to the wind, and, making due allowance for lee way, her course from Clauda to Melita would be N. $\frac{1}{4}$ W. Entering St. Paul's Bay in this direction, she would first pass the Point of Koura, its S. E. horn, and the warning sound of breakers would then be first heard, and heard almost *astern*, as the vessel drifted sideways into the bay.

After a while the sound would die away as she neared the centre of the bay, and would again be heard, but now on the lee-bow, as she drew towards its N. W. corner.

The dry exactness of these notes will be pardoned by those who con-

Forewarns them of a rock-bound shore,
 On which the breakers leap.
 Soon, as the vessel sideways drifts,
 The mariners discern
 The surf that, scarce two furlongs off,
 Comes tumbling close astern.
 Now, hastening aft to heave the lead,
 Fathoms twice ten are found ;
 And soon the breakers, eastward left,
 Roll with a smothered sound.
 "Now fix the windlasses astern,*
 Fitted with cables four,
 And summon every hand to drag
 The anchors from the prore,
 That when the morning dawns, we yet
 May run the ship ashore ;
 But, ere they grapple with the ground,
 Heave out the lead once more."
 Now while the fifteen-fathom line
 Tells of the shallowing sea,
 That hollow roar booms up once more,
 Loud on the vessel's lee ;
 Each moment more distinct, till now
 It sounds close on the larboard bow ;
 Then promptly at the Master's call
 From the high stern the anchors fall ;

sider the importance of accuracy in anything touching Scripture. For a clear and full exposition of the subject see Chap. IV. of Mr. Smith's Treatise.

* "The proximate cause of anchoring was no doubt that assigned by St. Luke, namely, the fear of falling on the rocks to leeward ; but they had also an ulterior object in view, which was to run the ship ashore as soon as daylight enabled them to select a spot where it could be done with a prospect of safety : for this purpose the very best position in which the ship could be, was to be anchored by the stern."—See Mr. Smith's Treatise, chap. iv. p. 92.

Heavily passes night away,
 And slowly comes the wished-for day.
 Slowly the heavy folds withdrawn
 Reveal the first faint hints of dawn ;
 No longer heard and felt alone,
 Within the tossing ship,
 The monstrous billows rolling on
 Upturn the yawning deep ;
 But, sliding 'neath the glimmering light,
 Their jagged crests appal the sight.
 Near thrice a hundred anxious eyes,
 As slow expand the widening skies,
 Are fixed upon that iron coast,
 On which the plunging breakers tost,
 Now rise in founts of angry spray,
 And now, with strong recoil,
 Drag crushed and mangled fragments back,
 As baffled Adria's spoil :
 And brave hearts shudder as they read
 Their ghastly fate too well portrayed.

'T were long to tell in measured strain
 How all those fears proved false and vain.
 And, far as memory can look back
 Along life's hazy, narrowing track,
 We fail to find the early time
 When first that shipwreck scene sublime
 Was painted on our hearts ;
 Familiar from our childish years,
 Far/as we gaze it still appears,
 Complete in all its parts.
 By youngest fancy drawn so plain,
 Who would re-touch the sketch again ?
 To risk the spoiling of its bloom,
 Or place another in its room ?

How well upon our hearts is drawn
The opening of that anxious dawn ;
And how the prisoner Paul
Took bread, and thanked his God, and broke,
And ate before the crew, and spoke,
Cheering the hearts of all ;
Saying that not a single hair,—
So safe were they in God's good care,—
From off their heads should fall ;
And how, when all had eaten free,
They cast the wheat into the sea.

Next, as the fuller daylight burned,
And they knew not the land,
How anxious eyes a creek discerned,
With a small beach of sand ;
Where minding to thrust in the ship,
They weighed their anchors from the deep,
Shook out the artemōn afore,
Loosed either rudder-band,
And boldly made towards the shore
Where lay the creek and strand :
How, driving in, they found the tide
Had worn a passage, channelled wide,
Where two opposing currents met
Behind the isle of Salmonet,
Thus severed from the land :
And how the hapless vessel's prore,
Stuck fast in sand and mud,
The while astern, with fierce uproar,
Rushed in the raging flood :
And then how, every peril passed,
All safely reached the land at last.

But though all this, and more than all
That later musings win,
Is bound up in the first bright sheaf
That Memory garnered in,
And bound so close that all in vain
We strive to chase away
The fancy quaint that still persists
That shipwreck scene to lay
Within some old familiar haunt,
Some sunny English cove,
Where, in the long departed years,
Our steps were wont to rove :
Yet, dreaming thus, perchance we fail
To grasp the substance of the tale.
Then pardon the presumptuous song
That thus has fondly lingered long
On the old theme, and made it new,
With variations strange but true.

The mightiest Singer of the Greeks,
(’Tis thus a hoary legend speaks,)
Stood blind amid the trancèd throngs
Hurrying, soft-paced, to hear his songs.
His fame, a living, breathing flood,
Surged to his feet ; and yet he stood
Grandly unconscious, though the quay
Of Chios shone in one broad sea
Of sunlit heads, that with the swell
Of Troy’s great epic rose and fell.
And still, yet in far different wise,
Blindness hangs thick in poets’ eyes :
He sang to crowds, and felt alone ;—
We dream of listeners, and have none.

Yet if perchance some earnest ear
This borrowed tale has bent to hear,
Nor closed itself in angry haste
Against the dull, officious waste
That toils to gild refinèd gold,
Loading with rhyme the sea-tale told
In such sincere and graphic phrase,
By one who all those weary days,
Immured within the tossing ship,
Drifted through Adria's foaming deep,—
If such there be, then, ere we part,
The pungent moral lay to heart.

For though the tale, divinely told,
Is just as purely true,
As if its straight, bright warp of story
No woof of meaning knew ;
Yet, ne'ertheless, a moral fine
Runs interlacing every line :
'Teaching how true those words of Heaven,
"To him that hath shall more be given ;"
While we, half-hearted ones, shall lose
The faith we have and fear to use ;
Unless God's kind severity
Blacken with storms our sunny sky,
That wrecked upon some rugged strand
Our souls may yet escape to land. F. A. P.

REVIEW OF THE MONTH.

UNSUCCESSFUL authors—and successful authoresses—are apt to say hard things about the booksellers; and if evil imaginations do not occur to themselves, they are sure to be suggested by friends, who, mingling a little malice with not a little flattery, exclaim, “And do you say that that is all you got for your book?” Dr. Johnson got fifteen hundred and seventy-five pounds for his Dictionary, and Boswell once said to him, “I am sorry, sir, you did not get more.” His answer was, “I am sorry too. But it was very well. The booksellers are generous, liberal-minded men.” We subscribe to this deliverance which a sense of justice extorted from the gruff moralist. No doubt there are exceptions; but, just as we believe that of the learned professions the physicians are the most humane, so among the trading and mercantile professions we are inclined to think the booksellers the most generous. These remarks we have been led to make in connexion with the name of Mr. David Bogue, the well-known publisher, who died very suddenly on the 19th of November. It is only a small portion of his liberal and kind-hearted deeds which have come to our personal knowledge; but these are enough to assure us that many of those tears will be shed for him which fall on the good man’s grave. Quiet and too retiring, he was a man of excellent ability, and was gifted with a keen æsthetic instinct, which enabled him to detect and bring forward authors and artists who, but for his hearty patronage, might have remained unnoticed or obscure. Honourable and upright, and, like other first-class publishers, disdainful of all quackery, he was remarkably successful in business; and many of our

most beautifully illustrated works, as well as many of our most popular poems, bear his imprint, and of a popular series for the young he was himself the author. Exemplary in every relation,—as a husband, father, citizen, and member of the Christian Church,—and exceedingly endeared to his intimate friends, Mr. Bogue's early and unexpected death has diffused through a wide circle a deep sensation.

Under the title, "Records of Longevity," Mr. T. Bailey has compiled a very curious and amusing volume; and with the motto, "Diligent in business—fervent in spirit," Mr. Owen, a Church-of-England clergyman, has given us a lively, wise, and warm-hearted biography of Mr. Thorneycroft, a Wesleyan layman. It would be hard to find a more charming example of the "poetry of science" than Dr. George Wilson's little volume, "The Five Gateways of Knowledge;" and no poetry, commonly so called, has appeared within the year which we have enjoyed so much as Gerald Massey's "Craigcrook Castle." The "Mother's Idol Broken" is sadly touching, and some of the war-songs have the force and fire of Pindar.

A twofold treat has been provided for those who love the good and the beautiful combined in Grahame's "Sabbath," illustrated by Birket Forster, and in the "Book of the Patriarch Job," illustrated by John Gilbert. The designs of the latter come up to our idea of what a pictorial "Job" ought to be; not mere drawings of dry museum specimens, on the one hand, nor the half-heathen rant and exaggeration of draughtsmen, like Blake and De Louthembourg, on the other; but modest and suggestive renderings of the text, where the imagination and feeling of the artist bring latent meanings into relief, and aid the reader's eye, as music aids the listener's ear.

If we remember aright, the same New-year's day ushered into existence the first number of the "Library of

Biblical Literature," and the first number of Lardner's "Museum of Science and Art," as well as the first number of ourselves. Many of our contemporaries have long since expired; but the two above-named have lived, and have received the encouragement which they well deserve. The idea of each series is so nearly akin that we name them together; and, as companions to our own miscellany, we would heartily commend them both to our readers,—the one with its physical science popularised, the other with its admirable elucidations of Scripture.

Want of time and space prevented our noticing last month the interesting meeting of the Young Men's Christian Association, held on 25th September, to take leave of Mr. T. H. Tarlton, on his retirement from the office of Honorary Secretary. The report of the proceedings is appended to our present number, and by many of our readers it will be perused with lively interest. From the retirement of Mr. Tarlton, we should have apprehended disastrous consequences to the society, were it not that his place is to be filled by one so worthy of being his successor, and who has already done so much for the best interests of the Association, as Mr. W. E. Shipton.

From statistics compiled by "The Christian Witness," it appears that there are now in the world 88,250,000 Protestants, and 159,000,000 Roman Catholics. Of the Protestants, Great Britain (excluding Ireland) and the United States contain equal numbers, or twenty-one millions each; and of the entire number, a majority, or forty-eight millions, speak the English language. What a proud pre-eminence this gives to Britain and the United States; and what a motive to cordiality and co-operation between countries, which, with their heritage of light freedom and commercial prosperity, if true to their opportunity, might be the teachers, the evangelists, the regenerators of the world!

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