



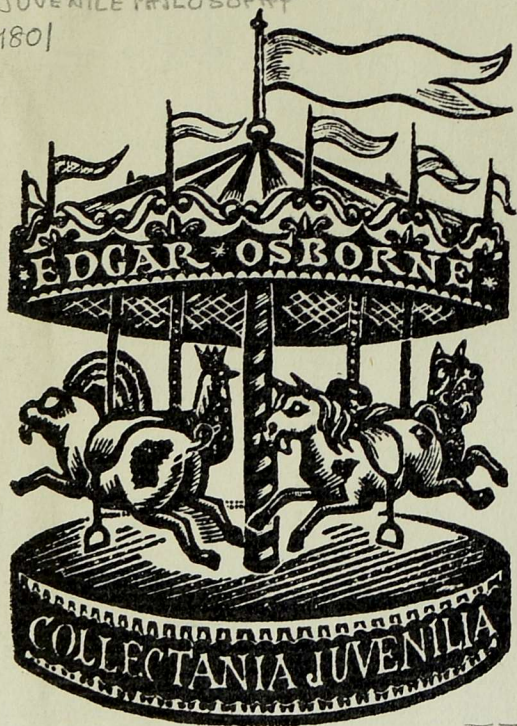
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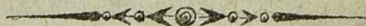
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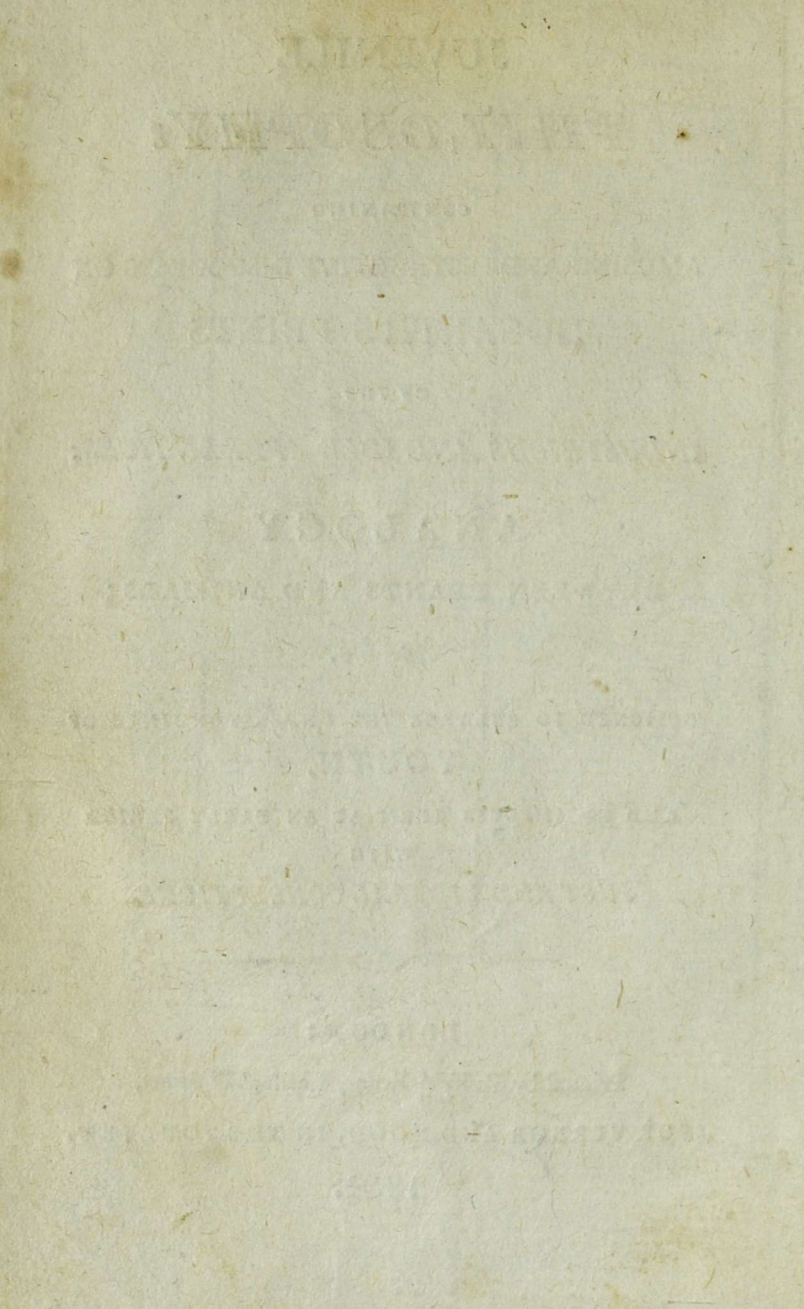
JUVENILE
PHILOSOPHY:
CONTAINING
AMUSING AND INSTRUCTIVE DISCOURSES ON
HOGARTH'S PRINTS
OF THE
INDUSTRIOUS AND IDLE APPRENTICES;
ANALOGY
BETWEEN PLANTS AND ANIMALS;
&c. &c.
DESIGNED TO ENLARGE THE UNDERSTANDINGS OF
YOUTH,
AND TO IMPRESS THEM AT AN EARLY PERIOD
WITH
JUST AND LIBERAL CONCEPTIONS.



LONDON:

Printed by Ruffy & Evans, Leadenhall Street,
FOR VERNOR AND HOOD, IN THE POULTRY.

1801.



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JUVENILE STORIES.

INDUSTRY AND IDLENESS.

MRS. Wilson superintended the education of her own children, in which duty she was indefatigable. She not only toiled through the drudgery of giving them lessons on various subjects, but these lessons were accompanied with lectures, to explain what might be above their immediate comprehension. Directions were also given to render their tasks as easy and as familiar as their several subjects rendered possible :

but she frequently told them, that learning was not in its nature of easy acquirement; that truth, as the old proverb says, lay at the bottom of a well;—the meaning of which was, that truth, or knowledge, required labour and search, otherwise every body might be learned; and that respect which was now paid as a mark of distinction to those who were in possession of her rich treasures, would cease.

Mrs. Wilson had two sons, Master Thomas and Master James. The former had not the least propensity to improve his mind in any way in which his mother had yet made the attempt. Encouragement and punishment were both attempted, but more frequently the first, all in vain.

Add

Add to this, in his playful frolics he had moreover shewn a temper somewhat violent, on which fear had no restraint, nor danger, however apparent, could repress his ardour. This conduct gave many a pang to Mrs. Wilson, who struggled hard to conquer his perverse habits, and turn his thoughts towards the improvement of his mind. She had one ray of hopeful expectation from a certain trait of his disposition. He had a deal of pride; would be the first actor in every exploit; but through all his mistakes she never observed that he had told her an untruth, chusing rather to risk the event, whether for or against himself, whatever danger looked him in the face. This was the sheet-anchor on which she

rested ; and this principle she knew must be cherished, nurtured, and, if possible, perfected.

Master James, on the other hand, was every thing that the fond mother wished. Whatever was his task, he pursued it with ardour ; he overcame every difficulty ; he excelled in what he undertook to learn ; and he had already learnt more than is usually acquired by a boy then only eleven years old. Brother Thomas was in his twelfth year.

Besides his learning, his temper was of the mildest. He was dutiful to his mother ; respectful to his different teachers ; kind to the servants ; and civil to every body. He was beloved and admired through the whole family, and by every one
who

who knew him. He always took the part in favour of his brother Thomas, if any slight word was said against him; yet he would sometimes, but that seldom, and then in the mildest terms, reason with his brother, but without effect.

The good mother one morning came into the school-room: "My dear children," says she, "I have a treat for you this morning of a new kind:—a set of prints, the Industrious and Idle Apprentices, by Hogarth. We will turn over the prints, and I will endeavour to explain the particulars. You must know that Hogarth was both a painter and engraver of singular merit, and in a particular line, not attempted by any one before his time, nor proba-

B 3

bly

bly will be ever equalled by any one that succeeds.

“ In most of his prints, besides much humour, there is conveyed a moral lesson ; good and bad conduct are put in contrast with each other, and the causes shewn in different characters, which produce certain effects ; and this is conveyed to the eye with more force by means of his rich pencil, than could be effected by the language of the most eloquent writer.

“ These plates, or engravings, which I have in my hand, contain the history of two boys ; one idle, the other industrious. I mean no allusion (*seeing Thomas appear fretful*): they were both beyond your ages, and both apprentices, which, probably,

probably, you will never either of you become." So delicate was Mrs. Wilfon in all her tasks and discourses; she strove rather to soothe and heal, than irritate the passions of Master Thomas.

"These two boys were fellow-apprentices, under equal advantages, and about equal ages we may suppose, when bound to the trade of a silk-weaver, a very respectable business about fifty years ago in London. Although these two youths at the early period of about fourteen were upon equal terms, yet the effects of idleness upon one, and industry upon the other, is here exemplified under a variety of forms and aspects through the period of their lives. For it is a certain fact, that idleness
and

and wickedness produce poverty, ignominy, and sometimes untimely death; and that industry and integrity procure competency, respectability, and tranquillity of mind through the whole of life, and at that awful period when guilt is armed with all its terrors.

“ The first plate should be a day of work,—but instead of that, the painter shews the idle boy, whom he properly names Thomas Idle, asleep in his loom, with all the symptoms of idleness both in his dress and person; his hair uncombed, his coat in tatters, the collar of his shirt open, the 'Prentice Guide, a book, probably given by his master not only to him, but to all under
his

his care, torn and lying on the floor; upon a part of the wall is pasted the ballad of Moll Flanders; near him is a tobacco-pipe and porter pot, two pieces of furniture which strongly shew the froward temper of the youth at this period of life. In this posture of affairs enters his master, with looks of anger painted in his countenance; his cane as if in the action of going to strike and correct him, who, it seems, was not to be cured. By way of humour, the painter has placed a cat sporting with the shuttle, which hangs dangling from the web at which Thomas Idle should have been at work. The motto to this, for Hogarth chose a motto to every one of these pieces from the Scriptures, as he intended

tended that each should convey some useful lesson, is, *The drunkard shall come to poverty, and drowsiness shall clothe a man with rags*: PROV. ch. xxiii. ver. 21.

“ In the same plate is the other apprentice, whom the painter names Francis Goodchild, at work, composed, serene, and attentive; his countenance mild, his dress clean and neat. Over his head hang those two famous old ballads, “ Turn again, Whittington, Lord Mayor of London,” and the “ Valiant Apprentice;” and near him is the ‘Prentice Guide open, as if he often looked into it, yet the book is clean, and without a torn leaf. The motto, *The hand of the diligent maketh rich*: PROV. ch. x. ver. 4.

“ The

“ The next plate the time is Sunday, and when he shews his favourite, Francis Goodchild, at church, in the company of his master’s daughter, both looking over the same book, attentive to their duty, and in that part of the service in which they are singing forth the praises of their God. The dress of both these figures is simple and neat; their looks full of devotion, and as if impressed with awful respect towards that being whom they came to worship, in this sacred place. Some have fancied a liking betwixt these two, Miss West, the name of his master’s daughter, and Francis Goodchild. The motto, *O how I love thy law; it is my meditation all the day*: PSALM cxix. ver. 97.

“ The

“ The next plate shews us a very different scene to the last. Instead of attending divine service, Tom Idle is seen at his length upon a tomb-stone, in the church-yard, playing at a game called *hustle-cap*, for half-pence. His companions seem well selected ; of the very lowest order of society ; full of filth, as appears from the hands of one vigorously applied to that part which both affords shelter and pasture to a certain clan, which always attend the slothful ; whilst another seems as busy to dislodge the same vermin who are marching across his breast. This youth, from the basket and brushes, appears a shoe-black, all rags and tatters ; his hair peeping through his scull-cap, his elbow bare

to

to the very wrist, and his naked toes appearing through the end of his shoe. The third figure is an old man, whose age should have taught him better : —the others are but youths. This hoary sinner who, as we perceive here, corrupts, we shall afterwards find betrays him, whom he has trained up in vice. This figure has a patch over one eye ; on his head a striped woollen cap, a dress much used by old people fifty years ago, but seldom seen at present ; his hands uplifted as if deprecating, or swearing that the hat should be removed, for the youngster was playing foul. Their clamour and oaths have been so loud, as to arrest the attention of the church beadle, who, with his uplifted stick, is on the

14 INDUSTRY AND IDLENESS.

point of laying a pretty smart stroke across the shoulders of Tom Idle. The motto, *Judgments are prepared for scorers, and stripes for the back of fools*: PROV. ch. ix. ver. 29.

“ Plate 4. Goodchild’s conduct had so endeared him to his master, that he is taken from his former labour in the looms to a more honourable post in the counting-house, where he is intrusted with the care of the business, and makes entries in the day-book. To his charge is committed not only the keys, but the purse, which appear in his hands; whilst he is, with mildness and attention, listening to the directions of his master, who, with the most placid countenance and regard, seems
to

to say to him, *Here is one in whom I can trust*: and this sentiment is strongly impressed, not only by the lines of satisfaction on his face, but by the action of leaning (a symbol of reliance) upon the shoulder of him in whom he had placed his confidence. The eve of the partnership is said to be hinted by the two gloves being united upon the desk. The early industry of our young hero is also well hinted at by the head-piece to a London almanack, *INDUSTRY TAKING TIME BY THE FORELOCK*. Sets of looms, and weavers at work, are on the background. The motto, *Well done, thou good and faithful servant; thou hast been faithful over a few things,*

I will make thee ruler over many things: MATT. ch. xxv. ver. 21.

“ A very different story is told to that which we find in the last plate. In this, we perceive that Tom Idle, for bad conduct, had been dismissed his former master’s service, and is entering upon a new course of life; not like that of his fellow-’prentice, Francis Goodchild, into an advanced station, but into that which is generally the last refuge of the idle.

“ He appears to us here in a boat, in his passage towards the ship; and to shew his hardness of temper, and contempt of every thing, has just tossed his indentures into the sea, which are seen floating alongside of
the

the boat. His mother, from her dress, seems a widow; and this graceless son may be the only child of this mother, from the anxious concern manifested by her attitude, and in her countenance, at the conduct of her dear Tom, that has brought him into a state from which he may never again return:—and happy would it be for thee as a mother, if thou wast never to see thy son again! Nay, his conduct appears even to his comrades, the sailors, so void of feeling, that one is pointing to a gibbet on the shore, as much as to say, “Young man, you will come to that at last.” A second holds over him a cat-o-nine-tails, and seems to say, “You will taste of this shortly, my lad:”

whilst Graceless holds up his hand, with his fingers in a posture of the most ineffable contempt, and with a countenance in tune with the action of his hands; accompanied, we may suppose, with phrases, which, if known, would not be proper here to repeat. The motto, *A foolish son is the heaviness of his mother*: PROV. ch. x. ver. 1.

“In plate sixth is shewn, industry crowned with success: the reward, not less than the hand and heart of his master’s daughter. Here are displayed the gratulations of a number of people attending the mansion of Mr. Goodchild, the morning after the day of his marriage with Miss West; a band of music, in which
appear

appear drums and other instruments, with a woman singing the song of *Jesse, or the happy pair*.

“ The happy couple appear in their morning dress at the window, which is thrown open, and where they are distributing their bounties. The house seems not only the mansion of peace and happiness, but that of plenty : a servant is seen giving away the remains of the marriage feast of yesterday. In the sign is announced the partnership commenced between West and Goodchild. The motto, *A virtuous woman is a crown to her husband* : PROV. ch. xii. v. 4.

“ And now, my dear children, as we have got half way through our work, and have brought one of the
young

young men at least to so happy a period of life, suppose we stop for the present, lest I should weary you."

"No, no! if you please, mama, go on," says James; "that is, if my brother Thomas is not tired. I could listen till noon myself, if the story did not tire you, mama."

Mrs. Wilson looked towards Master Thomas, who had not uttered one word during the whole explanation and exhibition of the plates. He had sometimes, and it was music to the ears of his mother, endeavoured to suppress a sigh, at the tale of Tom Idle. After James's express wish of seeing and hearing the story, and perceiving no languor on the countenance of Thomas, their mother proceeded as follows.

"Instead

“ Instead of the pleasing scene which the last exhibited, Plate 7 shews us the sailor returned from his voyage, but not reformed in his manners. It is a morning scene, after spending some part of the night in the company of a prostitute, having given up the sea for the highway, as appears from the pistols, watches, ear-rings, &c. which lie scattered upon, or near the bed, the plunder of the former part of the night; after which dreadful work, he has sought in vain for repose in this wretched garret, in the arms of this wicked woman. I say in vain; for can terror be more strongly depicted, than in the agitated and terrified features of Tom Idle? His hair stands an end; his hands lifted
up,

up, and his fingers spread out, shew the inward agony of a fearful conscience.—We will just turn back to view the serene morning face of his fellow-'prentice, by way of contrast.—My dear children, let us examine this lodging more minutely. The most conspicuous part of the furniture is the bed, in a ruinous state, and without any curtains; and the remaining contents, so far as we can perceive, are a broken jug, a pipe, a knife, a plate, a dram-bottle and glass: and to obtain admission into this miserable lodging,—for admission he could not obtain without purchase, and a day of honest labour might have procured a better,—this wretched lodging, on the present occasion, has cost him no less

less than the price of——LIFE!——
 His own life has been forfeited to the laws of his country, not only by his plunder upon the highway, but by an act of murder on the person robbed. To secure himself, the door is locked and double bolted, and barricadoed with two very strong planks taken from the floor. But his guilt was stronger than bars and bolts; for, notwithstanding these precautions, we see his attitude of agony, which, however, proceeds only from the noise of a cat having slipped down the ruinous chimney of this garret, and the cat, accompanied by some brick-bats, is just making her entry through the chimney into the room. Whether the painter intended to shew the animal instinct,

instinct, or wretchedness of place, we can only guess, but a rat is seen to scamper across the room at this moment of time. As we may suppose these vermin were not the only tenants of this abode, it serves to heighten our disgust. The female, regardless of him or his feelings, in the midst of this scene, is greedily feasting her eyes with the articles of plunder, one of which she holds in her hand, and views with much pleasure. The motto is, *The sound of a shaken leaf shall chase him*: LEVIT. ch. xxvi. ver. 36.

“ From industry has been acquired opulence; from integrity has been obtained respectability; and our merchant arrives, by a well-earned
good

good name, to the high honour of being elected sheriff of London. Plate the 8th is chiefly taken up with a view of a city feast, at which there is generally plenty of cheer for those who are fortunately partakers; and is frequently made a subject of ridicule by such as are debarred from sharing in these convivial meetings. The motto is, *With all thy gettings, get understanding: exalt her, and she shall promote thee: she shall bring thee to honour when thou dost embrace her;* PROV. ch. iv. ver. 7 and 8.

“Honours have been the rewards of diligence and a good name, acquired by upright dealings.—We may observe the reverse of this picture

D

ture

ture in Plate the 9th, with the consequences of sloth, and its usual attendants, vice, loss of character, &c.

“ This scene is in a night-cellar ; the time about ten o’clock, as appears from two watches ; and wherein the principal figure is this idle youth, after the depredations of the night, displaying his spoils, with one who, if not an accomplice, is a partaker ; and this person is the old man, with the patch over his eye, and the woollen cap upon his head ; and who, probably, was the first person who seduced the thoughtless youth from those paths which would have insured peace.

“ The contents of the pocket are collected into a hat ; a pistol lies upon the cellar floor, another appears

pears half way out of his pocket. At this moment of time, betrayed by the very woman with whom we saw him in company in the seventh plate, and is now receiving a purse from the peace officer, who is in his descent on the steps, with two officers behind, each a lantern in his hand. This woman, whom but the night before he had believed to be his friend, points out to the officer, by a motion of her hand, the person after whom they are in search.

“ In this small space under ground there is much business. In the back ground in this picture is shewn a violent fray; an uplified chair and fire-shovel are the weapons of war displayed. But blood has already been

been spilt:—a man that has been murdered, is with the utmost coolness let down into a cavity, made in the floor for the purposes of concealment. Cards scattered upon the floor shews one of the varieties transacted in this under-ground sink of iniquity. The motto is, *The adulteress will hunt for the precious life*: PROV. ch. vi. ver. 26.

“ In Plate 10th is shewn the Hall of Justice, in which the industrious apprentice is the chief magistrate, and to whose lot it falls, after examination, to commit to Newgate his once fellow-'prentice Thomas Idle. The magistrate is so affected with the circumstance, that he seems overcome by sensibility; but

but justice must not yield to tenderness. The prisoner, with bended knees and uplifted hands, intreats for mercy from him with whom he was once upon terms of equality. The bar upon which he leans seems scarcely sufficient to support his frame, in torture, not only from his situation, but that his weakness should be thus exposed before the companion of his youth, whose example and repeated admonitions he had despised. Self-convicted, his whole frame seems agonized with remorse.

“ Amongst the group appears the mother of this graceless son, in all the agony we may suppose a mother to feel for the fate of her child, with a handkerchief in one hand before

her face; the other is in the attitude of intreaty with a constable, whose hands are graced with a staff, and whose bulky body seems further swollen with the importance of his office; and this mighty magistrate of the night furlily seems to say, "We that are in power must do justice."

"Here again appears the one-eyed wretch who first led astray the steps of this youth, and whom this debased villain deliberately betrays, by turning evidence against him whom he had seduced, to render this piece of villainy more complete; whilst the magistrate's face is covered by his hand through grief of heart. The wicked woman whom we have twice before seen, offers a
bribe

bribe to the clerk, by putting it into his hands, which are for that purpose behind his back, the better to conceal his knavery ; and all this to suffer the old sinner to lay his left hand upon the book, whereupon he is going to take the usual oath, instead of the right*. The sword and pistols found upon the prisoner are displayed by a watchman ; and the alderman's clerk, for Mr. Goodchild is both alderman and magistrate, is at his desk making out a warrant of commitment, directed to the turnkey of Newgate. There are two mottos to this ; *Thou*

* It is said, that there are wretches so ignorant, or so hardened, as to consider this circumstance of a left-hand oath a complete salvo for false swearing.

Shalt

shalt do no unrighteousness in judgment: LEVIT. ch. xix. ver. 15.—
the other, The wicked is snared in
the work of his own hands: PSALM
ix. ver. 16,

“ Plate the 11th exhibits the final and melancholy close of a life, which had been spent in sloth and vice. This victim to his own follies is on the road to Tyburn, and within sight of that place, from whence, in a few moments, he must be plunged into eternity. The pale and ghastly figure, with a book in his hand, attempting to lift his voice to seek mercy from that God whose laws he had violated, and whose precepts he had spurned, shews how ill his mind is at ease ;—his looks proclaim
 horror

horror and remorse of mind. Along with him in the cart is a minister, who, by the action of his hand, bids him look up*.

“ Ma-

* A solemn exhortation was formerly given to the criminals condemned to die at Tyburn, in their way from Newgate. Mr. Robert Dow, merchant taylor, who died in 1612, left 11. 6s. 8d. for ever, that the bellman should pronounce to the unhappy persons as they passed by in the cart, a most pious and awful admonition. An admonition of the same nature was delivered in the prison of Newgate the night before they suffered, which is subjoined hereto.

“ You prisoners that are within,

“ Who, for wickedness and sin,

“ After many mercies shewn unto you, are now appointed to die to-morrow in the forenoon; give ear, and understand, that to-morrow morning, the greatest bell of St. Sepulchre's church shall toll for you, in form and manner

“ Maternal affection has overcome sensibility or propriety. Here is again the mother, for the last time to look upon

manner of a passing bell, as used to be tolled for those who are at the point of death ; to the end, that all godly people hearing that bell, and knowing that it is for you going to your deaths, may be stirred up heartily to pray to God, to bestow his grace and mercy upon you whilst you live. I beseech you, for JESUS CHRIST's sake, to keep this night in watching and prayer, to the salvation of your own souls, while there is yet time and place for mercy, as knowing that to-morrow you must appear before the judgment seat of your Creator, there to give an account of all things done in this life, and to suffer eternal torments for your sins committed against him, unless upon your hearty and unfeigned repentance, you find mercy through the merits, death, and passion of your only mediator and advocate, JESUS CHRIST, who now sits at the right hand of God

upon her living son. She, too, is conveyed in a cart; her face concealed from the view by her handkerchief.

God to make intercession for as many of you as penitently return to him."

Admonition to the condemned criminals as they are passing by St. Sepulchre's church wall to execution :

" You that are condemned to die, repent with lamentable tears. Ask mercy of the Lord for the salvation of your own souls, through the merits, death, and passion of JESUS CHRIST, who now sits at the right hand of God to make intercession for as many of you as penitently turn to him.

" Lord have mercy upon you !

" Christ have mercy upon you !

" Lord, &c.

" Christ, &c."

" At

“ At this awful scene the painter has indulged his fancy with many figures, amongst the crowd of people always collected to see one of these melancholy fights.

“ The motto is, *When fear cometh as desolation, and their destruction cometh as a whirlwind; when distress cometh upon them, they shall call upon God, but he will not answer:* Prov. ch. i. ver. 27, 28,

“ The 12th, and last, plate, finishes the story; and the conclusion is, that Francis Goodchild, after having acquitted himself with propriety, not only in his general conduct, but in elevated stations, is at last elected the chief magistrate of the city of London: and the whole of this con-

sists

sists of a cheerful group joining the procession of the lord mayor of London through the streets in his state coach. The scene is laid on the east side of St. Paul's churchyard, just turning into Cheapside. The painter having finished his story, and brought his hero to this high honour by dint of industry, has nothing left but to fill up his picture with such sort of people as usually attend these kind of shows. The motto is, *Length of days is in her right hand, and in her left hand riches and honour*: PROV. ch. iii. ver. 16.

“ And here I will conclude my remarks, as I am afraid you are both already weary: I will, therefore,

E

fore,

fore, only observe, that if in the course of human affairs every idle and wicked person does not absolutely come to the gallows, nor every diligent and industrious one arrive at honours, yet they are such frequent consequences, as to render the painter's story highly probable."

Master Thomas, during the whole of this time, had not uttered a single word; nor did he scarcely open his lips at dinner: he appeared thoughtful, and not at his ease. As soon as the cloth was drawn, contrary to his usual custom, he withdrew from table, and fauntered into the fields;—his thoughts were totally absorbed with the morning's subject. He had been often reproached for idleness by his different masters, but he
 had

had never supposed that any evil could arise from that:—some silly person had told him, that he had neither occasion to work, or to learn anything. But he now began to think that there must be some difference betwixt industry and idleness, for his brother James was the most industrious boy alive. He was the friend of every body, and every one was the friend of James; and when he considered himself,—he was not sure that he had a single friend but his mother, who, though she reprimanded him sometimes in private, had a word to say, if possible, in extenuation of his frolics. Then he turned over in his mind the wretched end of Thomas Idle;—the thought of infamy made him sick at

heart. He had committed frolics to render his name *famous*; but the word *infamous* was a bitter pill. Well as he loved his brother James, and he was the only one, except his mother, that he had any regard for, yet he could not bear the thoughts that the younger brother should obtain superiority over the elder, whilst there were means of yet preventing it. "Shall I, therefore," said he to himself, "renounce all my mischievous pranks, and attend my lessons with the same assiduity that my brother James practises?" He thought it might appear cowardly; and this for awhile was triumphant over his better intentions. But still the infamy of Thomas Idle occurred to his mind. He said nothing, but sat

sat down to his book, and got a good lesson; and received the approbation of his master. His mother, who attentively watched the operations of his mind, observed the spark he had caught; and cherished and fanned it with the most maternal tenderness, that, once kindled, it might not be extinguished by some rude breath.

With satisfaction she perceived, after some time, the proper flame had been caught. Thomas became as industrious as he had before been inattentive. He not only studied the usual time, but even tasked himself to a larger portion, in order, he said, to make up for the time he had so wilfully mispent. Nay, he candidly owned, that he never knew

the pleasure of life before; for it cost him more time, and anxiety of mind, to accomplish his former pranks, and, if the expression may be allowed, to labour in idleness, than it did at present to study all his various lessons: that his mind was now at rest; whereas, before he had not one moment of tranquillity;—what with laying schemes, and an anxious dread of discovery, his mind was in continual agitation.

Besides, he began to feel a real pleasure from his books; the acquisition of knowledge afforded him a source of entertainment of which before he had not the least conception. But, the different manner he was treated by his own family, by his teachers, by his acquaintances,
and

and by all his neighbours, was so flattering to his feelings to whatever he had before experienced, that he acknowledged himself under continual obligation to the impression made upon his mind by the story of the Industrious and Idle Apprentices.

But if this story had such an effect upon Master Thomas Wilson, how ought it to operate upon those who have no dependance but industry and integrity for their support?—and that these two qualities united have been the support to many to obtain both wealth and honours, might be proved by examples in abundance, sufficient to stimulate any youth to obtain these high rewards.

wards *. A certain writer observes, that, "It would be amusing to trace the progress of a lord mayor from the loom, or the fishmonger's stall, to the chair of the magistrate:—to be informed with what difficulty he got the first hundred pounds; with how much less he had made it a

* "Sir James Saunderson was a living commentary of Hogarth's prints of the Industrious Apprentice. Born of obscure parents in the country, he came to town a raw country lad, but in his service so well approved himself to Mr. Judd, the hop-merchant, his master, as to procure his friendship and esteem, and even to gain the fair hand of his daughter in marriage. This event was the fore-runner of others still more propitious, until Saunderson arrived at the highest city honours, and was elected a member of the British Senate, and created a baronet of Great Britain." Monthly Mirror, July 1798.

thousand ;

thousand ; and with what ease he founded his *plum**. Such are, in the eye of reason, respectable characters ; and the more so, as they rose with credit from humble stations." Granger's Biog. Hist. vol. I. p. 149.

* One hundred thousand.

G O L D.



“PAPA, you promised to give us some account of gold.”

“I have not forgot my promise, and will attempt to fulfil it.—Gold is found with less alloy, that is, with less mixture of other substances than any other metal. It is found in some parts of Europe, in the Spanish West-Indies, on the coast of Africa, and at Chili and Peru in South America. From these two last places Europe is chiefly supplied; whence is brought to the two ports of Cadiz and Lisbon, according to the best accounts that could be obtained, about six millions sterling

sterling annually ; and of this, in the manufactories of Birmingham alone, incredible as it may appear, the quantity of gold and silver employed in gilding and plating, and thereby disqualified from ever afterwards appearing in the shape of those metals, is said to amount to fifty thousand pounds sterling yearly *.

“ Gold is found under a variety of forms ; in solid masses, in grains, under the shapes of branches of twigs or plants, in clusters of small particles united together, in the form of thin plates ; and what is procured from rivers is so small as to be named gold dust. It is also obtained from sand.

* Smith's Wealth of Nations.

“ Gold,

“ Gold, when pure, is the most valuable of all metals ; its colour is a bright yellow ; and it is the heaviest of all bodies, platina excepted. Gold also will stretch out to a greater length (called ductility), and by repeated strokes of the hammer be beaten thinner (called malleability), than any other of the metals. It is so ductile, that one grain may be stretched out so long as to cover more than sixty yards of silver wire ; and so malleable, that it may be beaten by a hammer into leaves so thin, that each grain of metal will produce a surface of almost sixty square inches ; and that so small a quantity of gold as sixteen ounces in weight, would be sufficient to gild
a wire

a wire equal in length to the whole circumference of the globe.

“I mentioned that gold is the most valuable metal that we have, but the art of man can render, by dint of labour, even iron to become of much greater value than gold: but iron shall be the subject of another discourse. Much more, indeed, might have been said about gold, but I have only mentioned some particulars of this metal.”

I R O N.



“IN the latter part of your account of gold, papa, you said that iron might be rendered of more value than gold. This seems very strange, since iron is so cheap, and gold so dear.”

“Iron, as it is the most useful, so it is the most plentiful of all the metals; and this circumstance, amongst many others, proves not only the great wisdom, but the goodness of that Being who formed the world, and all things therein. I said, one of the many proofs; for these are so abundant, that the more
minutely

minutely the stores of nature are searched into, and the ways of God to man are investigated, we find this great truth, wisdom united with goodness, always exemplified. To instance another proof, often overlooked, that such knowledge as is most useful to man, is the easiest acquired; what is of more difficult attainment, is the least wanted.

“ Iron is also the hardest of all metals; but this property, or, as it is termed its temper, may be increased or diminished by certain processes of art.

“ Iron* is found throughout the whole world, and often mixed with sand,

* “ The whole habitable world was originally covered with woods, till mankind
formed

sand, clay, or chalk. It is this body that gives colour to clays, the red rock, sand,—nay, it is said, to the

formed themselves into societies, and subdued them by fire and steel. Hence woods in uncultivated countries have grown and fallen through many ages, whence morasses of immense extent; and from these, as the more soluble parts were washed away first, were produced sea-salt, nitre, IRON, and variety of acids, which, combining with calcareous matter, were productive of many fossil bodies, as flint, sea-sand, selenite, with the precious stones, and perhaps the diamond.” Note to Botanic Garden.

“ Hence* dusky iron sleeps in dark abodes,
And ferny foliage nestles in the nodes;
Till with wide lungs the panting bellows blow,
And, wak’d by fire, the glitt’ring torrents flow:
Quick

* From the decomposition of vegetables: see the note,

vital fluid itself, blood.—We have three kinds of iron in Great Britain. Lancashire produces a great deal. The ore is very heavy and fibrous: it lies in veins like the ores of other metals. The bog ore is like a deep yellow ochry clay, in beds from twelve to twenty inches: its breadth of different varieties, but not large. The third sort, or iron stones, do not resemble metal. There are beds

Quick whirls the wheel; the pond'rous hammer falls;

Sound anvils ring amid the trembling walls;

Strokes follow strokes, the sparkling ingot shines;

Flows the red slag, the length'ning bar refines;

Cold waves, immers'd, the glowing mass congeal,

And turn to adamant the hissing steel."

Botanic Garden, canto II. p. 183.

of this kind of large extent, with seams of pit-coal lying in strata.

“ Iron ores must be calcined, that is, burned into a calx or kind of powder, before they are melted ; and which is done in large furnaces, from sixteen to twenty feet high, and from ten to fourteen wide. The shape of these large ovens is that of an hen’s egg, with the largest end undermost, below which is a square cistern to hold the melted metal. Near the bottom of the furnace is a hole for the insertion of the pipe of a large bellows, the piston of which is generally washed by water ; and the blast or current of air produced and thrown into the fire, makes a tremendous noise to those not in the habit of hearing it. Charcoal, mixed

mixed with brushwood, peat, or turf, are thrown into the furnace, intermixed with the ore, in small quantities, after the fire has begun. The quantity of fuel must be regulated, in order to obtain iron of good quality.

“Steel, from which the nicest instruments, as lancets, razors, pen-knives, and scissars are made, is iron that has undergone a certain process, which in many respects alters its nature. The best steel is by cementation from the best forged iron. By cementation is meant, that the iron is surrounded, in the crucible* wherein it is put, with charcoal and

* A vessel made of earth, and so tempered and baked, as to endure the greatest fire.

ashes mixed in a certain portion, well pulverized and mixed together. The bars of iron, which should be pure metal, are placed upright in the crucible, about one inch distance from the sides of the vessel and from each other. Thus prepared, the vessel is put into a furnace heated red-hot, and to remain about ten hours, when it becomes steel.

“ One of the most valuable qualities of steel is, that although sufficiently soft when hot to be formed into any shape, yet it may be rendered more or less hard by simply plunging the tool formed, when hot, into cold water. This is called tempering. The greatest degree of hardness is from a greater degree of coldness in the water, and hotness in the metal,

metal, at the time when plunged. Certain signs, which shew themselves on the surface of the metal, direct the artist how to temper it to such a degree of hardness as is wanted. Different colours are shewn at certain degrees of ignition, and which may be all exhibited at once on a clean bar of white steel, by placing one end in the fire, and keeping the other out:—these are, a yellowish white, a yellow, gold colour, purple, violet, and deep blue. Of course the blue colour produces the hardest steel; but by heating the metal again any sort of temper may be given.

“Steel may be rendered red-hot by compressing its pores by hammering; and it is the only metal
that

springs of the best watches are sold
 as high as half-a-guinea a-piece;
 and at this rate the pound avoirdupoise
 would amount to the enormous
 sum of thirty-six thousand seven
 hundred and fifty pounds sterling,
 and which makes the steel thus
 wrought into six hundred and thirty
 times more value than gold."

weight in gold. But in no one instance does this appear so great as in the spring of a watch pendulum, and which almost exceeds belief. This was put to the trial some time ago, at an artist's shop in London, upon such as are sold for half-a-crown a-piece for common work, when ten of them weighed but one single grain: hence one pound avoirdupois contains seven thousand grains, to weigh which requires ten times that number of springs, and which, at half-a-crown a-piece, amount to eight thousand seven hundred and fifty pounds sterling; whereas, the same weight of gold at four pounds per ounce, would only amount to fifty-eight pounds six shillings and seven pence. But the pendulum
springs

springs of the best watches are sold as high as half-a-guinea a-piece; and at this rate the pound avoirdupoise would amount to the enormous sum of thirty-six thousand seven hundred and fifty pounds sterling, and which makes the steel thus wrought into six hundred and thirty times more value than gold."

THE OLD TRAVELLERS..



MASTER Lofty had teased his mama so much to go to the fair, where he had been told were fine fights, and shows, and cakes, and fruit, that she at length consented; but not without putting him under the care of a trusty servant, with repeated cautions and directions.

Master Lofty, as eager as he was to undertake this jaunt of pleasure, came back very much out of humour. His mother soon perceived that he was not well; but that she charged to the account of fruit, or something improper, with which he

c

might

might have loaded his stomach. She carefully avoided making enquiries of the young gentleman himself, since it might only add to his chagrin, after a display of so much ardour for the jaunt and expectation of pleasure. She judged that more would come out by leaving to himself a detail, whenever he should be in the humour for talking over the events of the day, than if she seemed desirous to hear;—and so it proved.

After being seated some time, “I do not like these fairs,” muttered Master Lofty: “I was told there was fine doings, and fine things, and I do not know what. I saw nothing but hurry, and crowds, and dirt. Nobody noticed me. I was squeezed, and near being thrown down: indeed,

deed, I should have been thrown down, if John had not held me fast by my arm ; but no body minded me. Besides, the cakes were not so good as our own cakes at home ; no, nor their fruit. They were both so bad, that I am almost sick with what I did eat."

" These are small trials to what you will find as you advance in years," answered his mama ; " but these trials have their good effects. We could not know pleasure, without pain :—we should not be thankful for the blessings of health, without sickness. You would not have known the superior qualities of the cakes which Molly, our maid, makes, but by tasting those at the fair : nor would you have known the comforts

of home, unless you had tried the bustle of the fair. But you must learn, after all, to accommodate yourself to these difficulties; you must expect them,—you must submit to them. You are yet a child, a spoiled child, as it is called:—you must very soon go to school, which is not only a place for the education of youth in different kinds of learning, but a school is a little world, which prepares you to act with more firmness when you appear in the great world. In a school, if you shew any little fretful airs, your schoolmates will correct you more effectually than your masters. You will there, in some degree, learn to subdue your passions, improve your manners, endure some hardships, and
prepare

prepare you the better to meet those buffets, which you will certainly find when you arrive at manhood, and have dealings in the world.

“ But there are spoiled men, as well as spoiled children. I mean such as are retired from the bustle of life, having a competence. They have nothing to do but to enjoy the many comforts given to man, without the difficulty of combating the evils. Yet, even this state makes them mere children; and if they appear upon the stage of life to mix with company, are not only fretful, but even ridiculous. And this state I will endeavour to illustrate to you by a story, and which may be a sequel to that of the Young Traveller, as this is of the Old Travellers.

“ Mr. Testy, Mr. Johnson, and Mr. Simpson, had long intended a journey. This they had talked over and over whilst smoking their pipes and sipping their evening’s glass, as it was their daily custom. After a long repose, they would once more see the world by taking a journey, purely to enjoy pleasure, as not one of the three had the least business upon his mind; therefore, the aspect seemed as promising to ensure success to their intentions as could be conceived.

“ Mr. Testy, though not the most proper, yet being the eldest person, was appointed the captain of the company. Each having contributed his share towards defraying the expence of the journey, the stock was
put

put into the hands of Mr. Testy, as paymaster. The morning arrived, and they all three entered the carriage; not, indeed, with the ardour of our young traveller, but with high expectations; and to which a fine day, and the fragrant scents which arose from the opening buds, the effects of spring, not a little contributed.

“All went well till the end of the first stage, when fourteen-pence per mile being demanded for the chaise, the countenance of Mr. Testy became ruffled. He not only blamed the taxes, but those who caused the taxes. He appealed to the postmaster, whether as good accommodation could not have been had formerly for nine-pence, nay, even for sixpence

fixpence a mile. The postmaster bowed assent: but yet these solid truths produced no other effect than delay. The demand must be paid, however strongly contested by words, or contrasted by former prices. A shilling being offered to the post-boy, he indignantly refused to accept it; and whilst seating themselves in their carriage, amongst many harsh words and wishes of their last driver, he added another wish, that the travellers might be overturned and break their necks. During this, the ostler put in his claim, with hoping their honours would not forget poor ostler. This new claimant, with the language of the post-boy, had wrought up the passions of our veteran into perfect rage. Mr. Johnson, to pro-
duce

duce peace, threw a couple of shillings, which appeased the wrath of their last driver; and with a nod to the present one, who was seated on his horse, and took the hint, they drove off.

“It was a long while before the features of Mr. Testy could relax, and soften down to any degree of serenity. Conceiving no good-will towards the travellers, from the tone of voice and trait of conduct noticed, the master of the inn had ordered two of his worst hacks to convey his guests. A sulky post-boy had caught the infection of his brother whip, and his temper of mind was seen by the frequent application of the lash. This harsh music, and the gloomy features of Mr. Testy, caused

caused no pleasant sensations to the second stage.

“Nor was dinner a cure. The fish was but so so; the mutton was not the right sort; the peas were ill boiled:—but these things were nothing to the wine, charged three and sixpence per bottle in the bill. Although no stranger to the price, yet taxes, and the ministers who laid on such imposts, were again called in question; “For,” says he, “I have known wine in my time only half the price, and double in quantity! Look here at the bottle? Why, in my younger days we should have kicked such a flask out of the room.” The wine, which should have done away the vapour, had only increased the flame. Hope yet remained

remained that a night's repose, and the morning breeze would bring balm along with its gale, and heal the troubled spirit.

“ It had been agreed that after the morning's repast, and the barber's aid, they should take a walk through the town, and view what was curious ; but Mr. Tefty, after breakfast, was not to be found. The whole forenoon was spent in waiting his return. Without any apology for the suspense in which he had kept his companions, he told them he was not such a fool as to give sixpence, a sum always expected by the barber who attended the inn ; that he had been in search of one that shaved for a penny ; after which he had looked out for a walking stick,

stick, for which he had paid sixpence, and really believed it not worth half the money :—but amongst these several savings, time was spent.

“ They set out to view the spacious mansion of Lord ——, where, when they arrived, they were told that that was not a public day, and that therefore they could not see the house. “ What ! keep a house to be seen, and not shew it ? ” exclaims Mr. Testy : “ and we have travelled fifty miles, and that as it seems only to be disappointed ! Was ever such a thing heard of in a free country ? ” During this, the servant who held the door was near closing it upon the strangers ; but Mr. Johnson, bowing, requested, that as they were strangers, and ignorant
what

what day in the week was set apart for the accommodation of the public, begged that he (the servant) would represent their situation to his lordship, and if not very inconvenient to the family, he would break through the general rule by granting this indulgence. This argument was enforced by slipping a half-crown into the servant's hand.

"The servant returned, and admission was obtained.—If any thing could have soothed Mr. Testy's temperament, one would have supposed this act of civility might, since it was very evident that the family was incommoded by this indulgence. No such thing;—his thanks at departure were in the following strain :—" So ! I suppose you expect money for the

H exhi-

exhibition of your show-shop? A pretty trade for your master! An easy way of paying servants' wages!"

"They fell in with a stage-coach setting out, and through their intended rout; but what was that to the purpose, since this part was through a country containing the most interesting objects and scenes, which they intended to view with great attention, and at their leisure? and how was this to be atchieved through the medium of a stage-coach? But Mr. Testy urged the great saving by this mode; nay, would take them to the end of their journey without further trouble or vexation. These last words operated like a charm upon the ears of his two companions; for as they had
already

already experienced enough, any thing might be sacrificed to avoid a repetition.

“ In this vehicle things went on pretty well, saving one dispute with a passenger in the coach, who differed in sentiments from Mr. Testy, and this caused a few words, since, whatever the subject, Mr. Testy was always in the right. But dinner proved the upshot and end of their intended journey of pleasure, and which will be best explained by repeating the dialogue that ensued.

“ TESTY. Is this the whole that is intended for our dinner? a shoulder of mutton and green peas!

“ WAITER. All that we have ready dressed to-day, sir.

“TESTY. Do you never provide better?

“WAITER. Very frequently, sir.

“TESTY. Why not to-day then?

“WAITER. Of late, but few travellers have arrived, and provision has been made in proportion to the number expected.

“TESTY. Do you suppose that I shall sit down to such a dinner?

“WAITER. I don't know, sir.

“TESTY. Don't know! Send your master.

“The hostess enters, broiling from the kitchen fire; her figure not the most delicate, nor her dress in the highest taste.

“HOSTESS. Who wants me?

“TESTY. You! who are you?

“HOSTESS.

"HOSTESS. The mistress of the house.

"TESTY. I want the master.

"HOSTESS. I am—both master and mistress.

"TESTY. Oh! oh! Pray do you expect that I shall sit down to such a dinner as this?

"HOSTESS. How should I know that? but if you do not choose to sit, you may stand.

"TESTY. I say, I don't like the dinner here provided.

"HOSTESS. I cannot help that.

"TESTY. But cannot you provide a better?

"HOSTESS. Yes, if I please, and you will wait.

“TESTY. I do please then, but cannot wait. Is not the coach going off?

“HOSTESS. Therefore I must perform a thing impossible, to please your filly fancy.

“TESTY. You are an impertinent woman.

“HOSTESS. Me, pertinent woman!—I’ll teach you to call names in my own house!—Me, pertinent!” snatching up the smoking shoulder from the dish, and applying it first to one cheek, then to the other, in such rapid strokes, that poor Testy both roared and retreated; whilst the hostess bawled out, and repeated her blows, till she drove him out of doors into the street.

“After

“ After this exploit, the hostess in a short time entered the room, and made an apology to her guests for the loss of their dinner, which, however, she promised to make up in the best manner she was able; adding, that it was not the first time that she had applied a similar plaister to saucy travellers; and who, through ignorance or pride, could so far forget themselves, as to ask for impossibilities, and undervalue her best services. “ I beg pardon, gentlemen, for keeping you without your dinner;” and away she went.

“ After Mr. Johnson and Mr. Simpson had composed their muscles (for who could forbear laughter) they went in search for their degraded companion, whom, after
some

some time, they found in a state that is not easy to describe. It was difficult to say whether indignation or shame was predominant in his countenance. When words found utterance at last, the first phrase was, "Let us return home. The world is turned topsy-turvy, and every body gone mad. What will things come to at last? Come, let us return;—there is no comfort any where but at home."

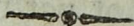
"I have selected this story, and which is really founded on facts, to shew you how unhappy, nay, how ridiculous, a person may render himself, who yields to his passions or his humours, unless he submits to the common forms of civility. And I wish to enforce this more particularly

larly

larly to your notice, since in a very short time you will have difficulties to surmount, of which, at present, you cannot have the least conception. If your companions perceive your weak side, as it is termed, or any thing that particularly irritates or offends you, they will on that very account tease you the more, the more it ruffles your temper; and instead of having John to prevent you falling into the dirt, there will be found many ready enough to kick you into it, that they may enjoy a laugh at your expence. I do not mean that you should not shew a proper spirit when improperly treated; but this will seldom be the case, if, after having conquered your childish propensities, you

you maintain a firmness of conduct. Whatever other good qualities a man be endued with, he never will acquire the character of a great man, without firmness of mind, resolution to overcome difficulties, and perseverance to obtain that point which was the object of pursuit. These qualities, joined to industry, integrity, and sobriety, will remove mountains, and gain that respect with equals and superiors, which cannot be obtained but by such like purchase."

C O A L.



"YONDER is a man almost as black and dirty as the chimney-sweep: is there any business so dirty as that?"

"The man you enquire after is very useful, and procures us what we could but ill do without,—fire, to keep ourselves warm, and to cook our victuals. He is one of those who dig coal, and is, therefore, called a collier."

"Dig coal! how is that? Tell me something about coal?"

"Coal is a substance found underground, often a great depth below the surface. It is supposed to have changed

changed from some other substance, as peat or turf, or timber: nay, coal has been found where a part adhering has not yet been converted into coal, but was, in its original state, timber*.”

“ Does stone undergo a change?”

“ Yes. Stone, and almost every thing in nature, has undergone a change. Different stones have been formed of different substances. Look

* “ In some coal the fusion of the strata of coal has been so light, that there remains the appearance of ligneous fibres, and impressions of leaves.”

“ In other circumstances, morasses seem to have undergone fermentation; from the great heat produced, the oily part becomes distilled, and rising into higher strata, becomes again condensed, forming coal beds.” Notes to Botanic Garden.

at that marble chimney-piece:—
do not you observe the shape of
many shells? A heap of these, by
some process of nature, have grown
hard, and become what we call
marble, capable of receiving a fine
polish, but still retaining within its
mass a variety of colours, and molds,
and shapes, from those substances
from which it had its origin. In
some marbles the solution has been
complete, and no vestiges of shell
appear, as in the white kind, called
statuary marble *.”

“ In

• “ Gnomes! you then bade dissolving shells
distil

From the loose summits of each shatter'd hill,
To each fine pore and dark interstice flow,
And fill with liquid chalk the mass below;

8

Whence

“ In what does coal differ from stone ? ”

“ Coal is combustible, that is, it can very quickly receive the fluid matter called heat, or caloric, by which the coal is reduced to ashes, and during this process gives out both warmth and light, by which we are so often cheered during the winter season, when seated round the grate whilst the coal is blazing, and yielding that which lay dormant when in a cold state, and before this matter, which puts the other in mo-

Whence sparry forms in dusky cavern gleam
With borrow'd light, and twice refract the beam;
While in white beds, congealing rocks beneath
Court the nice chissel, and desire to breathe.”

Botanic Garden, canto II. line 93.

tion,

tion, and is greedily taken in, was communicated."

"You speak as if heat or warmth was a substance or matter; but we cannot see it, can we?"

"No, we cannot see that substance which causes the needle to point towards the north. We do not perceive the air we breathe, and yet we know it is a substance, which may be weighed, compressed, &c.*

"It is but lately that fire has been considered as a body; but it is difficult to comprehend its effects without admitting a real and material substance, or subtile fluid, which insinuates itself between the particles of bodies."

* A cubic foot of atmospheric air weighs about one ounce.

“Where is coal found?”

“In the bowels of the earth, but not every where, according to Hutchinſon*.

‘The ſtrata of coal ſeem to lie in
‘a very ſmall compaſs on the globe.
‘I have met (ſays he) with an ob-
‘ſervation, that if a line be drawn
‘from the mouth of the Severn to
‘Newcaſtle, and ſo round the earth,
‘that all the coal will be found to
‘lie within a very ſmall diſtance of
‘it on one ſide or the other. The
‘coal found in Europe, at leaſt, is
‘about Liege, and weſtward in the
‘mountains of Kilkenny in Ireland;
‘both within two hundred and fifty
‘miles of it. But I think there is

* Hiſtory of Cumberland, vol. II. p. 64.

‘no occasion to stretch the line
‘round the world; for all the coal
‘we know of lies within the latitude
‘of our own island.’

“I should be almost afraid that coal would all be wrought up, if it lie in so small a compass, and then what could we do without it? The loss would be so grievous, that I almost shudder with cold from fear!”

“You may make yourself easy on that head, that coal will last your life and much longer; but if sending coal out of the kingdom be permitted, a term will certainly arrive when the present beds will be exhausted, although very extensive. In the two counties of Cumberland and Northumberland there are about two hundred square miles, which

1 3

contain

contain coal proper for exportation, and of this more than one hundred and fifty acres are cleared every year; therefore, the coals, according to this statement, will last about eight hundred years: but if the bed should fall short in the thickness of six yards, upon which this calculation has been made, then the coals may be exhausted in less time; and it is thought the aggregate thickness of the seams is more likely to prove three yards than six."

"But you say that coal grows out of other substances:—there may be some in its infancy not yet coal, but growing into coal."

"I cannot say that is not so, and such a thing is most devoutly to be wished; or else, beside the loss of
warmth

warmth in our rooms, and fire to dress our food, many of our manufactories must fail, as they depend upon coal for their support."

"Does coal lie very deep in the earth?"

"So deep are the mines that are now wrought, that fifty years ago it would have been impossible; since all mines require to be cleared of their water, and which, at that period, could not have been fetched up by any engine then in use. By the power of steam, engines have been so constructed, as to effect what would once have been thought impossible.

"There are pits almost three hundred yards deep, down which both men and women, boys and girls,

girls, descend, to work at or get the coal which grows so much beneath the surface of the earth. The work is very laborious, and in total darkness, except the glimmering of a small candle, or the sparks from a flint; for the air in some mines is in such a state, that it would take fire from the flame of a candle, and certain loss of life would ensue. Nay, with all their care and cautions, many accidents happen through this cause, and there are many others to which these people are liable; for, besides being deprived of the light and the cheering rays of the sun, they are under the necessity of working almost naked, covered with dirt, surrounded with water, in a situation that will not
always

always admit them to stand upright, and in frequent danger of their lives*. Dreary, dangerous, and void of

* “ With what dangers and hardships do the poor colliers ransack the bowels of the earth to get this black mineral! How little preferable is their lot to that of the Spanish felons, who work the golden mines! They take their leave of the sun’s light, and, suspended by a rope, are let down many fathoms perpendicularly. They traverse the rocks through which they have dug their horizontal ways. The murderer’s cell is a palace in comparison with the black and dreary spot to which they repair.

“ Form, if you can, an idea of the misery of men kneeling, stooping, or lying on one side, to toil all day in a confined place, where a child can hardly stand; whilst a younger company, with their hands and feet on dusty ground, and a chain about their bodies, creep and drag along, like four-footed beasts, heavy loads

of comfort as this kind of life may appear, yet there are not a set of

loads of dirty mineral, through ways almost impassable to the curious observer. In these low and dreary vaults all the elements seem combined against them. Destructive damp, and clouds of noxious dust, infect the air they breathe. Sometimes water incessantly distils on their naked bodies, or bursting upon them in streams, destroys them, and deluges their work. At other times pieces of detached rocks crush them to death; or the earth breaking in on them, buries them alive. And frequently sulphureous vapours, kindled in an instant by the light of their candles, form subterraneous thunder and lightning. What a dreadful phenomena! How intolerable the noisome smell! How dreadful the continued roar! How violent and fatal the explosion!" Ferrar's Tour from Dublin to London: scene at Colebrook.

What degree of comparison does this bear to the work of slaves in the West-Indies?

mortals

mortals apparently more cheerful. They amuse themselves with singing or whistling through the whole day, and return to their labours with alacrity. You perceive what wisdom is displayed through all the works of God. To his several creatures he has given a variety of tempers, likes and dislikes; and yet all tending to the general good and welfare of the whole. It is this which tempts one to ascend the giddy mast, in the hour of darkness, and in the midst of danger, to bring you many of the comforts of life from distant countries;—which impels another to descend into the bowels of the earth, in the continual hazard of meeting a sudden death, with a scanty and cold meal, to procure

cure that substance by which you may obtain a warm meal and a warm room."

"Indeed, master collier, I am more obliged to you than I could have thought from your dirty looks; nor can I ever look upon a coal fire again without a grateful heart."

THE HORSE.



MASTER Wilson had behaved himself so well, and given so much satisfaction to his masters by application to his books, and the great progress made in various branches of learning, that his father wished to shew his approbation of this good conduct, and proposed to buy his son a little horse. Master Wilson was in raptures with the thought that he should have a horse that he might call his own, and longed for the day when this wish of his heart should be gratified. In the mean time a little horse was looked for, mild, cool,

cool, and temperate, and in every respect such an one as those not experienced in the management of a horse might venture to ride. A little horse was, after some search, fixed upon; and the following day Master Wilson was to take his first airing on horseback, in the company of his father, and along with a servant.

The horse afforded a subject for the conversation of the evening, for as Master Wilson could think of little else than his horse, so his conversation still wandered towards the same subject. Mr. Wilson took this opportunity for giving some hints of the proper conduct which it was prudent to observe towards these useful beasts; "For," says Mr. Wilson,

Wilson, “ besides the utility, there is not one of the brute creation that contributes more to the pleasure of man. Few animals are more sagacious or more faithful; and yet, with all these valuable propensities, they are often greatly abused and ill treated by masters whom they have faithfully served.

“ I expect that in due time you will become a good horseman, and excel in that as well as in whatever you undertake. Horsemanship, like every thing else, requires practice,—skill, as well as instruction, to become expert; and for this purpose there are schools with masters to teach how to ride, as well as schools with masters to teach how to read, write, &c.

“Above all things, I would recommend you never to quarrel, or put yourself into a passion with your horse, or make use of violence in whipping or spurring it. It is true, that if once you submit to be conquered, but that generally proceeds from timidity or rashness, your horse will from that moment, not submit himself to your wishes. Young horses, whilst in training, must sometimes feel the lash, but that by a man of skill in his profession, and is only applied on certain occasions, and therefore requires great judgment.

“The breaking in, or training a young horse, to the use intended, is effected more by art, than by strength; for the strength of man
compared

compared with the strength of a horse, is like dust in the balance. The young creature is first bound in such manner, and put under such situations, that his efforts to resist are in vain. After this lesson, he is caressed and cheered by his tutor, and thus, step by step, is shewn what he ought to perform, and his tractability is cherished by kind words and actions; but when he resists, stratagem or the whip is applied to enforce obedience.

“ These kind of teachers have a proverb, or saying, that the horse looks upon man through a magnifying medium, and that a man appears to a horse much larger in size than he in reality is; else his superior

strength would never submit to the feeble powers of man.

“ Be that as it may, for it is only a saying. That Being who created man and beast, gave to the former powers, “ to subdue and rule over the fish of the sea, the fowls of the air, and over every beast that moveth on the earth.” But this power should not be wantonly used, not only from motives of humanity, but many others equally strong, of which I know of none stronger than that of reciprocal kindness.

“ The horse knows his master as well as the master knows his horse. He can distinguish him by the tone of his voice, and the sound of his foot. If well treated, he is grateful ;
and

and this gratitude is manifested under a variety of forms. I can speak from repeated experience that my life has been in the power of my horse more than once, and his conduct has been that of a most faithful servant; nay, even of the kindest friend. How many times has it been known that the horse has brought the bewildered traveller in safety to his own home, in the hours of darkness, through storms and other dangers. His memory is so strong, that he can remember every turning and winding of a road, however intricate, through a long series of years, and which has vanished from the memory of his master: and probably he may take as much pleasure and pride under his load,

as he who bestrides his beast, and
thus verify the lines of the poet,

The bounding steed you pompously bestride,
Shares with his lord the pleasure and the pride.

Essay on Man.

“ I knew a horse, a most beautiful creature, high mettled, and of high blood, whose master was grown infirm and almost helpless; and although he kept his carriage, was fond of an airing on horseback, having been an excellent sportsman in his youth. This beast, as if he knew his master's infirmities, would come close to the steps on which he ascended, look round to see how he might accommodate him, and put his body into the very posture that best suited; nor would he stir a foot
till

till after his master was seated, which took up some time, when, on the motion given, he would begin his playful frolics in a style that he knew would please without incommoding his rider. This instance is a strong proof of the pleasure he may enjoy in the performance of his task*.

“ I will

* Talking upon this subject since writing the above, a gentleman mentioned that he once had a horse which was so attached to him, that if left in the street, he would wait for him at the door, and violence would scarcely have driven him away; and that once, being thirsty, the horse went to drink, returned past his own stable, and took up his former station in waiting for his master. The gentleman was infirm, and if he wanted to mount on the road, he had no more to do than let the horse seek a situation, and when he had found a proper place, would fix himself, and there stand still, till his master had mounted.

Another

“ I will give another instance.
Horses accustomed to the chase

Another example of attachment betwixt the horse and his rider. The late celebrated Mr. Princeps, famous for his breed of cattle, had a favourite horse, and which he would never permit any one to mount but himself. After the horse, through age and infirmities, became past labour, he was consigned to a paddock, there to end his days. During the last illness of Mr. Princeps, the horse broke through the fence repeatedly, that he might approach the dwelling of his sick master. Breaking a fence was an unknown practice of the horse previous to this; and, moreover, the fence round the paddock was remarkably strong. The fact being told to Mr. Princeps, “ Aye,” says he, “ *Jack* (the name of the horse) will not long survive his old master.” The horse was found drowned in a brook which ran close by the church-yard, and adjoining the spot where the remains of his old master had been deposited the preceding evening.

grow

grow fond of it, although no exercise to which they are put is more laborious during the pursuit, going at full speed, often over bogs or soft ground, and every now and then making violent exertions to leap over fences; yet horses have been known to follow the hounds for their own pleasure, even without a rider. I was told the following story by an old sportsman. Having purchased a horse at market, and after having paid the money, he asked the last owner if the horse had any particular fault, to tell him now, that he might be on his guard. He answered, that the fault he was sold for, was, that whenever he heard the hounds, whoever might be on his back, he would join the pack

pack and pursue the hunt; otherwise a good horse. "The greatest recommendation to me," replied the purchaser, "you could have given him; and I would have paid fifty pounds more for the beast on knowing this, had it been required, rather than missed my bargain." The gentleman added, he was the best hunter he ever crossed.

"Against these facts, instances have been known of horses dashing out the brains or maiming of such masters, when opportunities have offered, who have rendered themselves obnoxious to these animals by their cruelties. A gentleman was witness to the following scene:—A person being thrown from his horse, the beast, after he recovered himself,

self,

self, immediately advanced to the rider, and made a kick at him, which was very near dashing him to pieces. It being in a public place, the person was immediately surrounded by people. When the horse turned his head, and saw that his intended victim had escaped the stroke, he made another effort with open mouth, as if to tear him to pieces, and was with great difficulty restrained. Nay, after being secured, he continued to manifest threats and vengeance against him who had treated him unkindly; for he was known to be a cruel master, yielding to passion, which broke out into outrageous conduct. It is true there are different tempers and dispositions amongst brutes as well as amongst

L

men.

men. A horse that is known to have a temper naturally vicious and incurable, should never be crossed, but turned to some other use. There are a variety of employments for horses of different descriptions, as the racer, the hunter, the road-horse, the common carter; the make and fashion of which vary greatly, according to their several occupations.

“ The race-horse has a fine bone, and strong muscle; he moves with amazing speed, in general about a mile in two minutes. A horse called Childers, the swiftest ever known, could move eighty-two feet and a half in a second, or nearly a mile in one minute.

“ The most extraordinary instance in trotting was by a horse in London
in

in 1788. This horse, for a wager, trotted thirty miles in an hour and twenty minutes, ten minutes under the time allowed.

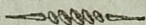
“ The hunter is a mixture of the race-horse with others of superior strength.—The cart-horse is of still stronger bone, with a heavy form and slower motion.

“ If you are not already tired, I will mention one more trait in the horse, and which exhibits strong marks of high spirit, with a sense of honour. Till of late years, pack-horses were employed to carry such articles as are now conveyed in carts or waggons, from one part of the kingdom to the other, the roads then not being passable for wheel-carriages. In their long journies, a

leader was selected out of the gang, such an one as shewed signs of superior sagacity and steadiness. This leading horse was furnished with bells, which, by their sound, gave notice to the rest, who followed, and strictly adhered to the line and order which custom had taught them to observe; but if ever the leader was deprived of his post of honour, and put into the rank, he pined after his former station so much that it was never thought prudent to keep him in the same gang. Nay, we are told that “one of these horses that had been used to *follow* his leader, by accident or fatigue was thrown into an inferior rank. The poor animal, as if sensible of his disgrace, by the most strenuous exertions at length recovered

vered his usual station, which he maintained during the remainder of the journey; but, on his arrival at the inn-yard he dropped down dead on the spot, his life falling a sacrifice to his ambition. A species of heroism we must admire in the brute creation." Bewick's History of Quadrupedes.

THE LETTER.



“PAPA! I have received a letter from my brother! You cannot think how well pleased I am that my brother should write to me! I never received a letter before!”

“Can you read your letter?”

“Yes, papa. I have read it over and over! and have kissed it many times! Oh dear! I am so pleased!”

“Tell me what are the contents of your letter?”

“That my brother is very well; and that he will be at home in a fortnight; and that he will bring some of his drawings, which he
thinks

thinks will please both papa and mama."

"And is not this wonderful, that all this pleasant information should be conveyed to you on a piece of paper, by a few strokes with a pen?"

"Why, yes; but we can write any thing, you know."

"It is true, we can write any thing, or convey any information to distant parts, as clearly and distinctly as if we were present, and could hold a conversation; and our thoughts being thus committed to paper, are under the name of a letter, which, by the speedy conveyance lately made in the post, is carried to its place of destination with a celerity and a security that would have appeared incredible to our ancestors."

"It

“ It is indeed more curious than I ever thought of. I could never have found out such a method. Pray who did invent this ingenious way ?”

“ That is more than I can say ; for it seems rather the gift of Divinity than the invention of man, that by these easy means we can enjoy the sentiments, the discoveries, the grand conceptions of illustrious men, who have been a long while dead, and which, but for this, must have perished with their authors. To recount all the benefits we enjoy in consequence of this art is as impossible as it is by what means or by whom it was discovered. But it is one of those blessings we enjoy, which, like to many others, being
familiar

familiar with, and long habituated to, we are very apt to overlook.

“ Nothing, it seems, is more incomprehensible to the untaught savages than the art of writing. That messages and information of any kind can be conveyed by the strokes of a pen, in such figures as the forms of letters, is beyond their comprehension. Some laughable stories have been told at their expence, such as, that whilst conveying a letter, and wishing to commit some action that required secrecy, they have put the letter out of sight, that it might not see, nor betray by its magic power, their transgression. But even the action of hiding the letter is a strong proof how highly puzzling

puzzling it is to them to comprehend the meaning of conveying thought by letters. I met lately with some pretty lines on this subject, and which I will repeat to you :—

ON PRINTING.

Hail, MYSTIC ART ! which men, like angels,
taught

To speak to eyes, and paint embodied thought :
The deaf and dumb, blest skill ! reviv'd by thee ;
We make one sense perform the task of three ;
We see, we hear, we touch, the head and heart,
And take, or give, what each but yields in part :
With the hard laws of distance we dispense,
And, without sound, apart, commune in sense ;
View the confin'd, nay, rule, this earthly ball,
And travel o'er the wild expanded all.

Dead letters thus with living notions fraught,
Prove to the soul the telescope of thought ;
To mortal life immortal honour give,
And bid all deeds and titles last and live.

In

In scanty life ETERNITY we taste;
View the first ages, and inform the last;
Arts, history, *laws*, we purchase with a look;
And keep, like FATE, all nature in a book.

By Mrs. Constantia Grierson.

THE QUAKER.



“MAMA! what an ill-bred man that was, who has been here! I never saw any person behave so rude! I wonder that you did not speak to him on that account! I expected that you would.”

“What you call rudeness, is only a peculiar way. The man is one of the people called Quakers, a religious sect, and who, with peculiar notions, have peculiar manners.”

“That may be;—but to come into the very room, sit down, and talk with you, without ever removing his hat, was a degree of ill-breeding

breeding that I should not have thought any body would have been guilty of*.”

“ I told you these people had peculiar manners, and this is one. It is true, men are in the habit, by way of courtesy, of uncovering their heads ; and they moreover study how to do this according to the fashion in vogue, and which requires both pains and practice to effect gracefully. But after all it is but a custom with us ; and it may be that

* A Quaker being reproved for not removing his hat upon entering a room, keenly replied, “ Since thou payest so much attention to thy room, why didst not thou remove thy shoes from thy feet, since thy shoes will more injure this foot-cloth, than my hat, which is upon my head, any part of thy furniture.”

in some countries to pull off the upper garment, as the coat or toga, or the lowest one, as the shoes or sandals, may be their way of shewing respect. But we, whose eyes are not accustomed to such habits, should probably be as much struck with this novel manner of shewing respect, as you were at the Quaker's not discomposing any part of his dress."

"Well, but his rudeness of speech in saying *thee*, and *thou*, to *you*! I do think if he had even spoke to *me* in that way, I could not have borne it patiently."

"It is very well then that he did not address himself to you, else you might have exposed yourself by being guilty of a rudeness of conduct of which the Quaker was perfectly innocent ;

innocent ; and I am not sorry that this meeting has happened, which may be a means of preserving you from the ill-breeding and incivility of which you have, without knowing better, accused this stranger.

“ It is true that we only make use of the words *thee* and *thou* to those in inferior stations, whilst we address ourselves to equals or superiors in the plural of those words by the terms of *ye* or *you* ; but this is deviating from the simplicity and propriety of language, and only a modern refinement of speech. *Thee* and *thou* are the language of scripture ; nay, the form of language in which we address our Maker, “ Hallowed be *thy* name ; ” &c. You see, therefore, how great would

have

have been your weakness, had you shewn signs of anger at this address."

"But why did not you say *thee* and *thou* to him, then, since you can find so much to say in favour of those terms?"

"For the same reason that it is the custom of others to address these people in the usual terms of speech. Indeed, I have sometimes heard persons reply to them in their way, or in what is vulgarly called *tit for tat*, as *thee* for *thou*; but those were always vulgar people who made use of this style, and who either shewed their pride of heart, irritability of temper, or ignorance of the world; for where no offence is intended, no offence should be taken; and the very essence of polished manners and
good

good breeding, is to avoid giving an affront."

"But the man's dress, and prim looks, were as singular as any thing else. I have heard you say, that people, of all things, should avoid singularity of dress."

"And so they should: but these are a body of people, who so far from being singular, never alter their mode in the cut of their coat or change of its colour. The fashion is now or nearly the same as it was a century ago, whilst our's has been varied into shapes and figures, and coloured, and party-coloured, so much, that a beau of the last century, nay, of the last half score years, would be a *fear-crow* in a modish assembly of the present day. Whereas,

the Quaker's dress has a sameness, and is always in fashion;—neat, simple, plain, and always clean, and of materials good in their kind. This mode of dressing, with their frugal way of living, which is of a part with their dress, plain dishes, and those but few in number, but enough in quantity, with drinks to quench their thirst, not to enflame their blood, supply the calls of nature. By such prudent steps, what others waste in vanity, these hoard up through forbearance; by which means they are enabled to procure every necessary comfort when sickness or age arrives, and when they stand so much in need of them. Nay, they withhold it not from their indigent brethren, members of their society,

society, who are provided for out of the funds of their friends, without burthening that public, which, by law, is bound to provide for them. In short, the people of this society are in general good subjects, good neighbours, and good christians. Their general good conduct, their inoffensive deportment, and their conscientious discharge of the duties of private life, entitle them to the goodwill of mankind. I therefore pray you, never laugh at, or think worse of the manners of the Quakers.”

A STRIKING EXAMPLE

OF

ANGER, REVENGE, FEAR, JUSTICE, HO-
 NOUR, and HEROISM, exemplified in
 the following Story.



“ FIRMEN DA COSTA, a Portuguese negro and slave, during a public spectacle, after being repeatedly desired to keep within the proper bounds, was slightly wounded by a soldier with his bayonet. The slave, enraged to be thus, in his opinion, insulted, with bitter oaths declared, that only the want of a weapon prevented him laying the soldier dead on the spot. He retired full of wrath and breathing revenge.

“ He

“ He found by inquiries the regiment, the company, and the name of the man, who, in the discharge of his duty, had given this mortal offence. A few evenings after he decoyed his victim, by a pretended message, to a retired spot, near his master’s house, and stabbed him to the heart. His savage nature not yet being satisfied with murder, he inflicted deep wounds on various parts of the soldier’s body, whispered to the dying man who he was, mentioned the affront he had received as his reason for this bloody action, and that he was now satisfied. He then quitted his station, and fled for safety into the woods.

“ The spot on which the body was found, the mark on the instrument

ment of death, which lay on the ground, and the circumstance of the master of the murderer being the last person who was seen speaking with the soldier, strongly marked him as the object of guilt. In vain did the merchant plead his innocence. He pointed out the flight of one of his slaves as presumptive evidence of the fugitive's guilt. He was, however, committed to prison; and on this circumstantial evidence he was condemned to die.

“ This event reached the ears of the real murderer in his retreat ; and he who, rather than submit to a trifling injury, had, with a savage barbarity, spilled the blood of a fellow creature, could not bare the self accusation of ingratitude and injustice towards a
 master,

master, from whom he had long experienced gentle usage, even to indulgence. He yielded to the impulse of the heart, cast himself before the seat of justice, and confessed himself the murderer of the soldier.

“ The judges paused.—How could the same man exhibit such an instance of heroic virtue, after being guilty of such a savage and blood-thirsty deed?—He was committed to prison.—The sensations of emotion in the breast of the master, from this event, are not easy to describe. Although acquitted of the foul accusation, and unexpectedly rescued from an ignominious death, yet these joys were embittered by reflecting on the guilt of his slave. The most faithful,

faithful, the most affectionate of his servants, attached to him by long servitude, and of tried integrity, was not less than an atrocious murderer. He endeavoured by every means in his power to save the culprit's life:—all intercession was in vain. With more appearance of joy than sorrow the negro was led to execution.—It is recorded, that Emanuel Cabral, Da Costa's master, would have freely parted with half of his estate to have saved the offender's life.

“ I have selected the above story, my dear child,” said Mrs. Lofty, “ for your use, and which I trust may produce some good effect on your very irritable temper. You are at present collected, and have recovered your reason; but I almost shudder

shudder at your expressions to John this morning, when in the discharge of his duty, and restraining you from committing what, if done, you might have long repented. Nay, if you could, at the same time have made good your threats upon John, in the rage of passion, your peace of mind might have been destroyed for ever.

“ Your spirit has never yet been properly checked. It has been called manly; and you have gone from step to step in yielding to its influence so much, that now I begin to dread the consequence. With all this furor, your heart is tender, kind, even affectionate. These amiable qualities would render your compunction of mind more severe, if, in yielding to your passions, you should

at any time be guilty of any rash action.

“ Consider the advantages you enjoy more than this untutored savage, who was a child of nature, and so far from having lessons to conquer these habits, it might have been one of the maxims inculcated by his parents to encourage him into acts of revenge; as these precepts, with the few that are given, are very strongly urged amongst the savage tribes. Yet even acting under this parental precept, Firmien felt remorse of conscience, when he had involved a kind master into difficulties by this horrid deed.

“ Granted that you never should shed blood, as God forbid! yet if you do not subdue these propensities,
you

you may frequently embroil yourself in quarrels, and which may end in duels. And if you could at any time perceive your own distorted face in these tumults of the mind, you would scarcely believe the features were your own, but more likely those of some fiend. You plead in excuse that you cannot conquer these fallies. Have you ever fairly made trial? Have you left the room when you perceived your cholar increase? No! Then you had too great a desire to indulge it for that once. But if at that moment you could have perceived the end of a sword pointed at your heart, or a pistol at your head prepared to blow out your brains, if you had indulged your present humour,—think you not

that either of those weapons would have checked your fallies? And if once you are a conqueror of your passions, by the same means you may always conquer."

A N A L O G Y

BETWEEN

PLANTS AND ANIMALS.



“ WHAT book is that you are perusing ? ”

“ It is my *Spectacle de la Nature* ; but I do not comprehend one expression, *the food of plants* !—Do plants eat ? ”

“ No, not according to the common meaning of the word ; but plants require to have what, with propriety enough, may be termed their food : something to keep them alive, to nourish them, to make them grow in size.”

“ And what is that ?”

“ Plants must be inserted to a certain depth within the earth ;—to a certain depth, I said ; for if too shallow, they could not maintain their station ; and if but a little too deep, they grow sickly instead of increasing their size, and at last perish.”

“ Then earth is their food ?”

“ It should appear that earth affords the plants but little food, since by many nice trials, the soil wherein a tree is planted loses a very small portion of weight, in comparison of what the plant gains in bulk and weight ; therefore, it is supposed, that its food, as it is called, consists chiefly of water or air, or something floating in the air, which the plant
absorbs

absorbs through its leaves, the soil affording a resting place, or home, wherein it dwells, but which, however, must be congenial to the nature of the plant; some preferring bogs, some dry earth, some mountains, others vales, some clay, others sand, &c. But although we are not able to find out the cause of all these likes or dislikes, we know there is a wonderful analogy between plants and animals."

"Pray explain that."

"I have a paper prepared for that purpose for your use, and which I extracted from Smellie's Philosophy of Natural History. I have altered the language only for your better comprehension."

' In

‘ In all living bodies there appears a sameness of structure. In men and four-footed beasts are a series of bones which are connected, and which run from the head to the whole length of the back. This series is known by the name of the *back-bone*, from each side of which a number of arched bones proceed. Some of these join the breast-bone by means of cartilages*, and form a vaulted cavity, which contains and defends the heart, and the contents of the chest. The bones of the lower parts of the belly, and of the arms and legs, are joined to the back-bones by joints and small fibres, called membranes. By the same

* Frequently called gristles.

contrivance the skull is fixed to the upper end of the back-bones. Into different processes and portions of all these bones, a great number of fleshy fibres, called muscles, are inserted. The muscles are the means by which all the motions of the body are put in action. The bones of the skull contain the brain, and which is lengthened through the whole extent of the canal on the back-bone, and is there called the *spinal marrow*. From the brain and spinal marrow proceed all the nerves, from whence proceeds all sensation or feeling. These nerves are infinitely various and minute, and are branched out upon the heart, lungs, blood-vessels, bowels, and muscles, till they end on the surface of the skin. The heart

is the fountain from whence proceeds all the blood. When the heart contracts, the blood is driven through the arteries, which are branched out through every part of the body, the ends of which are veins, through which all the blood is brought back again into the heart; and this circulating process goes on whilst life lasts.

‘ Besides these organs, there are others termed *secretory*, because they separate certain fluids from the general mass of the blood. The stomach and bowels have a vast number of small tubes, called *lacteal ducts*, which separate and take in such parts of the food as tend to nourish the body, refusing all the grosser parts. These ducts, after a great many windings

windings and meetings with each other, unite into one large tube, which receives all the secreted liquor, and which is called the *chyle*. This mild fluid is carried by a vein to the heart, where it is mixed with the blood, with which it is conveyed through the whole body, and gives out nourishment as it passes through different parts. There are other particular organs for the separation of other fluids, as the kidneys for the urine, the liver for gall, &c. The plan is similar in birds and fishes; but in insects there is great variety both in their form and structure.

‘ Some insects, as the lobster and all the shell animals, have their bones on the outside of their bodies. To these bones the muscles and other parts

parts which tend to motion, are fastened. Many kinds have no bones, but their bodies consist of a succession of rings incased into each other. By contracting or dilating these rings, all the movements of their kind are performed. The head in some species changes its form every moment. It contracts, or dilates, or disappears, at the pleasure of the animal. In other species the form of the head is permanent.

‘ Some insects want eyes, ears, brain and nostrils. Others have an acute sense of smelling. Some insects have no lungs, but receive air by pores in their sides, and sometimes by long tubes, which stand out from parts of their bodies. Many insects have no heart; but in
these

these the blood moves by the impulse of the arteries. In a word, the structure and functions of animals descend, by degrees almost imperceptible, to that of plants.

‘ The structure of plants, like that of animals, consists in a series of vessels placed in regular order. These vessels are formed so as to take in food, promote growth, and to scatter the seeds. In the larger plants, as in trees, there are three distinct parts of much note,—the bark, the wood, and the pith. The bark again consists of three parts,—the skin, the body, and the inner circle. This last, at the end of Autumn, assumes the texture of, and becomes, wood. The bark consists of a number of air and sap vessels, which appear like fine threads, and which run

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from the root along the trunk, and through the branches. Besides these vessels, the bark has a pulpy substance, in which are a vast number of small bladders, by which the bark is joined to the wood by transverse insertions.

‘ The wood consists of *two* distinct parts,—the one dense and compact, the other porous, moist and pulpy. A portion of wood is placed alternately between this soft matter, and which comes in alternate portions from the edges of the pith, growing wider as they proceed further from the center. Both the woody part and pulpy matter, like the bark, have sap and air vessels.

‘ The pith or heart is bounded on all sides by the wood. The pith consists of a vast number of air and
sap

sap vessels, interwoven with the pulpy matter and small bladders, not unlike the tissue of gauze or lace. This texture is common to every part of the trunk, being only more close and compact in the bark and wood than in the pith. The pith of plants grows less as the age increases, because every year the ring of vessels which adjoins to the wood, dries and becomes itself wood.

‘ The leaves of plants consist of a fine skin, which incloses the pulp. This skin, like that of animals, is an organic body, with an immense number of woody fibres, and interwoven in a manner like to that of the trunk and branches. When the skin is taken off, the pulp appears covered all over with small fibres in

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the form of a cylinder*, wound up into minute bladders. A large nerve runs through the middle of every leaf, and sends off branches, which decrease in size, till they reach the edge or disk. In this nerve are small tubes, which, at proper distances, go off, and are thrown over the whole leaf in the same manner as the nerves over the human body.

‘ Flowers and fruits have the general texture already described, and differ only in the number of the woody vessels, or pulpy substance. That these have secretory glands or vessels appears from their tastes, odours, and colours; and this chiefly from the flowers or fruit. The

* A body having two round and flat surfaces, and one circular.

glands of some fruits, as those of the lemon and orange, secrete liquors of different qualities. The vessels of the rind contain an acrid oil, while those of the pulp secrete a pleasant acid.

‘ The analogy between plants and animals is further proved by the analogous parts of both to answer the same purpose.

‘ The motions through both are by means of vessels; and both of these classes of beings have vessels for similar offices. In animals, the fluids are circulated by the pulsation of the heart and arteries. The juices of plants do not circulate, but they are raised from the root to the trunk, branches, leaves, flowers, and fruit, by the sap vessels. But, though

no motion is perceived in the sap vessels, like the pulsation of the arteries, yet, as the sap moves with great force, it implies an action in the vessels. In animals, the urine, the spittle, &c. are all from the general mass of blood, by the act of certain vessels. These fluids exist not in the blood itself, but are caused by some unknown power of nature of the vessels of their proper glands. In plants also the sap ascends, and different fluids are formed by the vessels of the glands. The same effects are seen both in the animal and the plant; we must, therefore, suppose from the same cause the action of the vessels. Besides, the sap, which is the blood of plants, moves with a force often equal to the weight

weight of the atmosphere. By means of coloured liquors, sap has been seen to move three inches in an hour; and it has been proved, that plants transpire through the leaves. It has been also thought that they are the cause of the rising of the sap; but that at present is doubted. Hence the sap of plants is not taken up in the same manner as a sponge imbibes water, but is forced to ascend by some unknown power of the vessels. But by whatever powers the sap is moved, its motion is certain; and that it produces the same in the plants, as the force of the heart and arteries does in the animals.

‘ But the motion of the sap is not a circulating one, similar to that of blood.

blood. Sap ascends and descends through the same vessels, and is changed by heat and cold. The sap rises briskly in a warm day, and descends during the night; like as the mercury rises or falls in the tube of a thermometer. But though the analogy here fails with regard to man, and the larger animals, yet it holds in some, as the polypus, and many insects, in which there appears not the least trace of circular motion in their fluids.

‘The pith of plants bears some likeness to the brain and spinal marrow of animals. When the texture of the brain or the spinal marrow is destroyed, life is extinguished; and when the pith of plants is destroyed or dried up by age, they no longer

longer retain the powers of life. The leaves of plants act as lungs to animals. It is by the lungs that animals perspire, and through which plants throw out their moisture when it abounds too much. They expose so large a surface to the action of the sun, that they transpire so much as to throw out fifteen or twenty times more in a given time than issues from the human body. If the leaves of a plant are taken away or injured, instead of fruit growing perfect and ripe, and of its proper flavour, the plant becomes sickly, and sometimes dies, for want of those organs that carry off the too many juices that may arise from the root. A plant in this state may be said to labour under a disease like
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the asthma, and may be said to be choked.

‘ Besides the leaves, plants transpire by the pores of the bark or skin. But what is thrown off in this manner, is by no means equal to that which issues through the leaves. The same thing happens to the larger animals. Though they likewise perspire through the skin, yet not equal to what is sent out by the lungs. Besides throwing off superfluous or noxious matter by the leaves, plants, by the same organs, absorb from the air, and perhaps from the sun’s rays, some matter which promotes their growth. The lungs of animals also derive, from the same sources, something, without which life could not exist.

‘ There

‘ There is one other analogy between the structure of plants and animals. The round bones of animals consist of concentric strata or plates, which can be separated; and the wood of plants consist of concentric layers or vessels grown hard, and which divide, if laid long enough in water. A tree acquires a new ring every year; and by counting these rings the age of the plant may be known.

‘ Some, without good reason, have compared the branches of trees to the arms of man. But this seems strained too far. The great use of branches seems to be to produce a great number of leaves, whereby a large surface is exposed to the air and sun, to answer the great uses of throwing

throwing off useless matter, and taking in what is the food of life. If there be any likeness to the arms, it must only be in those that twist themselves around poles or trees, as the ivy, the vine, &c.; and to such as support their trunk on other bodies, by means of little hooks, as the goose-grass, and many other kinds.

‘ All these analogies, we should remark, belong to large animals and large plants ; but they hold not in the tribe of plants called grasses. Instead of being filled with wood and pith, the stems of these are quite hollow ; and to strengthen these plants, nature has given them strong joints or knots, which are placed at proper distances in each species. But, though some of the analogies
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which are found to exist in the large animals and plants, are not found in the small ones, this fact, instead of breaking, confirms the general plan of nature. To see the analogies between plants with tubes, and animals, we must examine the structure of the small tribes of animated beings. The grasses have neither pith nor wood; and the polypus, the worm, and many other insects have no bones, heart, or bowels, but are simple tubes, like the empty stems of the grassy plants. Besides, the woody part of these plants, is placed on the outside, similar to the shells of animals whose bones are placed on the outside.—Another strong analogy, and the last that we notice. The juicy (called *succulent*)

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plants,

plants, such as the house-leek, mushrooms, and many sea-plants, consist almost of pulpy substance, and may be crushed to jelly by the slightest pressure ; similar to which is the texture of worms, caterpillars, and of all the soft insects.’

GROWTH AND NOURISHMENT.

‘ THE second source of analogies between the plant and the animal, is, from the modes of their growth and nourishment.

‘ Animals, like plants, expand by degrees from a state like jelly, and, according to their kinds, arrive sooner or later at maturity. This increase in size is known by the word *growth*. Without some nurture taken into the body, and changed by the action of
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of vessels to the substance of that being which receives it, growth cannot take place. Moisture is the chief food of plants; but the food of animals, in general, varies with the species. This fact led some to conclude, that every plant extracted from the soil a food peculiar to its own nature. It has been, however, proved, that plants can grow, and acquire both bulk and weight, without consuming the earth wherein it is planted: a strong proof that moisture contributes much to nourish plants. It likewise shews that plants, however they may differ in figure, shape, or fibrous arrangement, are more simple in their texture than animals. Yet, although there are these seeming differences between the

food of plants and animals, nature fails not to observe the same course in both. The food of the animal before it is converted into nourishment, must go through the process of digestion, by which it is changed into a white juice (called *chyle*); this into blood ; and from this blood all the animal fluids are derived. Here the strong analogy appears. Moisture is to the plant, what blood is to the animal. Each of them extracts its food from a common fluid, which is changed by the act of vessels through which they pass, into the various juices peculiar to the different species.

‘ When growth first begins, the young plants and animals are in a like state. Before birth, the animal is inclosed

closed in a web of small fibres (called *membranes*), and is fed, till mature for birth, by blood which it receives from its mother. In the same manner, the young plant is inclosed in the membranes of the seed, and its fibrous roots are spread over the lobes or pulpy part. After the seed is sown, and it begins to spring, it is fed by moisture, which the lobes absorb from the earth, and convey it to the small tubes of the feminal root. In many plants these lobes rise above the surface of the ground in the form of leaves, and continue to nourish and protect the tender stem, till it acquires strength to support the assaults of the air and weather. A plant in this state may be said to have two roots; one, the fibres of

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which

which are spread through the substance of the lobes, or seed leaves, and another which adheres to the soil.

‘ The food thus given to plants by the seed leaves, is very like to that of animals by the milk of the mother. The texture of young animals is so lax, that food suited to more mature years would soon put an end to their existence. But nature has wisely taken care of this event. She has given to females a set of vessels which yield a certain mild liquor, and of such a nature as to be proper for their tender state whilst young. The same care is taken to provide food for the young plant. For some time after the stem and young roots have begun to shoot, their texture

is

is so very tender, that they are not able to support each other without some foreign aid. This aid is yielded them by the seed leaves. These leaves absorb dews, air, and other fine fluids which float in it, and which are so changed by their passage through vessels, that they afford food to the stem and root. Hence it appears that the process of nourishment with animals and plants in their infant state is nearly alike.

‘ Plants, like animals, pass by degrees from the infant state, to that of puberty, at which period they are firm of texture, and are come to that perfect state, as enables them to produce beings quite the same as themselves. In both, the age of puberty arrives later or more early, according

according to the kind of species. Some animals only live a month. Many of the insect tribe are born, grow up, bring forth young, and die in the course of a single season. Others, as flies, beetles, &c. exist two years. The dormouse lives six years; the hare seven or eight; the bear twenty-five; the camel forty or fifty; the rhinoceros seventy or eighty; the elephant two hundred; and some birds and fishes are supposed to exist during three or four centuries.—It is the same with plants. Some plants are annual, as most of the esculent or eatable kind; are biennial, or live two years, as the hedge-parfley, the wild carrot, the parsnip, the fox-glove, the scurvy-grass, &c.; others exist three, five, seven,

seven, ten, twenty, thirty, sixty, and a hundred years; and the oak, like the elephant, is a tenant of the forest for some hundreds of years.

‘ The manner in which nourishment is drawn from the food, is similar in the animal and the plant. In the animal this work is performed by lacteal vessels, which are spread over the inner surface of the stomach and bowels. In the plant the same office is the work of the root and leaves. Hence animals are beings nourished by roots within their bodies; and plants are nourished by roots through which they absorb their food, which roots are placed on the outside of their bodies.

‘ Warmth and moisture favour the growth of large juicy plants; and

and such animals as feed upon these rich and juicy plants, are likewise larger than those which inhabit cold countries, where plants are smaller, more rigid, and contain less nourishment.

‘ Some plants only grow in certain climates. A species of bramble common in Norway and Canada, hardly endures the climate of Upsal, in Sweden. But the chick-weed, and several kinds of grasses, grow almost over the whole globe. So also some animals, as the camel, rhinoceros, and the elephant, are brought forth in warm climates only; while others, as the rein-deer, glutton, and marmot, are brought forth in the colder regions. But man, like some grasses, inhabits every climate.

‘ Some

‘ Some plants, as well as some animals, live both on the earth and in the water; as the rush, and the frog. Others feed on the juices they extract from different species to which they adhere. The mistletoe feeds on the oak. Most trees afford food to certain mosses and fungous plants; and most animals are fed upon by smaller kinds.

‘ The growth of plants, like that of animals, may be promoted or retarded, the more or the less they perspire, or by excluding them from exercise and air. When men or other animals are prevented the free access of pure air, their growth is retarded; and their sickly colour shows a defect of vigour. Plants placed in a like state are weak and dwarfish,

dwarfish, and of a sickly colour. But exercise is necessary to the health of both plants and animals. The motion of animals is by their own free will ; but the motion of plants is not so, but the effects of the air. The action caused by the winds enables them to extend their roots, prevents them from a growth too rapid, and of course makes them stronger. For want of this action, plants brought up in houses shoot out beyond their natural length so much, that their stems and branches are always slender and weak, nor do they ripen their fruit equal to those which are exposed to the open air.

‘ In short, plants and animals are so nearly allied, that their growth and
nourishment

nourishment are not only effected by similar means, but some parts of animal bodies partake of a vegetable nature. The hair, nails, beaks, and horns of animals, are similar to plants in their growth and want of feeling.'

PRODUCTION AND DECAY.

' The power of producing beings similar to the parent, is peculiar to the plant and animal. The mode of this wonderful effect appears different, but is more in appearance than in reality, as will be attempted to be shewn.

' One class of animals bring forth their young alive, (called *viviparous*); the other lay eggs (called *oviparous*), which must undergo another process, called *hatching*, and this either
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by the heat of the sun, or by the mother. Some animals are produced by neither means; and there are others which unite both modes.

‘ Those which are brought forth alive, are men, four-footed beasts (*quadrupedes*), some fishes, reptiles, and insects. Those produced by eggs include birds, some reptiles, and most of the insect tribes. But the armed polypus produces its species by sending off shoots from its own body. Another species is produced by splitting lengthwise. In twenty-four hours, these parts, which stick to a common foot stalk, resplit, and become four distinct animals. These four, in an equal time, again split; and thus they proceed doubling their numbers daily, till they assume
a figure

a figure something like a nosegay. The young, after this, divide from the parent stock, attach themselves to the roots or leaves of trees, and each one gives rise to a new colony.

• The small animals found amongst infusions and other things were long a subject of doubt amongst the learned; and it was thought by many they were produced from putrid matter without a common parent. But this fact has been proved not well founded by the nicest and best trials; and it is now well known that nothing exists without a cause, without a parent. These small creatures found in mixtures, divide themselves. M. de Saufure says, "I put one of these into a drop, which split before my eyes. Next
Q 2 day

day I had five ; the day after sixty ; and on the third, the number was more than I could count."

‘ Without noticing more particulars in the production of animals, let us take a view of the many striking analogies between the eggs of animals and the feeds of plants.

‘ When placed in proper situations, they both produce young every way similar to the parents. To effect this wonderful event, the egg requires impregnation and heat. The plant requires moisture, warmth and soil.

‘ The inner parts of the egg are guarded by a crust or shell, and two membranes. Besides these, the yolk has a membrane for itself. When the two first membranes are taken off,

off, the white appears all round the yolk every way. In the white, a small speck may be seen, in the center of which is the future animal. After two or three days in the act of hatching, this part becomes red, and shoots out blood-vessels, which are spread through the yolk.

‘ A seed is also guarded with a shell, or crusty matter. Another invests the whole kernel or pulpy lobes of the seed. Each lobe, like the yolk of an egg, is in a separate membrane. In every seed there is also a small speck, through which the young plant issues. Under this the future plant may be seen. The branches of the young roots proceed from this, and are spread through the substance of the lobes

similar to the blood-vessels through the yolk of the egg. It is by the pulp of the lobes that the young roots and infant stems are nourished, till the one shoots down into the soil, and the other rises above its surface. In seeds there is nothing like the white of eggs, and such a substance is not wanted; for the earth supplies that moisture to the plant, which the white does to the chick. The eggs of fishes have no whites, having the moisture of the water.

‘ It may be thought that there is not much analogy between the production of plants with the animals brought forth alive. But plants may be produced from buds. Now a bud has no analogy in texture or likeness

likeness to a seed. Buds arise from the stems or branches of plants. One object in their formation is to produce leaves and branches, as well as to extend the length of the trunk or stem. But they can likewise produce new plants : and in this respect they may be considered as viviparous plants, because they produce out of their own bodies an organ which differs from a seed, is brought forth alive, and in due season becomes similar to its parent. The embryo of the bud is formed under the bark. Here it remains some time inclosed in membranes, and growing to the bark by small fibres, by which it is fed ; when at a certain point of time it pierces through the bark, and shoots out into open air. If not
taken

taken from the parent, it bursts its membranes, and becomes a new branch; but if taken away, and placed in a proper state, it becomes a new plant of the same species as its parent.

‘ Bulbous rooted plants, still furnish a stronger likeness between the increase of the viviparous animals and that of vegetable. If the coats of bulbous roots be dissected with care in autumn, the entire plant will appear in the center of the root. In spring, this small plant, like an animal before birth, pierces the coats of which the roots consist, grows till it flowers, ripens its seeds, and dies at the approach of winter, when a new plant is again formed in the old root. The same analogy is to be

be traced in those roots which have what are called *eyes*, like the potatoe. These eyes are all plants in miniature, which live in that state during winter, and, when committed to the soil, come to maturity in summer.

‘ There are still other modes of increasing, common to the animal and the vegetable. Many plants are multiplied by suckers, slips, and cuttings.

‘ The animal kingdom affords examples of all these modes of multiplying. The suckers of plants are an exact likeness to the shoots of a polypus. When separated from the parent, the sucker becomes a perfect plant; and the shoot of the polypus a perfect animal. Plants may be multiplied by slips and cuttings: so
may

may the polypus. The cuttings, however small, or in whatever direction, reproduce and become perfect animals of the same species.

‘ But some species of the polypus, and several of the animalcules which appear in infusions, multiply by splitting. Here the analogy, the animal and the vegetable, might be supposed to fail. It is yet to be traced in the water-lentil, a small plant which covers the surface of stagnant pools, and multiplies its species by detaching thin films from the under sides of its leaves. These films or tender leaves produce roots, and which in due season become regular plants.

‘ There yet remains another analogy to be unfolded. All animals
have

have their seasons peculiar to their respective kinds. Some of the larger animals produce in the spring, others in summer, others in autumn, and others in winter. Amongst insects their seasons are still more various. Every month, every week in the year, gives birth to different kinds. The seasons of plants are also varied in a similar manner. The growth of different vegetables is continued through the whole year. Particular tribes spring up at some uniform periods. The kind intentions of nature are evident through this varied arrangement. If all plants were to burst forth at the same time, they would destroy each other; they would be choked:—the surface of the whole earth would not yield them
room

room that would suffice for existence. Nature has, therefore, wisely ordained, that the earth should always be covered with plants ; but she also has as wisely ordained, that particular tribes should die at stated periods, to make way for the existence of others.

‘ The same thing would happen if nature gave birth to all animals at the same season. By the insect tribes we could not breathe without drawing in swarms. The air would become so much polluted by the crowd of noxious creatures, that neither man nor beast could exist. Besides, certain plants grow only at certain seasons ; such species of animals as feed on particular plants only, must therefore perish for want of food,
if

if they came forth at the wrong season. In Lapland, where the summer is short, all the insects which dwell on that barren spot are produced in a short space : and though the number of species in that country be but small, the inconvenience arising from their numbers is great.—But every natural evil has some good. The rein-deer, upon which the existence of the Laplander depends, are so teized by swarms of flies, that to avoid them they fly from the vallies and seek the mountains, where it is too cold for the flies to follow. In these cool regions the rein-deer feed during the hot season, and return to the vallies after the cold has destroyed their tormentors. This forced migration has two good effects ;

it both preserves the health of the rein-deer, and their food in the vallies, which, without this, would be too soon exhausted.

‘ The operation called engrafting was long thought to belong only to plants; but it has been found, that upon several species of the fresh-water polypus this process succeeds. The flower-fish, called sometimes the sea-nettle, may be grafted on a different species with success. The portions of the divided animals grow together and become distinct creatures.

‘ Having traced the general analogies between the animal and vegetable, from its first state, till matured, and the office performed of multiplying their species, the next
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and last awful state is the decay and final termination of the existence of every creature in both kingdoms.

‘ It is a certain law of nature, that all organized bodies tend towards a dissolution. The periods of life vary according to the species : but before death arrives, plants, as well as animals, are subject to a number of diseases. When overcome with heat, plants show marks of languor and fatigue : — their leaves become flaccid, their stems and branches bend towards the earth, the juices fly off, and their whole texture seems weak and on the decline. Too great a degree of cold makes the flowers, the leaves, the bark, and even the woody fibres shrivel and contract in their size.

When deprived of light and air, their colours fade, and they soon obtain a sickly aspect. They would be starved, if not fed with their proper food. The growth of plants as well as animals is checked by scanty supplies of food. When the soil or place does not suit the plant, it becomes weak and small, nor has it the power of producing new ones. Plants may be poisoned by taking in fluids hostile to their nature. Besides all these things common to the plant and animal, they are both liable to diseases.

‘Sometimes disease attacks the leaves only, which brings on spots of various colours, pimples, and galls. Sometimes the flowers and fruit become sickly, and which causes

causes them to become barren for that season. Sometimes a plant remains barren during life. Some disorders attack the internal organs, and obstruct the juices, from which cause arise tumors, and the whole fabrick suffers. Insects cause sickness amongst plants. The wounds which they inflict extend from the root to the stem, branches, leaves, flowers and fruit. Insects not only injure the substance of the plants, but, by feeding on their juices, deprive them of part of their nourishment, and cause various changes in their system. Sickness is often caused by change of climate, from foul air, and vapours floating in the air, and from improper treatment. When wounded, plants discharge their blood in copious streams. If
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the wound be not mortal, the fibres on all sides shoot out, and close the part by a callous substance.

‘ From this short statement, it is plain, that the diseases of plants are not only like those of animals, but proceed from the same causes. In both some disorders are only partial, and are cured by nature, or assisted by art. Others are mortal, attack the whole frame, and death ensues.

‘ But though plants should escape the many diseases which daily await them, they have no defence against the slower approaches of old age, which brings on certain death. In the progress of time the vessels grow hard, and lose their tone. The juices no longer move so briskly as in youth; they are not absorbed with equal ease; and they at last stagnate

stagnate and become corrupt. This soon attacks the vessels, which contain the juices, and the effect is, that all the vital functions cease.

‘ The life of man is strongly marked by a number of changes. Infancy, youth, manhood, old age, are characterized by weakness, beauty, fertility, dotage. All these changes appear in the vegetable world. Weak and tender in infancy, beautiful and strong in youth, robust and fruitful in maturity, and at the approach of old age, the head droops, the springs of life dry up, and the tottering plant, like the animal, returns to that dust from whence it sprung.

‘ Upon the whole, by taking a view of the great difficulty of discerning the bounds which distinguish

guish the animal from the vegetable, and of the sameness in their structure and organs, in their growth and in their food, it is apparent that both of these kingdoms constitute the same order of beings, and that nature, in the creation of them, has worked upon one great and common model.'

"Well, I never was so much struck with any thing that I have read as the contents of this paper; and could never have thought, if I had not been told, that there was any resemblance between a growing tree, and a walking animal! But I find the more I know, the more I have to learn."

THE END.

