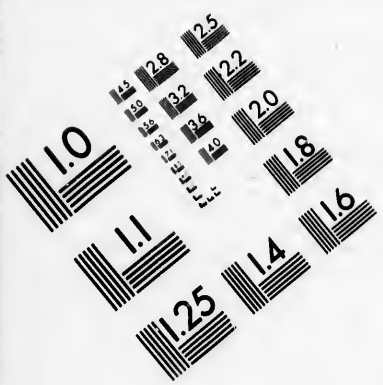

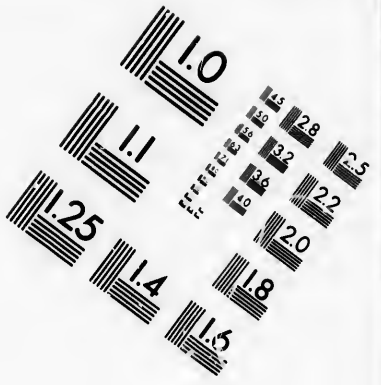

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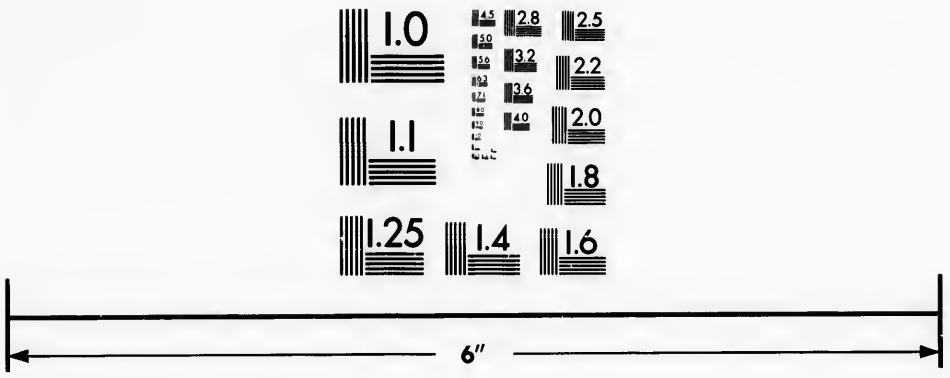

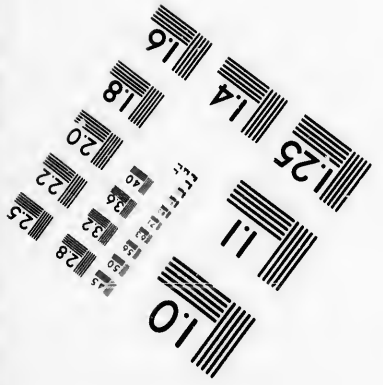

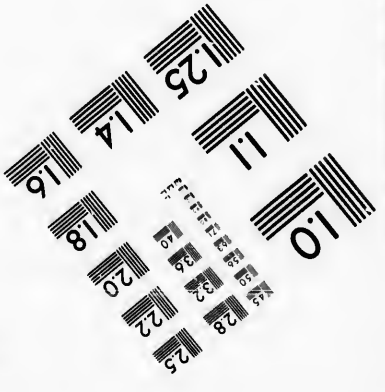

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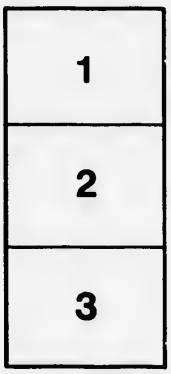

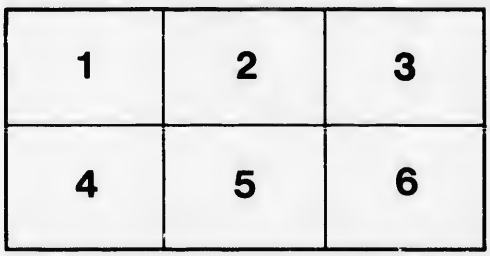

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READING-BOOK.

No. V.

I.—PLANTS, &c.
II.—THE HOUSE I LIVE IN.
III.—THE ANIMAL KINGDOM—INSECTS, &c.
IV.—BIRDS.

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READING-BOOK.

I.—PLANTS.

1.—THE WORKS OF GOD.

THERE is a book, who runs may read,
Which heavenly truth imparts;
And all the lore its scholars need,
Pure eyes and Christian hearts.

The works of God, above, below,
Within us, and around,
Are pages in that book, to show
How God himself is found.

Thou, who hast given me eyes to see,
And love a sight so fair,
Give me a heart to find out thee,
And read thee everywhere.

Keble.

THE VISIBLE CREATION.

The God of nature and of grace
In all his works appears;
His goodness through the earth we trace,
His grandeur in the spheres.

Behold this fair and fertile globe,
By him in wisdom planned;
'Twas he who girded, like a robe,
The ocean round the land.

Lift to the firmament your eye,
Thither his path pursue;
His glory, boundless as the sky,
O'erwhelms the wondering view.

The forests in his strength rejoice;—
Hark! on the evening breeze,
As once of old, the Lord God's voice
Is heard among the trees.

Here on the hills he feeds his herds,
His flocks on yonder plains:
His praise is warbled by the birds;—
Oh, could we catch their strains!

Mount with the lark, and bear our song
Up to the gates of light;
Or, with the nightingale prolong
Our numbers through the night!

In every stream his bounty flows,
Diffusing joy and wealth;

In every breeze his Spirit blows,
The breath of life and health.

His blessings fall in plenteous showers
Upon the lap of earth,
That teems with foliage, fruit, and flowers,
And rings with infant mirth.

If God hath made this world so fair,
Where sin and death abound,
How beautiful beyond compare
Will paradise be found! *Montgomery.*

HEAVEN.

I praised the earth in beauty seen,
With garlands gay of various green;
I praised the sea, whose ample field
Shone glorious as a silver shield;
And earth and ocean seemed to say,
"Our beauties are but for a day."

I praised the sun whose chariot rolled
On wheels of amber and of gold;
I praised the moon whose softer eye
Gleamed sweetly through the summer sky;
And moon and sun in answer said,
"Our days of light are numbered."

O God! O good beyond compare!
If thus thy meaner works are fair;
If thus thy bounties gild the span
Of ruined earth and sinful man;
How glorious must the mansion be
Where thy redeemed shall dwell with thee!

Heber.

2.—FLOWERS.

Among the many sources of enjoyment which God has given to us on earth are the flowers, scattered wild and free over the face of nature like a garland of beauty.

"Bright clustering in the forest shade,
Or springing from the sod,
As flung from Eden, forth they came,
Fresh from the hand of God!
No human care hath nurtur'd them,—
The wild wind passeth by;
They flourish in the sunshine gleam,
And tempest-clouded sky:
And oh! like every gift that He,
The bountiful, hath given,
Their treasures fall alike to all,—
Type of his promised heaven."

The woodland and the meadow, the mountain and the valley, each sends forth its rich offering of flowers. We see them bordering the footpaths, adorning the hedgerows, smiling in the shady wood, and in sweet clusters decking the river banks. Each situation and each season has its peculiar flowers.

Let us thank God for so clothing the earth with beauty.

THE USE OF FLOWERS.

God might have bade the earth bring forth
Enough for great and small,
The oak-tree and the cedar-tree,
Without a flower at all.

He might have made enough, enough
For every want of ours,—
For luxury, medicine, and toil,—
And yet have made no flowers.

The ore within the mountain-mine
Requireth none to grow,
Nor doth it need the lotus flower
To make the river flow.

The clouds might give abundant rain,
The nightly dews might fall,
And the herb that keepeth life in man
Might yet have drunk them all.

Then wherefore, wherefore were they made,
All dyed with rainbow light;
All fashioned with supremest grace,
Upspringing day and night;

Springing in valleys green and low,
And on the mountains high,
And in the silent wilderness,
Where no man passes by?

Our outward life requires them not,—
Then wherefore had they birth?
To minister delight to man,
To beautify the earth;

To comfort man,—to whisper hope
Whene'er his faith is dim;
For who so careth for the flowers
Will much more care for him!

Mary Howitt.

3.—"CONSIDER THE LILIES OF THE FIELD."

THE richest clothing or the most curious embroidery will not for a moment compare with the beauty of a flower. When examined through a microscope, the most finished and delicate work which the skill of man can produce looks coarse and rough. But it is not so with a flower; for the more closely it is examined, the more beautiful it appears. Even flowers that we commonly call weeds, when viewed through a microscope, display a beauty and delicacy of form which no skill or art of man can equal.

He who is not only Christ our Saviour, but the Lord and Creator of all, for "by him all things were made," knew the perfection of his own handiwork, and thus taught his disciples to learn a lesson from the lilies of the field:—

"Consider the lilies of the field, how they grow; they toil not, neither do they spin:

"And yet I say unto you, That even Solomon, in all his glory, was not arrayed like one of these.

"Wherefore, if God so clothe the grass of the field, which to-day is, and to-morrow is cast into the oven, shall he not much more clothe you, O ye of little faith?

"Therefore take no thought, saying, What shall we eat? or, What shall we drink? or, Wherewithal shall we be clothed?

"(For after all these things do the Gentiles seek;) for your heavenly Father knoweth that ye have need of all these things.

"But seek ye first the kingdom of God, and his righteousness; and all these things shall be added unto you.

"Take therefore no thought for the morrow: for the morrow shall take thought for the things of itself. Sufficient unto the day is the evil thereof."

Lo, the lilies of the field!
How their leaves instruction yield!
Hark to Nature's lesson given
By the blessed birds of heaven!
Every bush and tufted tree
Warbles sweet philosophy:—
"Mortal! fly from doubt and sorrow:
God provideth for the morrow!

"Say, with richer crimson glows
The kingly mantle than the rose?
Say, have kings more wholesome fare
Than we, poor citizens of air?
Barns nor hoarded grain have we,
Yet we carol merrily.
Mortal! fly from doubt and sorrow:
God provideth for the morrow!

"One there lives whose guardian eye
Guides our humble destiny;
One there lives who, Lord of all,
Keeps our feathers lest they fall:
Pass we blithely then, the time,
Fearless of the snare and lime,
Free from doubt and faithless sorrow:
God provideth for the morrow!"

Heber.

4.—THE COLOURS AND SHAPES OF FLOWERS.

MAN, with all his knowledge, cannot tell how the colours of a flower are produced. Let him watch a rose-bush. He sees at first a little green bud, which becomes larger every day, till it begins to open, and the red leaves of the flower appear all folded together. Gradually these leaves spread out, and at last he sees a full-blown rose. He may know that the flower is made from the sap or juice of the plant, and that there are little pipes through which the sap flows to all parts of it, just as the blood circulates in the human body; but how it is that one flower becomes red and another white, the wisest man on earth cannot tell. It is a secret which God has not permitted us yet to find out. The beauty of the rich blossoms of the flowers tells us that they were painted by no earthly hand, but are the work of Him who is infinite in wisdom and in power.

Not a flower
But shows some touch, in freckle, streak, or stain,
Of His unrivalled pencil. He inspires
Their balmy odours, and imparts their hues,
And bathes their eyes with nectar, and includes,
In grains as countless as the sea-side sands,
The forms with which he sprinkles all the earth.
Happy who walks with him! whom what he finds
Of flavour or of scent in fruit or flower,
Or what he views of beautiful or grand
In nature, from the broad majestic oak
To the green blade that twinkles in the sun,
Prompts with remembrance of a present God.

Cowper.

There are flowers of every variety of colour, and each season has flowers peculiar to itself. January has its snowdrops, February its crocuses, June its roses, and August its flowers of every hue.

There are flowers also of every variety of shape; and the shape often gives a flower its name. Some are like stars, and are called *asters*, from a Greek word signifying a star. Such are the China-asters that we see in gardens.

Other flowers are shaped like butterflies, as the pea blossom, and the blossom of the common broom and furze.

The flowers of the lily of the valley hang like little bells from the stem: and the beautiful little blue-bells, which we find in the hedgerows and on the common, have their name from their bell shape.

Other flowers are cup-shaped, as the well-known bright yellow butter-cup, and the narcissus, which has in the middle a little shallow cup something like a bowl.

The flower of the calceolaria[1] hangs down like a bag or pocket, having a round opening above.

Some flowers are shaped like a trumpet, as is the case with an American plant called the trumpet-creeper, the blossom of which is so deep that the humming-bird is almost covered by it, when he goes to seek honey in the bottom of the flower.

The blossom of the snap-dragon has a very peculiar shape. By pressing it together sideways, it can be made to open like a mouth; and in it are little white things that look like teeth. By letting it go, this mouth snaps together again; and from this the flower obtains its name.

Some flowers are called *compound*, because each flower

---

[1] Pronounced cal-sē̆o-lā̆ā̆-rĭ-a

is made up of a great many others. The dandelion[1] is a flower of this kind, each blossom having a great number of flowers in it, which severally appear very beautiful when closely examined.

The daisy is a pretty little flower of the same kind. In its golden yellow bosom it has a multitude of little flowers close together; and around this yellow part there is a row of delicate leaves, sometimes white and sometimes beautifully tipped with crimson.

THE DAISY.

Not worlds on worlds, in varied form,
  Need we to tell a God is here;
The Daisy, fresh from winter's storm,
  Speaks of His hand in lines as clear.
What hand but His who arched the skies,
  And pours the dayspring's[2] living flood,[3]
Wondrous alike in all He tries,
  Could raise the Daisy's simple bud,

Mould its green cup, its wiry stem,
  Its fringed border nicely spin,
And cut the gold-embossed gem,
  That, set in silver, gleams within;
And fling it, unrestrained and free,
  O'er hill, and dale, and desert sod;
That man, where'er he walks, may see
  At every step the trace of God!

---

[1] *Dandelion*—corrupted from the French, '*dent de lion*, tooth of the lion.
[2] *Dayspring*—rise of day, dawn. [3] *Living flood*—of light.

THE DAISY.

ON FINDING ONE IN BLOOM ON CHRISTMAS-DAY.

THERE is a flower, a little flower,
With silver crest and golden eye,
That welcomes every changing hour,
And weathers every sky.
The prouder beauties of the field
In gay but quick succession shine;
Race after race their honours yield,—
They flourish and decline.

But this small flower, to Nature dear,
While moons and stars their courses run,
Wreathes the whole circle of the year,
Companion of the sun.
It smiles upon the lap of May
To sultry August spreads its charms,
Lights pale October on its way,
And twines December's arms.

The purple heath and golden broom
On moory mountains catch the gale;
O'er lawns the lily sheds perfume,
The violet in the vale;
But this bold floweret climbs the hill,
Hides in the forest, haunts the glen,
Plays on the margin of the rill,
Peeps round the fox's den.

Within the garden's cultured round
It shares the sweet Carnation's bed;

And blooms on consecrated ground,
In honour of the dead.
The lambkin crops its crimson gem,
The wild-bee murmurs on its breast,
The blue-fly bends its pensile[1] stem
Light o'er the skylark's nest.

'Tis Flora's[2] page:[3]—in every place,
In every season, fresh and fair,
It opens with perennial[4] grace,
And blossoms everywhere.
On waste and woodland, rock and plain,
Its humble buds unheeded rise;
The Rose has but a summer reign,
The Daisy never dies.

5.—HABITS OF FLOWERS.

FLOWERS have habits, or ways of acting, just as people have. For example, all flowers naturally turn toward the light, as if they loved it. This can be seen by watching plants that are standing near a window. The flowers will all be bent toward the light, if the pots are allowed always to stand in the same position; but by turning them round a little every day, while the blossoms are opening, the flowers can be made to look in different directions.

There are some flowers that shut themselves up at night, as if to go to sleep, and open again in the morning,

---

[1] *Pensile*—hanging, bending.
[2] *Flora*—the goddess of flowers.
[3] *Page*—an attendant.
[4] *Perennial*—perpetual.

as is the case with tulips. The writer was one morning admiring some flowers that had been sent to him the evening before. Among them were some tulips, and out of one of these, as it opened, flew a bee! A lazy, dronish bee he must have been, to be caught in this way, when the flower was closing for the night. Or, perhaps, he had done a hard day's work in gathering honey, and at last had become sleepy. At any rate, he stayed too long in the tulip, and so was shut in for the night.

The little daisy is one of the flowers that close at night; but it is as beautiful and bright as ever, on its "slender stem," when it awakes in the morning. When it shuts itself up, it forms a little round green ball, and looks something like a pea, and can hardly be distinguished from the green grass amidst which it lies. But look next morning, and the ball is open, showing, as the poet describes, "a golden tuft within a silver crown." It is a very beautiful sight indeed to see the grass spangled with daisies, shining in the bright sun. It is supposed that this flower was first called *day's eye*, because it opens its eye at the dawn of day, and that afterwards the name became corrupted to *daisy*.

The golden flowers of the dandelion are shut up every night, and they are folded so closely together in their green coverings, that they look like buds which had never been opened. In places where the sun is very hot, the dandelion shuts itself up even during the day; and in this way it is sheltered in its green covering from the sun, and kept from fading.

Some flowers hang down their heads at night, as if nodding in their sleep: but in the morning they lift them up again, to welcome the light. Other flowers have a par-

ticular time to open. The evening primrose, for example, is so called because it does not open till evening.

The splendid flower called the night-blooming cereus, opens only once. It lets its beauty be seen but for a few hours, and then it fades and dies. It is a very rare flower, and few ever have an opportunity of seeing it. Those who have, watch for its opening with great eagerness. It opens generally very late in the evening, and is closed again in a few hours, thus never admitting the light of day into its bosom.

Through spring, summer, and autumn, we have a constant succession of flowers, each having its own season, and opening at its appointed time every year. God has kindly provided us with beautiful things to look upon, in the garden and in the field, during all the warmer months of the year. Let us thank him for his goodness.

The flowers that bloom in spring are generally small and delicate.

Summer flowers are more abundant than those of spring or autumn, and are scattered abroad in rich profusion, of every variety of colour and form. They are commonly very fragrant, so that the air is filled with pleasant odours.

Autumn flowers generally have bright colours, and are very showy; but few of them have any fragrance.

6.—WHAT LIVE ON FLOWERS.

Besides being beautiful for us to look upon, many animals get their food from flowers. Different kinds of small insects are to be found about them, living, it is supposed,

on the honey they find there. We can even see some of the larger insects gathering it. For instance, we know that the busy honey-bee goes from flower to flower, and gets a little honey from each; and when he has gathered as much as he can well carry, off he flies to lay it up in the hive. As there are a great many bees in one hive, each continually bringing his little load, they soon store up a large quantity of honey.

Come, honey-bee, with thy busy hum,
To the fragrant tufts of the wild thyme come,
And sip the sweet dew from the cowslip's head,
From the lily's bell and the violet's bed.
Come, honey-bee,
There is spread for thee
A rich repast in wood and field
And a thousand flowers
Within our bowers
To thee their nectar'd [1] essence yield.

Come, honey-bee, to our woodlands come,
There's a lesson for us in thy busy hum;
Thou hast treasure in store in the hawthorn's wreath,
In the golden broom and the purple heath;
And flowers less fair,
That scent the air,
Like pleasant friends, drop balm for thee;
And thou winnest spoil
By thy daily toil,
Thou patient, and thrifty, and diligent bee.

We may learn from the bee the wise man's lore.—
"The hand of the diligent gathereth store."
He plies in his calling from morn till night,
Nor tires of his labour, nor flags in his flight:
From numberless blossoms, of every hue,
He gathers the nectar and sips the dew.
Then homeward he speeds,
O'er the fragrant meads,

[1] *Nectar*—a Latin word, the name of the drink of the gods. Hence poetically used for anything of delicious sweetness.

And he hums as he goes his thankful lay. –
Let our thanks too arise
For our daily supplies,
As homeward and heavenward we haste on our way.

We usually speak of bees *gathering* honey; but this is not exactly correct. They *make* honey out of what they get from the flowers; and it is well known that they can make better honey with what they get from some flowers than from others. From the fragrant flowers of the garden, and the white clover of the fields, is made the delicate white honey that we sometimes see on the tea-table. The rich yellow honey is often made from the flowers of the heather.

Butterflies, though they do not make honey, yet also get their living among the flowers. As they fly about, they now and then rest upon a flower. This, however, is done not merely for the sake of resting, but to obtain food from the flower.

The humming-bird, a native of America, also lives on the flowers. This beautiful creature seems to be for ever on the wing when not resting in his nest. He is seldom seen sitting on a branch, as other birds do; and when he puts his long bill into a flower, he does not stand on anything, but is held up by his fluttering wings.

There are many other insects besides bees and butterflies that seem to get their living from flowers. St. Pierre, a Frenchman, once watched a strawberry-plant that he had in a flower-pot; and in three weeks he counted thirty-seven different kinds of insects that visited it.

In the middle of the day what a variety of insects are to be seen in a garden, some flying from flower to flower,

and some for ever on the wing, buzzing and singing as they hover in the air! But at night the scene is changed. The hum of the bees and the singing of the flies are done. The insects have got through with their work and their play, and have gone to the places where they sleep.

7.—SPRING IS COMING.

SPRING is coming! joyous Spring!
See the messengers that bring
Tidings, every heart to cheer,
That her advent bright is near.
See the many-coloured train
Peeping up on glade and plain;—
Crocuses and snow-drops white
Struggle into sunny light;
And the violet of blue,
And the valley's lily too.

I could dream their fairy bells
Ring a merry chime that tells
Spring is coming!—and when they
Faint and fade and fall away,
'Tis that, long by Winter nurst,
Their full hearts with joy may burst.

At the tidings that they bring,
"Spring is coming! welcome Spring!"
Children we of northern skies
Most her loveliness do prize—
Most, with longing hearts, we yearn
For her swift and sure return.

We who know the sullen gloom
When the earth is Nature's tomb,
Well may we, with heart and voice,
At the sweet spring-tide rejoice.

Dwellers in more genial climes!
Not for you these passing rhymes;
Ye can never understand
The contrasts of our northern land.
Ye are not so great and wise;
Ye have lowlier destinies
Than the children of a zone
Where the wintry blasts are known.

But gaunt Famine doth not stride
By the proud and wealthy's side;
There ye see not little feet
Press upon the frozen street,
While the infant's tearful eye
Tells its tale of misery

When in curtain'd, lighted hall,
What to you the snow-flake's fall!
When beside the blazing log,
What to you is frost or fog?
When on down your limbs you stretch,
Think ye of the homeless wretch?

To the poor it is that Spring
Doth her richest treasures bring;
And methinks that I do hear
Countless voices, far and near,
Joining in a grateful strain,
"Spring is come at last again!"

SPRING.

Old Winter must away, away!
He mopes about the house all day,
Looking so heavy, dull, and lone:
He must get ready and be gone.

See Spring before the door appear!
He's come to pull him by the ear,
To take him by the beard so gray:
He hath a rude, malicious way.

Gay Spring begins to knock and beat;—
Hark! hark! I know his voice so sweet:
With little lily-buds he drums,
And, rattling at the door, he comes.

And you must let him in straightway;
For he hath servants in his pay,
Whom he can summon to his aid,
And thunder through—he's not afraid.

First comes young *Morning-wind* so wild,
A chubby-cheeked and rosy child;
He'll bluster till all ring again;
He'll make you let his master in.

See *Sunshine*, gallant knight, advance!
He'll shiver through with golden lance.
Flower-fragrance, cunning flatterer!—think
How he can wind through every chink.

The *Nightingale* to th' onset sounds;
And hark! and hark! the note rebounds:
An echo from my soul doth ring!
Come in, come in, thou joyous Spring!

SPRING SONG.

Sweet Spring is returning;
  She breathes on the plain,
And meadows are blooming
  In beauty again.
Now fair is the flower,
  And green is the grove,
And soft is the shower
  That falls from above.

Full gladly I greet thee,
  Thou loveliest guest:
Ah, long have we waited
  By thee to be blessed!
Stern Winter threw o'er us
  His heavy, cold chain;
We longed to be breathing
  In freedom again.

And then, O thou kind one!
  Thou camest so mild;
And mountain, and meadow,
  And rivulet, smiled:
The voice of thy music
  Was heard in the grove;
The balm of thy breezes
  Invited to rove

Now welcome, thou loved one,
  Again and again;
And bring us full many
  Bright days in thy train;
And bid the soft Summer
  Not linger so long:
E'en now we are waiting
  To greet him in song.

8.—A SUMMER MORNING'S SONG.

Up, sleeper! dreamer! up; for now
There's gold upon the mountain's brow—
  There's light on forests, lakes, and meadows—
The dew-drops shine on flow'ret bells,
The village clock of morning tells.
Up, men! out, cattle! for the dells
  And dingles teem with shadows.

Up! to the fields! through shine and shower;
What hath the dull and drowsy hour
  So blest as this? the glad heart leaping
To hear morn's early song sublime;
See earth rejoicing in its prime:
The summer is the waking time,
  The winter time for sleeping.

The very beast that crops the flower
Hath welcome for the dawning hour.
  Aurora smiles! her beck'nings claim thee;
Listen—look round—the chirp, the hum,
Song, low, and bleat—there's nothing dumb—
All love, all life. Come, slumb'rer, come!
  The meanest thing shall shame thee.

THE BEAUTIES OF SUMMER.

The summer! the summer! the exquisite time
Of the red rose's blush and the nightingale's chime;
The chant of the lark, and the boom of the bee,—
The season of brightness, and beauty, and glee!
It is here! it is here! it is lighting again,
With sun-braided smiles, the deep heart of the glen;
It is touching the mountain and tinging the hill,
And dimpling the face of the low-laughing rill;
It is flooding the forest-trees richly with bloom,
And flinging gold showers in the lap of the broom!
I have heard the lark warble his hymn in the sky,
I have seen the dew-tear in the meek daisy's eye;
I have scented the breath of the fresh open'd flowers,
I have plucked a rich garland from bright hawthorn bowers;
My footsteps have been where the violet sleeps,
And where arches of eglantine hang from the steeps;
I have startled the linnet from thickets of shade,
And roused the fleet stag as he basked in the glade;
And my spirit is blithe—as a rivulet clear,
For the summer, the golden crown'd summer is here!

9.—HARVEST HYMN.

Now Autumn strews on every plain
His mellow fruits and fertile grain;
And laughing Plenty, crown'd with sheaves,
With purple grapes, and spreading leaves,

In rich profusion pours around
Her flowing treasures on the ground.
Oh! mark the great, the liberal hand,
That scatters blessings o'er the land;
And to the God of nature raise
The grateful song, the hymn of praise.

The infant corn, in vernal hours,
He nurtured with his gentle showers;
And bade the Summer clouds diffuse
Their balmy store of genial dews.
He mark'd the tender stem arise,
Till ripen'd by the glowing skies;
And now, matured, his work behold,—
The cheering harvest waves in gold!
To nature's God with joy we raise
The grateful song, the hymn of praise.

The valleys echo to the strains
Of blooming maids and village swains—
To Him they tune the lay sincere,
Whose bounty crowns the smiling year.
The sounds from every woodland borne,
The sighing winds that bend the corn,
The yellow fields around proclaim
His mighty, everlasting name!
To nature's God united raise
The grateful song, the hymn of praise.

Hemans.

WINTER SONG.

How deep a sleep hath bound thee!
A snowy shroud is round thee,
  O Earth, our mother fair!
Where now are Spring's gay flowers,
And Summer's golden hours,
  And those green robes thou once didst wear?

How tranquil are thy slumbers!
No shepherd's tuneful numbers
  By vale or stream resound.
Sweet Summer songs are over;
The swallow—joyous rover—
  In all our fields no more is found.

A Father's hand hath dressed thee
In wintry robes; so rest thee
  Beneath his watchful sight:
Thy wintry slumbers breaking,
We soon shall see thee waking
  In radiant robes of lovely light.

SONG FOR ALL SEASONS.

'Tis sweet to walk the fields of Spring,
When first the feathered warblers sing;
When, peeping forth 'mid youthful green,
The modest violets are seen.

Sweet is the breath of Summer morn,
And sweet the sight of golden corn;
And sweet, at evening's closing hour,
The balmy breeze, the fragrant flower.

'Tis sweet, when harvest glories shine,
When glowing clusters load the vine,
When bows the heavy tree, and pours
In Autumn's lap its juicy stores.

'Tis sweet, ay, sweet when Winter's blast
O'er Autumn's fruitful fields hath passed;
Earth folds her snowy mantle round,
And lies in wintry slumbers bound.

To every season, then, we sing,—
Sweet Summer time, and sparkling Spring,
And Autumn rich, and Winter drear:
To grateful hearts they all are dear.

10.—FRUITS AND SEEDS.

FRUITS.

When a flower fades and falls, there is a thick part left on the end of the flower-stem, which holds the seeds of the flower. In many plants this is only large enough to hold the seeds, but in others—as in the case of the currant, the gooseberry, the pear, the apple, the orange—it continues to grow, and becomes filled with a juicy pulp, which soon forms into what we call *fruit*.

When the little flower of the currant falls, it leaves behind on the stem a small round berry. This, as it ripens,

becomes red, white, or black, according to the kind of currant-bush on which it grows. The currant, the gooseberry, the grape, the apple, and most other fruits, have their seeds inside, but the strawberry has its seeds on the outside.

The fruits of some low-growing plants are very large, as the gourd and the melon, so abundant in warm countries; while the fruits of many large trees are very small, as is the case with the walnut and the chestnut. Some of the trees, however, in warm climates, bear very large fruit, as in the case of the cocoa-nut.

The fruits of the earth that are most largely used by man are in the form of seeds; for example, grain, rice, pease, and beans, are all seeds.

Flowers are for beauty, and fruits for use. Our heavenly Father has thus made beauty to go along with what is useful. He smiles upon us in the flowers, but in the fruits he blesses us with his bounty. The flowers are a feast to our eyes, and the fruits are food for our bodies. How endless in their variety are the pleasant things which God has scattered in this world around us; and yet how strange it is that we can know all this, and live on day after day without gratitude to him for his goodness!

SEEDS.

Most plants are raised from seeds; and yet, though this is one of the most wonderful things in nature, few people ever think of it. Gardeners and farmers put seeds into the ground, and they see the plants come up from them; they see also the plants grow and blossom, and after a time they gather the fruit; and yet they never think

there is anything wonderful in all this. How blind man is to the things around him!

After a seed has been in the ground a little while it swells, because the moisture of the earth gets into it. The covering of the seed breaks, and out comes a little root, which pushes down into the ground. Soon after there comes out of the seed a little stalk, which shoots upward. No matter how the seed lies in the ground, the roots will descend even if they come out of the upper end of the seed, and the stalk will go up though it has to come out of the lower end. Now, what makes the root go down and the stalk go up we do not know. "*Lord, how manifold are thy works! in wisdom hast thou made them all.*"

Many seeds, such as those of the peach-tree and the walnut, have thick, hard coverings round them. Such seeds, by being soaked in the ground, gradually swell and burst open, so that the root and the stalk may spring and grow.

A dry seed looks as if it were dead; but there is life in its quiet prison-house. Seeds many hundred years old have been planted, and have been known to grow. A remarkable anecdote of the vitality[1] of seeds is related. In the folds of cloth which the ancient Egyptians used to wrap round the bodies of their dead after embalming them, a few grains of wheat were found by a traveller. The age of the mummy—as such an embalmed body is called—was probably at least from two to three thousand years. The gentleman took care of the seeds and planted them. To his amazement the seeds proved to be alive,

[1] *Vitality*—from the Latin, '*vita*, life.'

and in a short time strong, healthy plants of Egyptian corn made their appearance above the soil. These in due time ripened, and bore fruit abundantly. The seeds were preserved, and afterwards sown again; and these also produced healthy corn. Ultimately enough was obtained to make the seeds an article of sale; and the wheat thus produced became known as "mummy wheat."

What a wonderful subject for thought is this! A sleep of two thousand years! And how remarkably does it illustrate the wisdom and providence of God, who has endowed seeds with this length of life to guard against their ever becoming lost to man.

Seeds do not all rest where they fall. They are scattered in various ways. Some are carried away by water, and settle far from the place where they grew. But the wind is the great scatterer of seeds; and some seeds are so small, and others are so constructed, that the wind can blow them about very easily. The seed of the dandelion is provided with light feathery wings, by which it is easily wafted away. If the seed had not this sort of balloon to fly with, it would fall straight to the ground; but with this it often travels over mountains and across rivers to a great distance.

11.—LEAVES.

LEAVES are so common that we do not observe how beautiful they are. But let us take any common leaf into our hand and examine it,—say the leaf of the strawberry-plant. See how prettily it is notched. Hold it up to the light, and see the lines that run from the middle line to the

edge. Then observe how delicate and beautiful is the fine net-work between these lines. Notice also the back of the leaf, and you will see ribs that spread out from the main rib in the middle to the edge. These form the frame of the leaf, just as timbers are the frame of a house. They are to the leaf what whalebones are to an umbrella. They give strength to it, and without it the leaf would look faded, and hang down. These ribs are very large in broad-spreading leaves, as in those of the vine and the rhubarb-plant; while in leaves that are stiff and firm, like the holly and the laurel, the ribs are very small.

Some leaves are of a very singular shape, and one of the most remarkable is that of the pitcher-plant, a native of China. At the end of the leaf, the main rib extends like a tendril, and to this is attached a little pitcher with a lid on the top. This lid, though it can be raised, is generally shut down. The rain therefore cannot get in, and yet the pitcher is always full of water! Now, how do you suppose this water gets there? It is part of the sap of the plant, and is poured from thousands of little mouths on the inside into the pitcher, which is thus kept filled with water. This plant is quite common in the island of Ceylon, where it is called the monkey-cup, because the monkeys sometimes open the lid and drink the water. Men, too, sometimes drink from these little pitchers, when there is no spring of water at hand where they can quench their thirst.

The leaf of the Venus fly-trap,—a plant which is a native of Canada,—is a real trap for flies and other insects. When undisturbed, it looks as if no danger were there; but let an insect alight on the leaf, and he is made a prisoner at once! The two parts of the leaf close, and

the points on the edges are locked together, so as to furnish bars to the prison.

Most leaves are thin, but some are very thick, as in the case of the India-rubber-tree. The plants called cactuses have thick fleshy leaves, which make them look very awkward; but the flowers are very beautiful. It is a singular fact, that if one of the leaves be broken off and put into the ground, it will take root and grow.

THE SAP IN LEAVES.

Why does a leaf fade when it is plucked from a tree? It is because the sap can no longer get to it; just as no water can get into a house when the water-pipe is cut off. When the leaf is on the tree, the sap flows to all parts of it through the ribs of the leaf; the ribs, like the stem, having innumerable little pipes in them for the sap to run in. But when a leaf is plucked, the watery part of the sap escapes into the air through innumerable little holes or pores on the under surface of the leaf, so small that they cannot be seen without the aid of a powerful microscope. When the ribs and the fine net-work between them have thus lost their supply of sap, the leaf is said to be faded.

The water in the leaf of the pitcher-plant, as already stated, comes from the pores on the inside. If, instead of having a pitcher shape, the leaf were laid open and spread out like a common leaf, the water would all pass away into the air; but the little pitcher, with its curious lid, prevents the moisture from escaping, and is soon quite full. This shows how much water escapes from leaves into the air. If any common leaf could be changed into a pitcher or cup shape, with a lid on it, it would soon

become filled with water, flowing into it from the pores of the leaf.

Leaves may be said to be continually breathing moisture into the air. This moisture helps to make the air soft, and the fragrance of the flowers makes it balmy. Each leaf, it is true, yields but little water, and so does but little good in this way; but there are so many leaves that a large quantity of moisture is continually escaping from them into the air. Those who desire to do good in the world may learn a lesson from the leaves. A large amount of good may be done when each does a little. Let each do all the good he can; and though it may not be noticed by others, God sees it all, and remembers it.

12.—THE USE OF LEAVES.

THE chief use of leaves is to keep plants alive, and to make them grow. If you were to strip off the leaves of a plant as fast as they came out, you would soon kill it. Leaves serve both for digesting food to the plant and for breathing air; the upper surface of the leaf being, as it were, the *stomach* of the plant, and the under surface the *lung*.

No part of the wood of a tree comes from the ground. It all comes from the air. How strange to think that all the vast forests of the earth have been obtained from the air,—that the little particles which unite to form our battle-ships (Old England's wooden walls),—the wood of our houses,—the chairs on which we rest,—the solid floor on which we tread,—were once floating about in the form of air! Yet so it is; the sap of the tree is spread out in

the leaves, and there gets from the air, by innumerable little holes in the leaf, all that forms the wood of the tree.

On one occasion two hundred pounds of dried earth were put into a large earthen vessel, and a willow-tree weighing five pounds was planted in it. During the space of five years the earth was carefully watered, and the willow continued to grow and flourish. At the end of the five years the tree was removed, and, on being weighed, it was found to have increased to one hundred and sixty-nine pounds, without including the weight of the leaves and dead branches that had fallen from it. The earth was also put into the balance, and, strange to say, it weighed only *two ounces* less than it did when the willow was first planted.

It can be clearly shown that the wood of the tree was not produced from the water with which it was refreshed, and that therefore it was derived entirely from the air in which it lived.

The air contains, in small quantities, a heavy gas, called carbonic acid gas; and it is this gas, taken from the air by the leaves, that forms the solid part of trees. This gas is produced by the breathing of man, animals, and birds, and by the burning of wood and coal. When we breathe we make the air bad; and it is this bad air which is so necessary for the growth of plants and trees. We are ever breathing out what plants require; and, strange to say, plants again give back to the air what we require. The part of the air that is poisonous to us is the very life and food of plants and trees!

In the warmer parts of the earth, trees and plants are so abundant, that they give out large quantities of what is required to keep the air in a state fit for man's use; and

a constant system of mixing and circulation is ever going on by the winds which blow over the earth's surface.

In autumn, in cold climates, the leaves of most trees begin to fall; but there are some trees that have always leaves on them. These are called evergreens. In very hot climates, the leaves of trees and bushes are out all the year round. They have no particular time to fall, and some of them remain on the trees for many years, and grow to an immense size.

Before the leaves fall in autumn, many of them become very beautifully coloured; but no one yet understands how this effect is produced, any better than we do how the various colours of the flowers are made. It is a secret which God has not yet permitted man to find out.

13.—AUTUMN LEAVES.

ERE in the northern gale
The summer tresses of the trees are gone,
The woods of autumn, all around our vale,
Have put their glory on.

The mountains that infold,
In their wide sweep, the coloured landscape round,
Seem groups of giant kings in purple and gold,
That guard the enchanted ground

I roam the woods that crown
The upland, where the mingled splendours glow,
Where the gay company of trees look down
On the green fields below.

My steps are not alone
In these bright walks; the sweet south-west, at play,
Flies rustling where the painted leaves are strown
Along the winding way.

And far in heaven, the while,
The sun, that sends the gale to wander here,
Pours out on the fair earth his quiet smile—
The sweetest of the year.

O Autumn! why so soon
Depart the hues that make thy forests glad;
Thy gentle wind and thy fair sunny noon,
And leave thee wild and sad?

Ah! 'twere a lot too blest,
For ever in thy coloured shades to stray;
Amidst the kisses of the soft south-west
To rove and dream for aye;

And leave the vain low strife
That makes men mad, the tug for wealth and power
The passions and the cares that wither life,
And waste its little hour.

14.—BUDS.

LEAVES come from buds just as flowers do. There are therefore leaf-buds and flower-buds. The flower-buds are generally round and short; the leaf-buds are long and pointed. The unfolding of plants is very beautiful and wonderful. The bud swells, the leaves push out; the

flower forms, and then comes the fruit. No one could make all this come from the little bud but God. He only is the maker and upholder of all things.

The buds of trees have brown scales over them. These scales cover up the tender bud from the cold of winter and early spring. They are glued tightly together by a sticky substance, and thus form a close little case for the bud, to protect it from the cold air. When the weather becomes warm enough, the swelling bud pushes the scales apart; and when the leaves are out these scales drop off, because there is no more use for them. In cold climates the buds are always protected in this way by a covering. The buds that we see in spring are not formed in the same year they appear; they are formed in the preceding year, a little while before the leaves begin to fall; and as they form they loosen the old leaves, and soon push them off.

Now in these little buds are locked up all the leaves and flowers that are to come out next spring. The precious treasures of another year are there, and they must be kept safe through the cold winter, and therefore they have tight coverings to guard them from the cold.

These coverings have been called by some one "the winter cradle of the buds;" and an excellent name it is. The little buds in their cradles rock to and fro in the cold winds of winter, and are as safe from harm as the baby in its cradle in its nice warm home, shut in from the wintry blasts. The inside of these cradles is lined with a soft down. This is the bud's little blanket to keep it warm. In warm climates the buds have not these "winter cradles," for there is no need of them. The buds of the orange-tree and the lemon-tree have no coverings.

It is thus God takes care of the tender bud. He always

gives it a covering when it needs one; but in the sunny south he leaves the bud naked to the pleasant warm air. To put a thick covering over it there would do it harm.

15.—WHAT ROOTS ARE FOR.

WHEN a seed sprouts, the root goes down into the ground. The fibres of the root are provided with innumerable little mouths, which suck up what may be called the liquid food of the plant. It is this portion of the plant's food which chiefly forms the soft parts of a plant or a tree,—all the hard wood, as already stated, being derived from the air by means of the leaves. A plant sucks up a large quantity of fluid from the ground; but only a small portion of this is retained within the plant,—the greater part being sent off again into the air from the leaves. Dissolved in the moisture which the roots suck in, are various earthy particles, in very small quantities; and it is a most wonderful thing that different plants have the power to select some substances, and to reject others. Thus, if a grain of wheat and a pea be grown in the same soil, the former will select for itself all the flinty matter which the water it sucks up can dissolve; and the pea will reject this, and will take up whatever particles of lime it can find.

Many plants differ so much from each other, that we should hardly suppose they could grow out of the same earth, side by side; and yet they do. In some countries the strawberry-plant and the pepper-plant may be seen growing together. The fibres of the root of the strawberry-plant suck up what will make strawberries, and the fibres of the pepper-plant select what will make pepper. But

how this is we do not know. God has so made them, and that is all we know about it.

In a previous lesson it was stated that the seed-holder of some plants is larger than it needs to be to hold the seeds of the plant. The pear, the apple, the currant, the gooseberry, &c., answer two purposes: they are fruit to be eaten as well as seed-holders. And so, too, there are roots which are larger than they need be to nourish the plant; and therefore, besides sucking up food for the plant, they also serve as food for animals. In such large roots the little mouths, which suck up the sap from the ground, are not in the body of the root; they are in the little fibres which are joined to the main root. In the root of the turnip there is a kind of tail which goes down into the ground, and the fibres in which the mouths are placed form part of this tail.

In some plants roots are formed in a very curious way. Shoots start out and run along the ground, and after a while these runners, as they are called, send down roots. Strawberry-plants and the beautiful verbenas spread in this way; and when one of their runners gets fairly rooted it can live by itself, for it has a root of its own, and can therefore be separated from the main stem and planted somewhere else.

The roots of dahlias spread out like the fingers of a hand. Each of the fingers can be separated from the rest, and will grow by itself. Other roots form what are called bulbs. The onion, for example, is a bulbous root. If one is cut open, it will be seen to be made up of coats, one inside of the other, which can be peeled off. The roots of hyacinths, lilies, tulips, and crocuses, are all bulbous roots. They lie in the earth very still all through the

winter; but when spring comes, down go the roots from the bottom of the bulbs, and up come the stems from their tops. Some say that a bulb is really a bud, only it is in the ground instead of being in the air, as most buds are. Thus the onion may be said to be a bud, and the real roots of the plant are the fibres we see hanging down from the bottom of the bulb.

Most plants are fixed in the ground, but some grow in water, as is the case with the plant called duckweed, which is found in pools and ditches where the water is stagnant. The leaves float on the surface, and the roots hang down like threads from the leaves, and suck up nourishment for the plant.

16.—STALKS, TRUNKS, BARK, &c.

STALKS AND TRUNKS.

We speak of plants having *stalks*, and of trees having *trunks*. A tree requires a firm, woody trunk, to support its heavy, wide-spreading branches; but the stalks of plants have no wood in them, because they do not need it. Some plants, however, are made strong by containing flinty earth in their stalks,—as is the case with wheat, rye, and most of the grasses; and this flint, which the plant sucks up from the ground, enables the tall stalk of wheat or rye to bend to the wind without breaking. It is this flint in different kinds of straws that fits them to be used for making hats and bonnets; for without it the straw would not be firm enough. The particles of flint, however, are so small, and so mixed up with the fibres of the plant that we cannot see them; yet we know that straw

contains flint: and its ashes, from their fine gritty nature, are found very useful in polishing marble.

Plants that have no wood in their stalks die down to the ground in autumn, though the roots live through the winter. Trees, shrubs, and bushes, remain from year to year,—the firm woody part of the trunks enabling them to last over the winter.

Stalks that cannot stand up of themselves are called climbing or creeping plants,—as the hop-plant, the pea, the vine, the ivy, and many others. Many of these are supported by merely twining round something,—as is the case with the hop-plant. Others, again, are held up by little *tendrils*, which grasp tightly whatever is near them,—as is the case with the pea.

BARK, WOOD, AND PITH.

The trunk of a tree consists of three parts,—the bark, the wood, and the pith. The *bark* consists of two parts,—an outer and an inner bark. The outer bark has no life in it, but serves as a rough coat to protect the living parts of the tree from being injured by the cold of winter. The inner bark is full of the sap from which the wood of the tree is made. Every year a new layer of wood is formed; but this takes place only in the warm weather, for in winter the tree is asleep. By cutting a tree across, and counting the rings or layers of wood, we can tell the age of a tree; but in slow growing trees, the layers are frequently so close together that they cannot be counted.

The *wood* of the trunk and branches is full of small pipes, through which the sap is quietly but constantly flowing, except in the centre, called the *heart-wood*

of the tree. In this the pipes are stopped up, and no sap can pass through them. The *pith* of a tree is a soft and spongy substance, full of little cells. It is the first formed portion of the stem, but gradually gives place to the woody portion as the tree continues to grow.

THE SAP.

Every part of a plant or a tree is made from the sap. The bark, the wood, the leaves, the flowers, the fruit, and the root itself, are all formed from materials which the plant sucks in from the ground and from the air. How strange it is to think that the sharp thorns on a rose-bush are made out of the same sap that forms the soft and beautiful leaves of the rose!

Sometimes both sweet and bitter things are produced from the same sap,—as is seen in the sweet juice and the bitter skin of the orange.

From the sap of the sugar-cane we get sugar. Man does not *make* the sugar. It is made for him by the plant. The juice consists chiefly of water and sugar; and all that man does is to separate the water from the sugar. This is done by boiling the juice and allowing the water to pass off into the air in the form of steam, and then the sugar is left behind. How remarkable it is that the roots and leaves of the cane should be able to suck in from the ground and the air materials out of which it can form sugar! There is no sugar in the ground itself, or in the air; but out of the materials—water from the ground and carbonic acid from the air—the plant produces sugar. Of the way in which this is done, however, no one knows; and man, with all his skill, cannot imitate it.

Besides sugar, there are many other things made by plants out of the materials which form their food. For example, there is *starch* in every kind of grain; and also in potatoes, and in many other roots. Other plants produce medicine; as *camphor*, which is obtained from the bark and wood of the camphor-tree; *opium*, from the seed-vessels of the poppy; and *castor oil*, from the seeds of the castor-oil plant.

Some plants produce gum in great abundance, and others a kind of milky sap, as in the case of the syringe-tree of Cayenne, from which India-rubber or *caouchouc* is obtained. When the bark of one of these trees is wounded the milky sap oozes out and is collected as it flows. It is then dried in smoke, which gives India-rubber its dark appearance.

Many plants produce perfumes. These generally come from the flowers of the plant; but sometimes also the leaves are fragrant, as in the geranium. Even wood is sometimes fragrant, as in the case of the sandal-wood-tree. Other plants are colour makers; and not only make colours for their own flowers, but for man to use, as many of the dyes with which we colour cloths come from plants.

How wonderful it is that bark, wood, leaves, flowers, fruits, thorns, perfumes, colours, starch, gum, medicine, &c., should all be produced from the same sap!

CIRCULATION OF THE SAP.

The sap of a tree ascends from the root to the leaves in one set of pipes; and when it reaches the leaves it turns and goes back again by another set. The pipes by which the sap ascends are in the wood, and those by which it descends are in the live part of the bark. The ascending

sap carries a great deal of water with it; and part of this water, as was stated in a previous lesson, escapes into the air from the pores on the surface of the leaves. The descending sap, thus robbed of part of its water, at the same time receives from the air the materials out of which all the hard wood of the tree is formed.

17.—THE SLEEP AND DEATH OF PLANTS.

When the cold weather comes some plants die and require to be raised again from the seed, while others only go to sleep for the winter.

In winter the branches of a tree are all bare, the sap is all still in the pipes, and the mouths in the little roots have stopped their busy work. The buds all over the tree are asleep in their winter cradles, and the wind rocks them to and fro, but never wakes them. They lie still and quiet till the return of spring; and then, after their long winter sleep, they set to work again, to produce leaves, and flowers, and fruit, as before.

The leaves that fall and the plants that die are not lost—they decay and become part of the earth again; and thus the dead plants and leaves of one year are useful in producing the plants and leaves of the years that follow. How wonderful is this! In summer what a world of varied beauty we see in the trees and flowers! but when autumn comes the leaves and flowers in all their loveliness fade and fall, and the snow of winter covers them as with a winding-sheet. Is it possible that all this beauty which we thus see buried can be revived again? Will the green grass again appear? will the bare trees and shrubs again

be covered with leaves and blossoms? and will the flowers again spring up to delight us with their loveliness? Yes! We have seen God do all this, year after year, with the sunshine, and the rain, and the dew of spring; and He will do it again, for He has said that "seed-time and harvest shall not cease."

Behold the emblem of thy state
In flow'rs that bloom and die,
Or in the shadow's fleeting form,
That mocks the gazer's eye.

Determin'd are the days that fly
Successive o'er thy head;
The number'd hour is on the wing
That lays thee with the dead.

Great God! afflict not in thy wrath
The short allotted span,
That bounds the few and weary days
Of pilgrimage to man.

All nature dies, and lives again:
The flow'r that paints the field,
The trees that crown the mountain's brow,
And boughs and blossoms yield,

Resign the honours of their form
At Winter's stormy blast,
And leave the naked leafless plain
A desolated waste.

Yet soon reviving plants and flow'rs
Anew shall deck the plain;
The woods shall hear the voice of Spring,
And flourish green again.

But man forsakes this earthly scene,
Ah! never to return:
Shall any foll'wing spring revive
The ashes of the urn?

The mighty flood that rolls along
Its torrents to the main,
Can ne'er recall its waters lost
From that abyss again.

So days, and years, and ages past,
Descending down to night,
Can henceforth never more return
Back to the gates of light;

And man, when laid in lonesome grave,
Shall sleep in Death's dark gloom,
Until th' eternal morning wake
The slumbers of the tomb.

O may the grave become to me
The bed of peaceful rest,
Whence I shall gladly rise at length,
And mingle with the blest!

Cheer'd by this hope, with patient mind
I'll wait Heav'n's high decree,
Till the appointed period come,
When death shall set me free.

SPELLING LESSONS

TO PART I.

*** Teachers are strongly recommended to accustom their pupils to divide each word into syllables, and to *pronounce* each syllable slowly and distinctly *before spelling the word;* thus:—Mi'-cro-scope, Up-hol'-ster-er. The advantage of this system will soon be discovered by those who have not hitherto tried it.

I.

Im-part', to give knowledge of.
Lore, learning.
Re-veal', to lay open or disclose, (literally, to lift the veil.)
Myr'-i-ad, ten thousand; used here to mean an immense number.
Count'-less, that cannot be numbered.
In'-fi-nite, without limit; boundless.
Grand'-eur, greatness in power.
Fer'-tile, fruitful.
Fir'-ma-ment, the apparent arch of the sky.
O-ver-whelm', to overpower.
Night'-in-gale, a small bird that sings sweetly at night.
Dif-fus'-ing, spreading widely.
Plen'-te-ous, abundant.
Fo'-li-age, leaves of trees.
Com-pare', (here used as a noun,) comparison.
Par'-a-dise, heaven.
Gar'-land, a wreath of flowers.
Am'-ple, large, wide.
Am'-ber, a beautiful substance of a yellowish colour.
Gleam, to shine with a faint light.
Span, here means the short space of time allotted to man's life on earth and all earthly things.
Re-deem', to buy back. Christ is called the Redeemer, because by his death he bought back his people from the punishment due to sin.

II.

En-joy'-ment, pleasure.
Nur'-ture, to bring up with care.
Flour'-ish, to thrive.
Type, emblem.
Mead'-ow, low grassy land.
Pe-cul'-iar, not shared in by others
Lux'-u-ry, good living.
Med'-i-cine, anything intended to cure disease.
Lo'-tus, a water-plant.
Su-prem'-est, greatest.
Min'-is-ter, to yield or give; to supply.
Beau'-ti-fy, to make beautiful; to adorn.
Whis'-per, to speak with a low voice.

III.

Em-broid'-er-y, ornamental needlework.
Mi'-cro-scope, from two words signifying to see small things; an instrument by which we can see small things.
Del'-i-cate, fine; nice.
Dis-ci'-ple, (literally, a learner or scholar,) a follower.
Ar-rayed', clothed.
Where-with-al', with what.
Right'-eous-ness, the quality of being righteous, or acting according to God's law.
Suf-fi'-cient, enough.
In-struc'-tion, teaching.

Phi-los'-o-phy, (literally, love of wisdom,) explanation of the causes of things.
Whole'-some, healthful.
Car'-ol, a song of joy; to *carol*, to sing.
Guard'-i-an, guarding; watching.
Des'-ti-ny, appointed fate.
Blithe'-ly, in a joyful manner.
Faith'-less, untrusting.

IV.

Pro-duced', made.
Grad'-u-al-ly, by degrees.
Full'-blown, spread out; fully expanded.
Per-mit'-ted, allowed.
Frec'-kle, spot.
Streak, a line of colour; a stripe.
Un-ri'-valled, having no equal.
In-spire', to breathe into.
O'-dour, smell.
Hue, colour.
In-cludes' in grains, poetically, for encloses in seeds.
Ma-jes'-tic, grand; noble.
Twin'-kle, to sparkle.
Prompt, to suggest to the mind.
Re-mem'-brance, the act of remembering.
Pres'-ent, near at hand.
Pe-cul'-iar, one's own; not shared in by others.
Em-bossed', adorned with raised work.
Un-re-strained', loose; free from restraint.
Weath'-er, (literally, to sail to the windward of,) to bear up successfully.
Suc-ces'-sion, a following of things in order.
De-cline', to fail; to decay.
Wreath, to cover with a wreath or garland.
Sul'-try, hot and oppressive.
Per'-fume, sweet scent.
Flow'-er-et, a small flower.
Cul'-tured, tilled; cultivated.
Con'-se-cra-ted, made sacred.
Lamb'-kin, a young lamb.
Un-heed'-ed, not regarded.

V.

Span'-gled, adorned with bright spots.
Dan'-de-li-on, a plant with a yellow flower on a naked stalk.
Shel'-tered, protected.
Prim'-rose, one of the *first* flowers of spring.
Op-por-tu-ni-ty, convenient time or means.
Pro-fu'-sion, great abundance.

VI.

Re-past', a meal.
Nec'-tar, any drink of delicious sweetness.
Es'-sence, substance.
Mead, meadow.
Ob-tain', to get hold of.

VII.

Mes'-sen-ger, one who bears a message.
Ad'-vent, approach.
Yearn, to wish for strongly.
Sul'-len, angry and silent.
Ge'-ni-al, mild; agreeable.
Con'-trasts, changes.
Zone, division of the earth.
Gaunt, lean.
Me-thinks', it seems to me.
Mis'-chiev-ous, making mischief.
Straight'-way, immediately.
Blus'-ter, to be loud and violent.
Gal'-lant, brave.
Chink, a small opening.
Re-bound', bound back.

VIII.

Din'-gle, a quiet and shaded valley.
Drow'-sy, sleepy.
Sub-lime', grand; lofty.
Au-ro'-ra, morning.
Ex'-qui-site, (literally, sought out; hence, highly finished,) exact; perfect.
Sun'-braid-ed, sun-woven.
Eg'-lan-tine, a species of rose; the sweet-brier.

IX.

Ver'-nal, belonging to spring.
Ma-tured', become ripe.
Glow'-ing, shining.
Clus'-ter, a bunch.

X.

Grat'-i-tude, thankfulness.
An'-ec-dote, story.
Re-la'-ted, told.
Vi-tal'-i-ty, life.
A-maze'-ment, surprise and wonder.
Ul'-ti-mate-ly, in the end; at last.

XI.

Ex-am'-ine, to search into with care.
Notched', nicked.
Um-brel'-la, a cover from rain.
Rhu'-barb, a medicinal root.
Lau'-rel, the bay-tree.
Ten'-dril, a slender part of a plant, by which it clings to something for support.
Un-dis-turbed', untouched.
Awk'-ward, wanting grace; clumsy.
Sin'-gu-lar, remarkable.
In-nu'-mer-a-ble, that cannot be numbered.
Con-tin'-u-al-ly, constantly.
Moist'-ure, dampness.

XII.

Di-gest'-ing, dissolving.
Weigh'-ing, having weight.
Re-fresh', to give new strength.
Car-bon'-ic a'-cid gas, a compound of carbon and oxygen.
Poi'-son-ous, destructive.
Cir-cu-la'-tion, a circular motion.

XIII.—XV.

Tress'-es, ringlets.
En-chant'-ed, charmed.
Pre-ced'-ing, going before.
Ver-be'-na, the name of a flower.
Bul'-bous, having round roots.
Hy'-a-cinth, the name of a flower.

XVI., XVII.

Caou'-chouc, India-rubber; the juice of the syringe-tree.
Ge-ra'-ni-um, the name of a flower.
Love'-li-ness, beauty.
Em'-blem, a picture or representation.
Al-lot'-ted, appointed; marked out.
Urn, a kind of vase for the ashes of the dead.
A-byss', a fathomless depth; a gulf.
Lone'-some, lonely.

These Definitions are not full, as in a Dictionary. They give only the meaning of the words as they occur, and should therefore only be used as an exercise in connection with the Lesson.

II.—THE HOUSE WE LIVE IN.

1.—THE BUILDING MATERIAL OF THE BODY.

As the sap may be called the building material of the plant, so the blood is the building material of the body. Everything in the body is made from the blood,—the skin, the hair, the nails, the hard white teeth, the bones, and the muscles. Even the wax in the ears and the tears in the eyes, and the very heart itself, which pumps the blood and sends it through the veins of the body, are all formed from the blood.

The body is the house or habitation of the soul. The bones are its timbers, the skin is its covering, the hair is its thatched roof, and the eyes are its windows. There are also various kinds of machinery in the house, as the machinery for breathing, and the machinery for circulating the blood. But how God makes all these out of the blood of the body no one can tell.

The blood itself is made from the food we eat, very much in the same way as the sap in a plant or a tree is made. As there are little mouths in the leaves and the roots of the plant, to suck in the plant's food: so there are little

mouths in the stomach, which suck up the nourishing part of the food we eat: and the stomachs of all animals have these little mouths.

The food of plants comes from the air and from the ground; and the same may also be said of the food of animals. The bread we eat was once in the air and in the ground, before it formed part of the plant from which it was made; and so also was the meat we eat, before it assumed the shape of the grass which the ox eats.

The substances out of which our food is made all exist in the air and in the ground, but they require to be changed before we can make proper use of them; and it is this which the plants of the earth do for us. We are nourished by what comes from the earth; and when we die, our bodies will become part of the earth again. We can thus see the meaning of that text in the Bible, "*Dust thou art, and unto dust shalt thou return.*"

THE STOMACH.

Before the little mouths in the stomach suck up the nourishing part of the food we eat, the food requires to be digested. A liquid is formed in the stomach that mixes with the food we eat; and when the food thus becomes mixed and changed, the little mouths begin their work upon it. The teeth act as a grinding mill to the food before it passes into the stomach; and the more finely the food is ground by them, the more easily will the digesting fluid act upon it. While the teeth are grinding the food, a fluid is produced in the mouth to moisten it. This fluid is called the *saliva*. Usually only as much of this fluid is produced as is sufficient to keep the mouth moist; but

when we eat, more of it is needed, in order to mix with our food: but how it is that the body thus produces more at one time than at another, we do not know.

Sometimes in fever the mouth is very dry, and this is partly because hardly any saliva is then produced. It would be hard work to eat dry food during a fever; and this is very similar to what sometimes happens to plants when there has been no rain for a long time.

THE TEETH.

Different animals have different kinds of teeth. The lion and the tiger have long, sharp, tearing teeth, because they require to tear their meat to pieces. But the cow has no tearing teeth: the grass she eats does not need to be torn, it requires to be bruised and ground; and for this purpose she has large, broad, grinding teeth—these are her back teeth; her front teeth are shaped for cutting —with these she bites the grass, and with her tongue she passes it back to the grinding teeth. When we eat an apple we do very much as the cow does—we first use our cutting teeth and then our grinding teeth; and though we also eat meat, we do not require long teeth like the cat, the lion, or the tiger, as we do not tear our food to pieces as they do.

Birds have no teeth, the mill for grinding their food being in their stomach. When a hen picks up grains of corn, she swallows them with great rapidity, and passes them into a bag called the *crop*, where they are soaked; and when thoroughly softened, they pass into what is called the *gizzard;* here they are crushed by being rubbed between two hard surfaces, just as corn is ground between two mill-stones. Birds that live on food that does not

need grinding, have a stomach of the ordinary kind, and not a gizzard.

2.—THE CIRCULATION OF THE BLOOD.

As the sap circulates in a plant or a tree, so does the blood circulate in the human body. There is this difference, however, that the blood in the body is kept in motion by a pump which works night and day. This pump is the heart, and whether we are asleep or awake it is ever working steadily on. It makes about 130 strokes every minute in an infant, and from 60 to 70 in a man At every beat in a grown-up man it sends out about two ounces of blood, or more than a gallon a-minute; so that a quantity of blood equal to the whole mass of the living body passes through the heart nearly every three minutes.

In the body there are two sets of pipes for conveying the blood, as there are in the plant for the sap. These pipes of the body are called *arteries* and *veins*. The blood leaves the heart by the arteries, and returns by the veins. At every beat the heart pumps blood out into a large artery, and from this great main pipe other pipes or arteries branch out everywhere to all parts of the body, till, dividing like the branches of a tree, they at last become very small. At the ends of the arteries are little vessels called *capillaries*.* These vessels are in reality smaller than the finest hairs, for they cannot be seen with the naked eye. When the hand or a finger is cut a great many of these vessels are divided, and the blood oozes out from them. They are indeed everywhere, all over the body; so that whatever

* From a Latin word '*capillus*, a hair'

part is pricked with a pin, the blood will ooze out from them. It is the blood in these little vessels that makes the lips red; because there they are very near the surface: and when any one blushes, the redness is caused by these little vessels in the skin of the face becoming full of blood.

As we have said, the blood goes out from the heart by one set of pipes and returns by another set. The return pipes are called *veins*. Some of the veins can be seen, in the hand and in the arm; but we cannot see the arteries. It is comparatively easy to stop the bleeding of a wounded vein, because the blood in it is trickling back slowly and quietly to the heart; but if an artery of any size is wounded it is more difficult to stop the bleeding, because the heart is pumping blood with great force right through it. The large arteries all lie deep in the body, and they are also much stronger than the veins. In this way God has guarded them from danger.

The blood going from the heart in the arteries is bright red, but the blood that comes back to the heart in the veins is of a dark red colour. The blood in the veins has been used in building and repairing bone, skin, muscle, and nerve, and is not fit to be used again till it has been once more converted into bright red blood. As fast as the dark red blood comes to the heart it is sent to the lungs, where it is converted into bright red blood; and then it goes back to the heart, to be sent all over the body. Every time that we draw a breath, air goes down into the lungs, and the oxygen of the air mixes with the blood, and changes it into a bright red colour. The air, thus robbed of one of its parts, becomes bad and unwholesome; and hence it is that we should always have a good supply of fresh air in

our rooms and dwellings, as without this they become unhealthy.

BREATHING.

The heart and the lungs fill up the chest,—the lungs covering up the heart, all except a little part on the left side, where we can feel it beating. The lungs are light, spongy bodies, full of little cells, into which the air we breathe penetrates. It is in these cells that the blood is changed from dark red to a bright red colour.

Fishes have lungs as well as animals,—not exactly like ours, but so formed that they can extract the air which is always found mixed with water. The gills of a fish are its lungs; and the fish, by taking water into its mouth and letting it run through the gills, allows the air that is in the water to mix with the blood of the fish and purify it.

There is a kind of eel which has a row of holes in its neck, seven on each side, leading to its lungs. Insects also have such openings; for instance the grasshopper has twenty-four of them, in four rows. Thus we see that living creatures do not all breathe through their mouths and noses as we do.

The chief use of breathing is to air the blood; but besides this, breathing makes the voice. We could not speak if we did not breathe. The sound of the voice is produced in the top of the neck, in what we call Adam's apple, which is a sort of musical box at the top of the windpipe. In this box are two flat chords stretching right across it; and when we speak or sing, the air coming out of the lungs strikes against these chords and makes them shake or vibrate,—just as the vibration of a fiddle-string makes a sound when the bow is drawn over it, or

as the strings of an Æolian harp are made to sound as they quiver in the wind.

The lowing of the cow, the barking of the dog, and the mewing of a cat, are all produced in a similar way,—the lungs acting as a kind of bellows to the little musical box or organ placed in the throat. Fishes have no such musical box; and even though they had, they could not use it, for the only way in which it can be used is by blowing air through it. The frog cannot make any sound as long as he is under water; he requires to put his head out of the water before he can begin to croak.

3.—THE FIVE GATEWAYS OF KNOWLEDGE.

THE mind has a kind of telegraphic communication with all parts of the body by means of the nerves, and is constantly receiving messages in this way from the sight, the hearing, the touch, the smell, and the taste. The eyes, the ears, the fingers, the nose, and the mouth, may therefore be termed the five gateways of knowledge; and the nerves are the passages by which knowledge is conveyed to the mind in the brain. Some persons have not all these inlets for knowledge. For example, some are deaf; in them no knowledge can enter by the ears: others are blind, and no knowledge can therefore enter their minds by the eyes. In the deaf and dumb, the eyes have to do double duty, and many remarkable instances are on record of the amount of knowledge obtained by individuals afflicted by the loss of these senses. One of the most interesting is that of Dr. Kitto, the celebrated author. When a boy, he fell from the roof of a house, and was taken up insen-

sible; in which state he continued for a fortnight. He describes his first sensation on recovering consciousness as most agonizing. People seemed to talk, but he could not hear them; they wrote on a slate, but did not speak to him. The poor boy became alarmed, and to complete his sufferings, these words were at last put before him, "*You are deaf.*" The sense of hearing was for ever gone. In after life he himself recorded in one of his books the touching fact, that he never heard the voices of any of his children. Nevertheless, from one thing to another this brave-hearted man struggled on. He afterwards travelled in the East, and made such excellent use of the sense of sight still left to him, that he became the author of some of the most valuable books in the English language on subjects connected with Scripture illustration. A much greater amount of knowledge is obtained by means of the eyes than by the ears: it is, therefore, a greater misfortune to be blind than to be deaf; though it frequently happens that deaf people are very irritable, while blind people are cheerful and contented.

4.—THE NERVES.

The nerves, which communicate knowledge to the brain, consist of innumerable very small fibres, extending all over the body. These nerves act like the wires of a telegraph, as by them the mind receives and sends out messages to all parts of the body. When we raise our hand, for instance, a message has been sent from the brain to the muscles of the arm, and causes them to act. If we touch anything, the nerves convey a message to the

brain, and tell whether the substance touched is hard or soft, rough or smooth. When we taste anything, the nerves in the mouth inform the mind whether it is sweet or bitter. So, too, when we see anything or hear anything, the nerves of the eye and the ear convey information to the mind.

All the nerves have their beginning in the brain, and they branch out in all directions to every part of the body. No matter how many messages may be coming to the brain, the mind always knows where a message comes from. It never mistakes a message from a finger for one from a toe, nor even a message from one finger for one from another. And so, too, in sending out messages to the muscles, there is no confusion. If we wish to move the hand or the foot, the message always goes to the right muscles. But how all this is done we cannot tell. It is a secret which God has not yet permitted man to find out.

5.—THE EYE.

THE eye is an instrument of wonderful beauty, constructed with infinite skill, and consisting of a great many different parts.

It is in the form of a globe or ball; and what we term the *white of the eye* forms its outer wall, and consists of a strong thick membrane, something like parchment. In front of this is fixed a beautiful little crystal window, through which light first enters the eye. This window is of a round form, bulging out like a watch-glass, and is called the *cornea*.

Behind this crystal window there floats, in a clear,

transparent liquid, like water, a kind of curtain, called the *iris;* the chief use of which is to regulate the quantity of light that enters the eye. When the light is very bright, this beautiful curtain is drawn together; and when there is little light it is drawn wide open. The iris or curtain is of different colours in different persons. In some it is blue, and then we say the person has blue eyes. In others it is dark, and then we say the person has black eyes.

The circular hole in the middle of the iris is called the *pupil* of the eye. It enlarges as the curtain is drawn open, and becomes smaller when the curtain is drawn together. The pupil of the eye is of different shapes in different animals. In man, it is round. In the cat, it is of this shape.  In the horse, it is shaped in this way. 

The enlarging and lessening, or, as it is termed, the *dilating* and *contracting* of the pupil, can readily be seen in the eye of a cat. In the bright sunlight it becomes a mere narrow slit, like this;  but in the evening it is wide open, and shaped in this way. 

At the back of the iris is a lens, or magnifying-glass, called the *crystalline lens*, through which light passes

into a dark chamber in the back of the eye. On the walls of this chamber an image or picture of everything before the eye is made, just as images of things are reflected on a looking-glass; but with this difference, that the picture in the dark chamber of the eye is very small, —the picture of a landscape, with all its trees, houses, hills, &c., not covering a space larger than a fourpenny piece!

The nerves that come from the brain to the eye are spread out on the walls of the dark chamber where the picture is made, and serve to convey an impression of it to the mind; but in what way this is done no one can tell.

Above the eye are placed the *eyebrows*, which, besides being an ornament to the face, prevent the sweat of the forehead from running down into the eye and irritating it. They may be termed the eaves of the roof of the eye's house.

"The *eyelids* may be compared to a pair of outside shutters for the window of the eye, which we close when we go to sleep, and open when we awake. But these shutters are not useless or merely ornamental through the day. Every moment they are rising and falling, or, as we say, winking. We do this so unceasingly that we forget that we do it at all. But the object of this unconscious winking is a very important one. An outside window gets soiled and dirty, but our eye-windows must never have so much as a speck or a spot on them; and the winking eyelid is the busy apprentice who keeps the living glass clean."[1]

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[1] Professor Wilson.

The *eyelashes*, besides adorning the eye, prevent little particles which may be floating about in the air from getting into it—and if anything does get in, how quickly the tears flow to wash it out! Usually the tear gland or fountain only sends out tears enough to keep the eye a little moist; but as soon as anything gets into the eye and irritates it, the tear fountain flows freely. Tears are always flowing into the eye. If they did not, the eyeball and the inside of the eyelids would become dry, and would not move easily on each other; but the tear fountain, which is just above the eye, continually sends down, through little tubes or ducts, tears enough to make the motion of the eye and the eyelids easy.

These tears are carried off by a duct that ends in the nose. The little openings into it can be seen at that part of the eyelids next the nose. This duct may be called the drain of the eye, for the tears are carried off through it after washing the eye. The two little holes or mouths in the lids usually carry off all the tears as fast as they come; but when we cry, the tear fountain flows so freely that the little drains cannot carry them away fast enough: and the tears, therefore, overflow and run down on the cheek.

ON A TEAR.

O that the chemist's magic art
  Could crystallize this sacred treasure!
Long should it glitter near my heart,
  A secret source of pensive pleasure.

The little brilliant, ere it fell,
  Its lustre caught from Chloe's eye;

Then, trembling, left its coral cell—
The spring of sensibility.

Sweet drop of pure and pearly light!
In thee the rays of virtue shine;
More calmly clear, more mildly bright,
Than any gem that gilds the mine.

Benign restorer of the soul,
Who ever flies to bring relief,
When first we feel the rude control
Of love or pity, joy or grief.

The sage's and the poet's theme,
In ev'ry clime, in ev'ry age;
Thou charm'st in fancy's idle dream,
In reason's philosophic page.

That very law that moulds a tear,
And bids it trickle from its source,
That law preserves the earth a sphere,
And guides the planets in their course.

Rogers.

6.—HEARING.

As the eye is constructed to collect rays of light from all directions, so the ear in like manner collects the rays or waves of sound.

What is sound? Sound is caused by vibrations in the air. If we put our hand on a large bell when it is struck, we can feel it quivering or shaking. This quivering gives motion to the air, which moves forward with great rapidity in little waves, and striking against the ear produces what we call sound. The farther sound tra-

vels the fainter it becomes,—that is, the vibration in the air becomes less and less till it entirely dies away; just as when a stone is dropped into water, the little waves or ripples caused by it become less and less the farther they go from the place where the stone was dropped. But though sound thus naturally spreads out in all directions, if confined within a speaking-tube it will move straight forward through the tube, and the faintest whisper can thus be heard at a great distance.

Sometimes the vibration in the air strikes against a wall, or a house, or some other thing, and then bounds back like a wave striking against a rock. A sound thus sent back is called an echo.

The external ear is spread out so as to catch the waves of sound, and there is a tube by which the vibrations pass inwards to the internal ear. They first strike against a membrane stretched across the ear-tube, and then from it are conveyed by a chain of little bones, four in number, to another membrane which covers an opening to some winding passages filled with a watery fluid.

All this takes place every time we hear a sound. First the bell, or whatever it is that makes the sound, vibrates or shakes,—then the air vibrates,—this again causes the drum of the ear to vibrate,—then the chain of bones, then the second drum, and lastly the watery fluid in the bony passages of the internal ear.

The nerve of hearing has its fine delicate fibres in these passages, and as it is necessary that this part of the ear should be well guarded, they are enclosed in the very hardest bone in the body. The watery fluid being made to vibrate, the sensation of sound is thus produced, and is carried to the brain.

Every vibration goes by itself, but one may follow another so rapidly as to appear to make one continued sound. For example, every puff of a locomotive engine, when a train starts, is heard by itself. The vibration of one puff strikes against the drum of the ear before the one that follows it, but as the locomotive goes on, the puffs get quicker and quicker, till at last they appear to make one continued sound.

The faculty of hearing, like that of sight, may be very much increased by training. Thus, the watchful North American Indian easily recognises the sound of footsteps, and can even distinguish between the tread of friends and foes; while one accustomed to the busy hum of cities, if standing by his side, would be unconscious of the slightest sound.

Persons who are deaf sometimes use what is called an ear-trumpet, the wide end of which they turn toward the person speaking to them, so as to catch the vibrations of sound, and convey them into the ear.

The ears of some animals, such as the long-eared bat, are very large. Others have the power of turning the ear in different directions. This is especially the case in such timorous creatures as the hare, the rabbit, and the deer, which are constantly on the watch for danger, and turn their ears in the direction of the faintest sound.

7.—THE SMELL, THE TASTE, AND THE TOUCH.

In the lining of the nose are spread out the fine ends of the nerve of smell.

Smell is caused by very little particles of various substances floating about in the air, and going into the nostrils with the air we breathe. These little particles must be extremely small, for the substances from which they come do not seem to lose weight. For example, a grain of musk has been known to give off scent for a period of ten years, and yet at the end of that time it was found not to be perceptibly diminished in weight! The pleasant fragrance of the rose, and every other perfume, are caused by such little particles coming in contact with the nerve of smell. God has in his goodness, for the purpose of gratifying us, scattered sweet-smelling flowers all over the earth. There are, it is true, unpleasant smells in the world; but many of them are manifestly very useful in warning us of danger. For example, the unpleasant odour caused by filth and decay tells us where these causes of disease are, so that we may get rid of them.

Some animals have a much more acute sense of smell than man. The extreme delicacy of this sense in the deer, antelope, and other such animals, is well known; and hunters find it difficult to get near enough to attack them, except by stealing upon them in the direction contrary to that of the wind.

TASTE.

The sense of taste is another source of gratification to us. The nerve of this sense has its fine ends mostly in the tongue, and whatever we take into the mouth comes in contact with these nerves. Besides the pleasure we derive from the taste, the great use of this sense is to guide us in the choice of food.

TOUCH.

The sense of touch has a large number of nerves in all parts of the body, continually carrying messages to the brain. These nerves are not, as might be supposed, on the surface of the skin. The body has in reality two skins, an outer and an inner skin. The outer skin merely serves as a covering to the real skin which lies underneath; and in this the nerves of touch are placed. Were it not for this outer skin, we would always be in pain, for the delicate nerves of touch could not even bear coming in contact with the air.

In the tips of the fingers the outer skin is very thin; and therefore the sense of touch in that part of the hand is extremely delicate.

No animals have such perfect instruments of touch as the fingers of the human hand. In the hoof of the horse, or the paw of the dog, there is no delicate sense of touch. Animals have their sense of touch mostly in their lips and tongues. The elephant has this sense chiefly in the finger-shaped end of his trunk. In the cat, the whiskers act as feelers, there being delicate nerves of touch at the root of each of the long hairs. Some insects have feelers extending from their heads, and we often see them touching things with their feelers as we do with our hands.

8.—THE FRAMEWORK OF THE HOUSE WE LIVE IN.

THE bones are the framework of the house we live in. They are to the body what timbers are to a building.

Those of the lower extremities may be called the pillars of the house. They are commonly reckoned in three divisions: the thigh, the leg, and the foot.

The *thigh* is the longest bone in the human body. Its lower part is joined to the bone of the leg, and where the two meet they form what is called a *hinge joint;* which means a joint that will only allow of motion backwards and forwards in one direction, like a door on hinges.

The *foot* consists of twenty-six little bones, so bound together by strong, tough ligaments, as to form an arch. When we walk or run, this arch yields like a spring to the surface on which we tread. If the foot consisted only of one solid bone, it would entirely want its spring or elasticity, and we would stump about with a heavy, hard sound, similar to that made by the hoof of a horse. In standing, we rest only on the heel and the fore part of the foot, the arch between forming a hollow which serves to lodge and protect the vessels and nerves that descend from the leg to the toes.

A chain or column of twenty-four bones, placed one above the other, form what is called the *spine* or backbone of the body. When we make a bow, there is a little motion between each two of the whole twenty-four bones; and this makes the motion easy and graceful. Were the spine all one bone, the movement of the body would be stiff and ungraceful. On the top of this column of bones rests the head, in which is placed the brain, the central abode of the soul. In the ivory palace of the skull are placed the four principal gateways of knowledge,—the eye, the ear, the nose, and the mouth.

A set of ribs, or bones like the hoops of a barrel, form the framework of the chest. There are twelve of these

ribs on each side of the body, all joined at the back to the spine. Seven of them on each side are also joined in front to the breast-bone, which is about half the length of the spine. A strong gristly substance stretches down from each of the seventh ribs, and joins together the other five ribs.

The upper part of the arm consists of only one bone. The head of it is a smooth, round ball, which fits into a kind of cup in the shoulder-bone. This cup is called a socket, and the whole joint is termed a ball-and-socket joint. The ball turns in the socket, so that we can not only make the arm move backwards and forwards, but can give it also a whirling motion.

The joint at the elbow is of a different kind. It is like that of the knee, a hinge joint, and can only move backwards and forwards.

Below the elbow the arm consists of two bones, which roll on each other in such a way that the palm of the hand can be turned in different directions. At the *wrist* the chief motion is a hinge motion.

The hand possesses a large number of bones; eight in the *wrist*, five in the *palm*, and fourteen in the *fingers*—each finger possessing three, except the thumb, which has only two.

The teeth do not grow like the other bones. When once fully formed, the passage of vessels and nerves to the teeth is almost closed; so that when a tooth is broken or decayed it does not possess the power of repairing itself. Still, however, its root, or fang, is penetrated by a small nerve; and it is to the action of the air on this nerve that the pain of toothache is chiefly due.

As the jaw-bone of a child enlarges, the teeth become

too small to fill it; and this is the reason that we have two sets of teeth. The first set begin to remove about the seventh year, and a new set take their place. The new teeth are not only larger, but more in number, and they fill up all the room designed for them in the enlarged jaws.

All the bones of our bodies are inside, and are covered with muscles, cords, and ligaments, and over all is the skin. But the bones of some animals are on the outside, as in the case of crabs and lobsters. Their bones make a kind of coat of mail, to protect the soft parts from being injured. Such animals have new skeletons every year. They crawl into a retired place, and gradually the shell comes apart, and the animal pulls himself out of it. Another case or skeleton is soon formed, and the animal comes forth again with his new armour on, as brave and ready to fight as ever.

9.—WHAT IS BONE MADE OF?

Bone consists of both mineral and animal matter. By soaking a bone in muriatic acid all the earthy matter can be removed; and then the bone becomes soft and pliable. Again, by subjecting a bone to a strong heat the animal portion will be burnt out, and the earthy matter will remain; but the earthy particles adhere so slightly together that the least touch will break them. Thus we see that the *hardness* of bone is given by the earthy matter, while its *tenacity*, or toughness, depends on the animal portion. The bones of an old person have less animal matter, and therefore are more brittle, than those of the young.

When we examine a section of a bone through a microscope, we find it traversed by a network of minute canals, through which nourishment is conveyed to the bone precisely as sap spreads to the different parts of a tree.

10.—THE MUSCLES.

THE muscles are the fleshy part of the body. Besides giving roundness and beauty to the human form, they possess the power of shrinking and lengthening like a piece of India-rubber. Attached to them are strong white cords called *sinews* or *tendons*, the ends of which are fastened to the bones. When the muscles contract they pull these tendons, and thus give motion to the different parts of the body. For example, if I wish to bring my hand to my head, the muscles on my arm between the shoulder and the elbow immediately shrink and pull up the forearm. When I wish my hand to go back, another set of muscles on the back part of the arm contract, and straighten out the arm again. The muscles are usually thus found in pairs, one set to bend a limb, another to straighten it. The whole body contains about four hundred and fifty muscles, or two hundred and twenty-five pairs, the uses of which have been ascertained. By these muscles all the motions of the body are performed. The bones could not move without them, and any part unfurnished with suitable muscles would be motionless. The bones and the muscles are thus necessary to each other; and their union displays the wisdom and goodness of Him who is the maker and framer of our bodies.

There are about one hundred and fifty muscles concerned

in keeping the body in an erect posture, and about two hundred are employed in the act of walking.

In order to travel a distance of thirty miles, each lower limb must be moved about forty thousand times, or both of them eighty thousand times. The arms in swinging at the sides move as often, so that the motions of the lower limbs and the arms thus amount together to one hundred and sixty thousand. This number, multiplied by the two hundred muscles which are brought into action at every step, gives a product equal to thirty-two millions of motions performed in walking a distance of thirty miles. How marvellous that the human body is so constituted that it can perform all these thirty-two millions of muscular actions, or motions, without injury! No iron or steel could endure such a vast amount of work as the joints of the human body thus do.

It is said that not less than a hundred muscles are employed every time we breathe; yet we draw our breath every moment without considering, or even being sensible of, the vast and complicated apparatus that is necessary to effect this. The least impediment to our breathing throws us into the greatest distress; but how little do we value this inestimable blessing till disease or accident makes us sensible of its enjoyment.

Besides the muscles which move the bones, there are muscles which give motion to other parts of the body. For example, all the variety of expression in the human face is produced by the movement of a few muscles. When we smile or laugh, these expressions are produced by the movements of certain muscles in the face. In smiling, the corners of the mouth are slightly drawn up; in laughing, still more so. There are also muscles to pull

down the corners of the mouth; and it is by these that the expression of sadness is given to the face. The expression of pouting is caused by the movement of a muscle which pushes out the under lip; and anger or scowling, by muscles which knit the brows. In many people these muscles are in very frequent use.

11.—THE HAND.

THE hand is one of the most wonderful parts of the human frame, displaying in its beautiful mechanism the infinite skill of the divine Creator.

"What will the hand not do? what has it not done for man? Put a sword into it, and it will fight for him; put a plough into it, and it will till for him; put a harp into it, and it will play for him; put a pencil into it, and it will paint for him; put a pen into it, and it will speak for him, plead for him, pray for him." There is no implement it cannot wield, no work it cannot perform. See the blacksmith wielding his heavy hammer—how firmly his hand and fingers grasp the handle! and yet these same fingers can be trained to do work of the finest and lightest kind. No human being ever made, or could make, a machine capable of doing even the most common things that the hand can perform. Watch any one as he is buttoning his coat, and see how easily the fingers do it; yet simple as the operation is, man with all his skill could not make a machine to do this for him. What hinge could the most skilful workman contrive that could be used as often as the joints of the fingers are, and for so long a period as the life of man, without being

disordered or worn out? Have not we here a strong proof of the vast superiority of the works of God to the most ingenious contrivances of man?

The hand, however, is not merely a machine for performing motions. It is one of the principal gateways of knowledge, as by the sense of touch, of which the hand is the chief organ, messages are continually passing from it to the brain, by the delicate nerves which lie in the tips of the fingers.

One of the most remarkable arrangements in the mechanism of the hand is the position of the muscles which give motion to it. There are some small muscles in the hand, that perform the lighter movements of the fingers; but the muscles that enable us to grasp things tightly, or to perform any work requiring strength, are in the arm, and from this position they act upon the fingers by means of long tendons or strings resembling wires. These tendons are bound down at the wrist by strong bands, beneath which they pass to the fingers. If the muscles had been placed in the palm or the back of the hand, they would have been liable to injury, and would have made the hand clumsy and inconvenient. The same beautiful arrangement is observed in the muscles that give motion to the toes and many of the joints of the foot. Instead of swelling and distorting the foot, they are placed at a distance in the leg. Surely no one can be acquainted with the skill and wisdom so wonderfully displayed in the structure of the human body without acknowledging that none but God could have produced anything so beautiful and so perfect!

12.—SLEEP AND DEATH.

SLEEP.

When we sleep the muscles stop working, no messages pass through the nerves, and the brain is at rest. Were it not for this, the machinery of the body would soon wear out; but during sleep, the brain, the nerves, and the muscles are all repaired, that they may be ready for use again. Mere rest from motion would be sufficient to repair the muscles, but sleep is needed to repair the brain and the nerves. When we dream, we do not feel so refreshed as when we sleep soundly. This is because the mind is not wholly at rest; but in perfect sleep the action of the senses appears for the time to be wholly suspended.

During sleep the heart and lungs do not cease to work. They seem to require no rest. The heart steadily does its appointed work, sending the blood to all parts of the body to repair its machinery; and the breathing continues to keep the blood in order; while man, sunk in sleep, is unconscious of the silent work that is ever going on within his frame.

Many animals sleep all winter, as is the case with frogs, bats, flies, and spiders. They retire into their hiding-places in the autumn, and remain there till the warmth of spring wakes them from their winter sleep.

There are some animals that go into winter quarters though theirs is not wholly a death-like sleep, like that of the frog; and it is remarkable that such animals always lay beside them something to eat. The field mouse lays up nuts and grain when it goes into its winter quarters

and when it is partly awakened by a warm day during the winter it eats a little of its store.

How much life, then, is asleep during winter in animals as well as in plants! and how busy are both animal life and vegetable life again in the spring! When the roots and seeds in the ground send up their shoots, and the sap again circulates in the trees and shrubs, and the buds swell, multitudes of animals are crawling out of their winter hiding-places into the warm, balmy air. And when the leaves are fully out, and the flowers abound, the earth swarms with busy insects, and birds, and creeping things, of which we saw none during the long winter.

DEATH.

Like the leaves, and flowers, and plants, all animals, when they die, become part of the earth again. The earth is the mother of all living things; and yet most of the ground on which we tread once formed part of plants that grew and animals that lived on its surface. The change from life to death is ever going on; but, by the power of God's power, new plants and animals are continually brought forth and sustained.

There is one grand difference between the death of animals and that of man. Though man's body decays in the earth, his soul continues to live; and a time will come when body and spirit will be united again, to live through all eternity, either in a state of perfect blessedness or of endless misery. May we so live here, that, with glorified bodies and higher powers, we may serve God for ever in heaven!

13.—DEATH'S SEASONS.

Leaves have their time to fall,
And flowers to wither at the North-wind's breath,
And stars to set—but all,
Thou hast *all* seasons for thine own, O Death!

Day is for mortal care,
Eve for glad meetings round the joyous hearth,
Night for the dreams of sleep, the voice of prayer;
But all for thee, thou Mightiest of the Earth!

The banquet hath its hour,
Its feverish hour of mirth, and song, and wine;
There comes a day for grief's o'erwhelming power,
A time for softer tears—but all are thine!

Youth and the opening rose
May look like things too glorious for decay,
And smile at thee! but thou art not of those
That wait the ripened bloom to seize their prey!

Leaves have their time to fall,
And flowers to wither at the North-wind's breath,
And stars to set—but all,
Thou hast *all* seasons for thine own, O Death!

We know when moons shall wane,
When summer-birds from far shall cross the sea,
When autumn's hue shall tinge the golden grain;
But who shall teach us when to look for thee?

Is it when spring's first gale
Comes forth to whisper where the violets lie?
Is it when roses in our paths grow pale?
They have *one* season—*all* are ours to die!

Thou art where billows foam,
Thou art where music melts upon the air;
Thou art around us in our peaceful home,
And the world calls us forth—and thou art there.

Thou art where friend meets friend,
Beneath the shadow of the elm to rest;
Thou art where foe meets foe, and trumpets rend
The skies, and swords beat down the princely crest.

Leaves have their time to fall,
And flowers to wither at the North-wind's breath,
And stars to set—but all,
Thou hast *all* seasons for thine own, O Death!

Hemans.

14.—HUMAN LIFE.

"WHAT is the gift of Life?"
Speak thou, in young existence revelling:
To thee it is a glorious, god-like thing;
Love, Hope, and Fancy, lead the joyous way;
Ambition kindles up her living ray.
There is a path of light marked out for thee,
A thornless path, and there thy way shall be!
A thousand spirits by thy side shall fall,
But thou shalt live and look behind them all!
Yes, Life indeed may seem a joyous thing.
"What is the gift of Life"
To thee, subdued and taught by Wisdom's voice,

Wisdom of stern necessity, not choice;
Whose cup of joy is ebbing out in haste,
Who hast no fountain to supply the waste;
Whose spirit, like some traveller gazing round
On broken columns in the desert ground,
Sees but sad traces on a lonely scene
Of what Life was, and what it might have been;—
Oh! is not Life a sad and solemn thing?
"What is the gift of Life"
To him who reads with heaven-instructed eye?
'Tis the first dawning of eternity;
The future heaven just breaking on the sight;
The glimmering of a still increasing light;
Its cheering scenes foretastes of heavenly joy;
Its storms and tempests sent to purify:
Oh! is not Life a bright, inspiring thing?
"What is the gift of Life"
To him whose soul through this tempestuous road
Hath pass'd, and found its home, its heaven, its God;
Who sees the boundless page of knowledge spread,
And years as boundless, rolling o'er his head;
No cloud to darken the celestial light;
No sin to sully, and no grief to blight;—
Is not that better life a glorious thing?

Emily Taylor.

15.—ON TIME.

Time's an hand-breadth; 'tis a tale;
'Tis a vessel under sail;
'Tis an eagle in its way,
Darting down upon its prey;

'Tis an arrow in its flight,
Mocking the pursuing sight;
'Tis a short-liv'd, fading flow'r;
'Tis a rainbow on a show'r;
'Tis a momentary ray,
Smiling in a winter's day;
'Tis a torrent's rapid stream;
'Tis a shadow; 'tis a dream;
'Tis the closing watch of night,
Dying at the rising light;
'Tis a bubble; 'tis a sigh;—
Be prepar'd, O man, to die.

Quarles.

HEAVEN.

THIS world is all a fleeting show
For man's illusion given;
The smiles of joy, the tears of woe,
Deceitful shine, deceitful flow:
There's nothing true but heaven!

And false the light on glory's plume,
As fading hues of even;
And love, and hope, and beauty's bloom,
Are blossoms gather'd from the tomb;
There's nothing bright but heaven!

Poor wanderers of a stormy day,
From wave to wave we're driven;
And fancy's flash, and reason's ray,
Serve but to light the troubled way:
There's nothing calm but heaven!

Moore

SPELLING LESSONS

TO PART II.

I.

Ma-te'-ri-al, the matter or substance of which anything is made.
Mus'-cles, the fleshy part of the body.
Hab-i-ta'-tion, dwelling; abode.
Ma-chin'-er-y, things put together for producing motion.
Stom'-ach, the organ of digestion.
As-sume', to take.
Sub'-stance, matter.
Re-quire', need.
Nour'-ish-ing, strength-giving.
Di-gest'-ing, dissolving.
Moist'-en, to make damp; to wet.
Sa-li'-va, spittle.
Bruise, to crush.
Thor'-ough-ly, completely; fully.
Or'-di-na-ry, common.

II.

Cir'-cu-late, to flow; to move round.
Dif'-fer-ence, distinction.
Stead'-i-ly, regularly.
Quan'-ti-ty, portion.
Con-vey'-ing, carrying.
Ar'-te-ries, vessels in which the blood from the heart is carried to all parts of the body.
Veins, vessels in which the blood is carried back to the heart from the arteries.
Cap'-il-la-ry, like a hair.
Com-par'-a-tive-ly, by way of comparison.
Re-pair'-ing, mending.
Con-vert'-ed, changed.
Ox'-y-gen, a gas which forms the life-supporting part of the air.
Un-whole'-some, not healthy.
Pen'-e-trate, to enter into.
Mu'-si-cal, producing music.
Vi-bra'-tion, a quivering.
Æ-o'-li-an harp, a harp played upon by the wind.

III.

Tel-e-graph'-ic Com-mu-ni-ca'-tion, means of getting and sending messages very quickly.
Re-ceiv'-ing, getting.
Knowl'-edge, what we know.
In-di-vid'-u-als, persons.
Af-flict'-ed, suffering trouble.
In-sen'-si-ble, without feeling.
Sen-sa'-tion, feeling.
Con'-scious-ness, the knowledge of what passes in the mind.
A-gon-iz'-ing, causing extreme pain
Trav'-el-led, made a journey.
Ex'-cel-lent, very good.
Il-lus-tra'-tion, explanation.
Ir'-ri-ta-ble, easily provoked.
Cheer'-ful, lively; in good spirits.

IV.

Com-mu'-ni-cate, carry; convey.
Con-fu'-sion, disorder.
Per-mit'-ted, allowed; given leave

V.

In'-stru-ment, that with which any work is done.
Con-struc'-ted, put together.
Parch'-ment, the skin of a sheep or a goat prepared for writing on.
Crys'-tal, a fine kind of glass.
Trans-pa'-rent, easily seen through.
Cur'-tain, veil.
Cir'-cu-lar, round.
Di-lat'-ing, spreading out.

Con-tract'-ing, drawing together.
Mag'-ni-fy-ing, making larger.
Crys'-tal-line, like crystal.
Re-flect'-ed, thrown back.
Land'-scape, a view of a portion of land.
Im-pres'-sion, an image or mark, as of a seal on wax.
Un-con'-scious, not knowing.
Ap-pren'-tice, one bound to another to learn a trade or art.
Foun'-tain, a spring or source.
Con-tin'-u-al-ly, constantly.
Crys'-tal-lize, to form into crystals.
Pen'-sive, thoughtful; sad.
Brill'-iant, diamond.
Sen-si-bil'-i-ty, fine feeling.
Be-nign', kind.
Re-lief', ease from pain.
Con-trol', authority.
Sage, a wise man.
Theme, subject on which one writes or speaks.
Phil-o-soph'-ic, devoted to wisdom.
Sphere, a globe.

VI.

Ra-pid'-i-ty, speed.
Fur'-ther, more distant.
Rip'-ple, a little wave.
Nat'-u-ral-ly, according to nature.
Straight, not crooked.
Ech'-o, a sound sent back.
Ex-ter'-nal, outside.
In-ter'-nal, inside.
Del'-i-cate, slender.
Sen-sa'-tion, impression on the mind.
Con-tin'-ued, unbroken.
Lo-co-mo'-tive, having power to move; a self-moving engine.
Fac'-ul-ty, power.
In-creased', made stronger.
Rec'-og-nise, to know again.
Dis-tin'-guish, to note as different.
Ac-cus'-tomed, familiar with.
Es-pe'-cial-ly, particularly
Tim'-or-ous, fearful of danger.

VII.

Per-cep'-ti-bly, so as to be perceived.
Con'-tact, touch.
Grat-i-fy'-ing, pleasing
Un-pleas'-ant, disagreeable.
Del'-i-ca-cy, fineness.
An'-te-lope, a kind of animal between a goat and a deer.
Source, that from which a thing springs.
Grat-i-fi-ca'-tion, pleasure.
Guide, to show the way; to conduct.
Sur'-face, the outside.
El'-e-phant, the largest of quadrupeds (literally, the long-toothed animal).
Ex-tend'-ing, spreading out.

VIII.

Build'-ing, house.
Ex-trem'-i-ty, the end.
Reck'-oned, counted.
Lig'-a-ment, anything that binds; a bond.
E-las-tic'-i-ty, spring.
De'-scend, go down.
Un-grace'-ful, awkward.
Prin'-ci-pal, chief.
Bar'-rel, a cask.
Shoul'-der, the joint that unites the arm with the body.
Tooth'-ache, a pain in the teeth.
Skel'-e-ton, the bones of an animal.
Grad'-u-al-ly, step by step.
Ar'-mour, defensive covering.

IX.

Min'-er-al, earthy.
Mu-ri-at'-ic, having the nature of salt water.
Pli'-a-ble, easily bent.
Sub-ject'-ing, submitting.
Ad'-here, to stick to.
Te-nac'-i-ty, toughness; power of adhering together.
Brit'-tle, easily broken.
Trav'-ersed, crossed.
Pre-cise'-ly, exactly.

X.

Length'-en, to increase length.
Fore'-arm, the part of the arm from the elbow to the wrist.
Straight'-en, to make straight.
As-cer-tained', made certain; found out.

Un-fur'-nished, not provided with.
Suit'-a-ble, fitting.
Mo'-tion-less, without motion.
Con-cerned', taking part in.
Mar'-vel-lous, wonderful.
In'-ju-ry, hurt.
Con-sid'-er-ing, thinking.
Sen'-si-ble, able to perceive.
Com'-pli-ca-ted, consisting of many parts; intricate.
Im-ped'-i-ment, stoppage; obstruction.
In-es'-ti-ma-ble, that cannot be estimated; beyond value.
Dis-ease', sickness.
Ac'-ci-dent (literally, that which happens), a chance event.
Ex-pres'-sion, sign of thought.

XI.

Plough, an instrument for cutting the ground.
Wield, use.
Ca'-pa-ble, able to do; possessing power.
Op-er-a'-tion, work.
Dis-or'-dered, put out of order.
Su-pe-ri-or'-i-ty, the quality of being better or above others.
In-gen'-ious, skilful.
Pos-i'-tion, place.
Re-quir'-ing, needing.
Re-sem'-bling, like.
Li'-a-ble, subject to.
In-con-ven'-ient, difficult to use.
Dis-tort'-ing, twisting.
Ac-quaint'-ed, familiar with.
Ac-knowl'-edg-ing, owning; admitting.

XII.

Sus-pend'-ed, stopped.
Sus-tained', held up; supported.
Glo'-ri-fied, made glorious.

XIII.

Mor'-tal, human; subject to death.
Joy'-ous, full of joy.
Ban'-quet, a feast.
Fe'-ver-ish, exciting.
Rev'-el-ling, giving up one's self t. pleasure.
Am-bi'-tion, eager desire for superiority.
Sub-dued', brought under; overcome.
Ne-ces'-si-ty, that which must be.
Sol'-emn, serious.
Glim'-mer-ing, a faint light.
Fore'-taste, a taste beforehand.
Pu'-ri-fy, to make pure.
In-spir'-ing, giving spirit; exciting.
Tem-pest'-u-ous, stormy.
Ce-les'-tial, heavenly.
Sul'-ly, stain.
Blight, wither.
Mo'-ment-a-ry, lasting only a moment.
Fleet'-ing, passing rapidly away.
Il-lu'-sion, false show.
De-ceit'-ful, cheating.

III.—THE ANIMAL KINGDOM.

1.—THE SMALLEST LIVING CREATURE.

THE smallest living creature revealed to us by the microscope is the *twilight monad.* "It consists of a simple cell of transparent matter, furnished with a single cilium, or very minute hair, by the lashing action of which it rows itself through the water." No words can convey an adequate idea of the size of this tiny speck of created life. A single drop of water would be large enough to contain a thousand millions of them, or more than the globe itself contains of human beings.

The largest animal known is the Rorqual whale, which is frequently found a hundred feet in length; and the common house-fly is as much smaller than it, as the twilight monad is smaller than the house-fly. The house-fly may, therefore, be said to occupy the middle place in creation, there being animals as much larger as there are animals smaller than it.

Even in such a minute atom of life as the monad we can see the hand of God. He is the creator and preserver of all; and the smallest as well as the greatest of his works alike display his infinite wisdom and power. The stars, or suns of other worlds, revealed to us by the telescope, are not more wonderful than that world, as boundless in

its very minuteness, revealed to us by the microscope. In the smallest as well as the greatest of God's works we recognise the hand of Him by whom the heavens were created and the foundations of the earth laid.

"The telescope," says Dr. Chalmers, "leads me to see a system in every star; the microscope leads me to see a world in every atom. The one teaches me that this mighty globe, with the whole burden of its people and of its countries, is but a grain of sand on the high field of immensity; the other teaches me that every grain of sand may harbour within it the tribes and the families of a busy population. The one tells me of the insignificance of the world I tread upon; the other redeems it from all its insignificance, for it tells that in the leaves of every forest, and in the flowers of every garden, and in the waters of every rivulet, there are worlds teeming with life, and numberless as are the glories of the firmament."

2.—THE SPONGE.

THE variety in the forms of living creatures, and in the mechanism of their different parts, is almost endless; yet all are suited to the way in which they live, and they show forth the power, the wisdom, the skill, and the goodness of Him who made all things for his own glory, and who rejoiceth in the works of his hands. He has given to each of his creatures exactly such a body and such machinery as its life requires. Birds are made to fly, fish to swim, while other creatures, like the oyster and the sponge, never move from the place in which they live.

For a long time the sponge was ranked among the plants of the sea, but its claims to a place in the animal kingdom have now been definitely settled. It is one of the lowest forms of animal life.

The general structure of the common sponge is well known. It consists of a framework of porous, elastic fibres. These, however, form only the skeleton of the animal,—the framework which in life supported the softer flesh. When the animal is in a living state the skeleton is covered with a transparent jelly-like flesh, so soft that it drains away when the sponge is taken out of the water. The fibres of the skeleton contain innumerable pores, through which water is drawn in from without, and sent through the whole mass of the animal by a system of tubes which run through its entire body. These terminate in a number of openings, or vents, in the surface of the sponge; and through these the water, after passing through the body, is ejected in a constant stream. The purpose of this extraordinary circulation is evidently to convey to the animal the nourishment it requires, and to carry off what it rejects.

Dr. Grant, who first established the existence of this current from personal observation, thus describes his interesting discovery: "I put a small branch of a living sponge with some sea water into a watch-glass under the microscope, and on moving the watch-glass so as to bring one of the openings on the side of the sponge fully into view, I beheld for the first time the splendid spectacle of this living fountain vomiting forth a torrent of liquid matter. The beauty and novelty of such a scene in the animal kingdom long arrested my attention; but after twenty-five minutes of constant observation, I was

obliged to withdraw my eye, from fatigue, without having seen the torrent for one instant change its direction, or diminish in the slightest degree the rapidity of its course. I continued to watch at short intervals, till the vehemence of the current began to diminish, and at last, at the end of six hours, it entirely ceased."

In commerce two kinds of sponges are known, the Turkey and the West Indian. The best are brought from Smyrna in Turkey, those from the West Indies being much coarser than the sponges found on the shores of the Mediterranean. In many of the Greek islands diving for sponge still forms a considerable part of the occupation of the inhabitants, as it has done from very ancient times.

3.—INSECTS.

THE species of insects in the world are twenty times more numerous than all other animals put together. Quadrupeds number about 1200 species, birds 6800, fishes 8000, while the species of insects amount to more than half a million. Besides being the most numerous, they are in some respects the most interesting and ingenious of all the forms of animal life. Among them we find some that are carpenters, others that are masons; some that are miners, others that are upholsterers, tent-makers, &c. All these belong to what may be called the "industrial classes" of the insect world; but besides these, there are butterflies, beetles, dragonflies, and thousands of others. "The butterflies are fine ladies that go a-shopping among the flowers; the beetles are the starred and jewelled

nobility; the dragonflies are warriors; while such as the humble, useful, ever busy bee, are the artisans of the insect world."

The varied beauty of insects, their glittering colours, their graceful forms, supply inexhaustible stores of attraction; while in the wonderful mechanism of their bodies we recognise the hand of that God whose wisdom and skill are alike seen in the smallest as in the greatest of his creatures. Every insect, no matter how small, has in its body the apparatus necessary for breathing; and veins and arteries for the circulation of its blood. More than this: it has a brain, and nerves, or organs answering the purpose of nerves, which run all over the body; and it is in all other respects exactly fitted for the life it leads.

GOD'S WATCHFUL CARE.

The insect that with puny wing
  Just shoots along one summer ray;
The floweret which the breath of Spring
  Wakes into life for half a day;
The smallest mote, the tenderest hair,—
All feel a heavenly Father's care.

Even from the glories of his throne
  He bends to view this earthly ball;
Sees all, as if that all were one,—
  Loves one, as if that one were all;
Rolls the swift planets in their spheres,
And counts the sinner's lonely tears.

There are three periods in the life of insects. In the first period, after leaving the egg, they are called *larvae*.

The word *larva* signifies a mask, and is used in reference to an insect, because therein its future form is more or less masked or concealed. In the second period, the insect becomes a *pupa*. This word is employed because the insect is shut up, without the power of escape, like an infant wrapped round in folds of cloth. In the moths and butterflies, the insect in this period of its life is called a *chrysalis*, because some of them, as the name implies, are gilt or adorned with golden spots. The third and last period is called the *imago*, because each individual is then an image or representative of the whole species. This state usually lasts only a short time, for most insects die immediately after their eggs are laid. Bees, wasps, and ants, however, which live in society, and labour together for the common good of the community, continue much longer in the adult state.

It is a common mistake to suppose that because a fly is little it is young, and that it will grow larger in process of time. This is not the case; for when an insect has once attained to its winged state, it grows no more. All the growing and most of the eating are done in the previous stages of life.

4.—BUTTERFLIES.

BUTTERFLIES are an extensive group of beautiful insects, and are distinguished by the brilliancy and beauty of their wings. After passing through the first period of its life the butterfly becomes a caterpillar; and in this form it is very voracious, eating enormous quantities of leaves. The skin of the caterpillar does not grow, and therefore

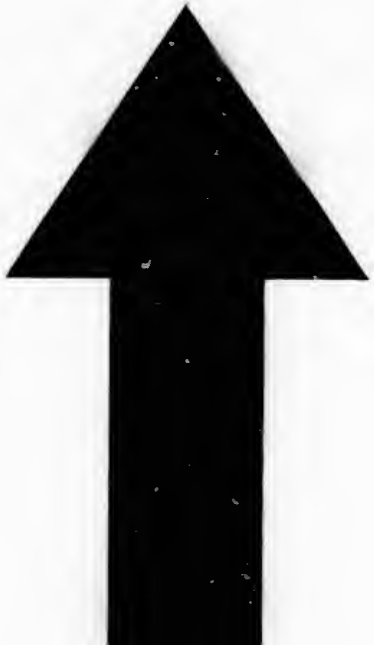
the creature soon becomes too large for its cradle. After a time, when the insect has acquired sufficient vigour, the skin is burst, and the imprisoned butterfly emerges to light and liberty. The wings of a butterfly, on its first appearance, are closely folded; but by the help of a fluid constantly circulating through them, they are soon expanded, and sufficiently hardened by the action of the air to endure the efforts of flying. The gorgeous wings of these beautiful creatures owe their beauty to an infinite number of little plumes thickly planted on their surfaces, and so minute as to seem like powder, and only discoverable by the aid of the microscope.

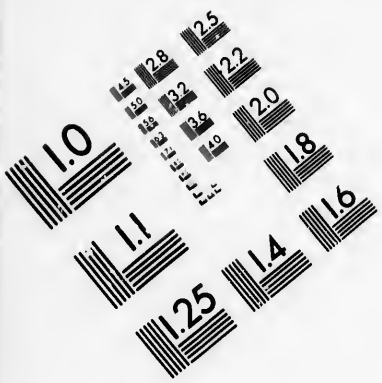
The butterfly, now in its perfect state, requires no other food than the juices which are distilled from the flowers. Light, airy, and joyous, it sports in the sunshine, and trips from bloom to bloom, gay as the brilliant morn. The skies are its proper habitation, the air is its element, and the pageantry of princes cannot vie with the rich colouring that embellishes the wings of these lovely creatures.

TO A BUTTERFLY IN A WINDOW.

Escaped thy narrow place of rest,
And in the brightest colours drest,
  Thy new-born wings prepar'd for flight,
Ah, do not, Butterfly, in vain
Thus flutter on the crystal pane,
  But go and soar to life and light.

High on the buoyant summer gale
Through cloudless ether thou may'st sail,
  Or rest among the fairest flowers;





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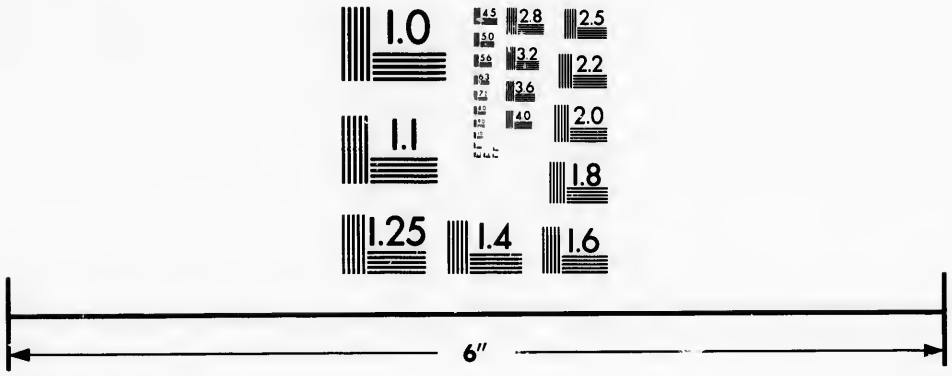

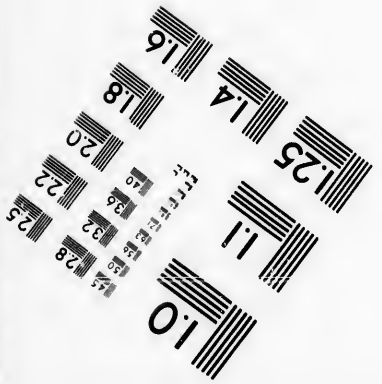

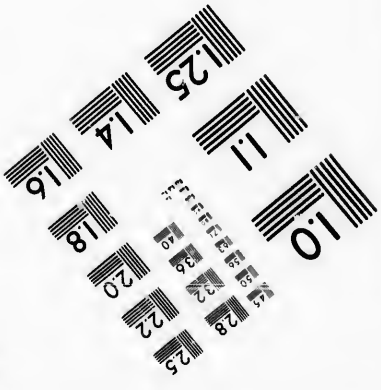

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WEBSTER, N.Y. 14580
(716) 872-4503

To meet thy joyous friends may'st speed,
Or at thy choice luxurious feed
In woodlands wild, or garden bowers.

Beneath some leaf of ample shade
Thy pearly eggs shall then be laid,
Small rudiments of many a fly:
While thou, thy frail existence past,
Shall shudder in the chilly blast,
And fold thy painted wings, and die.

Soon fleets thy transient life away;
Yet short as is thy vital day,
Like flowers that form thy fragrant food,
Thou, poor Ephemeron, shalt have fill'd
The little space thy Maker will'd,
And all thou know'st of life be good.

5.—MASON ANTS.

ANTS have been famed from all antiquity for their social and ingenious habits,—for their love of order, and for their untiring industry. The common European ants are in general either black or red. Some are furnished with stings, which they use in their defence; and others have the power of squirting out an acid fluid which inflames and irritates the skin like nettles. The eyes are extremely black, and under them are two small horns or feelers, composed of twelve joints, all covered with fine silky hair. The mouth is composed of two crooked jaws, in each of which are something resembling teeth. The breast is covered with fine silky hair, from which project six legs, each armed with two small claws, which assist the insect

in climbing. Thus provided, the ant is bolder and more active than any other creature of the insect tribe of the same size, and possesses sufficient courage to attack an animal many times larger than itself.

In England ant-hills seem formed with little regard to order and regularity; but in the more southern parts of Europe they are constructed with wonderful ingenuity. One species, called the mason ants, display great skill in the art of architecture, their nests in the interior presenting a series of labyrinths, lodges, vaults, and galleries, constructed with wonderful ingenuity. The walls are formed of small grains of moist earth, so joined together as to support one another on the principle of an arch. The brown ant, which is among the smallest of these mason ants, is one of the most industrious of its tribe, and is remarkable for the extreme finish of its work. It forms its nest in separate storeys, the partitions of which are composed of little particles so finely grained that the inner walls present one smooth, unbroken surface. On examining each storey separately, we observe a number of halls, lodges of smaller dimensions, and long galleries which serve for general communication. The arched ceilings, covering the most spacious places, are supported either by little columns, slender walls, or by regular buttresses. We also notice large open spaces, which serve as cross-roads, in which all the streets of the little town, as it may be called, terminate.

The ant-hill contains sometimes more than twenty storeys in its upper portion, and at least as many under the surface of the ground; and when the sun overheats the upper apartments, the ants withdraw with their little ones to the bottom. In the rainy season the ground floor becomes uninhabitable, and they again remove to the higher storeys.

There are, however, many species which do not make their nests in the ground, but live in trees which have become hollow from age, or in chambers which they excavate for themselves in the trunk and branches.

If a nest is built in the ground, it generally happens that there is a sort of turnpike made from the nest, above ground, to other nests, probably inhabited by near relatives. On these roads multitudes of visitors may be seen continually passing to and fro; and by these roads the ants convey to their dwellings the food for the young ants, consisting of other insects, caterpillars, earthworms, and other substances.

6.—ANT STORIES.

THE ingenuity which ants display in conveying food and other substances to their dwellings is very remarkable. A gentleman one day observed an ant dragging along what, with respect to his strength, might be called a log of timber. Others were severally employed, each in his own way. Presently the little creature came to an ascent, where the weight of the wood seemed for a while to overpower him. He did not remain long perplexed with it, for three or four others, observing his difficulty, came behind and pushed it up. As soon, however, as they had got it on level ground, they left it to his care and went to their own work. The log he was drawing happened to be considerably thicker at one end than at the other. This soon threw the poor fellow into a new difficulty. He unluckily dragged it between two bits of wood.

After several fruitless efforts, finding it could not be dragged through, he adopted the only mode that even a man in similar circumstances could have taken,—he went behind it, pulled it back again, and turned it on its edge; then, running again to the other end, he dragged it through without difficulty.

Another gentleman once noticed a settlement of ants occupied in carrying supplies along the most frequented path of a garden. He had occasion to notice the proceedings of two ants in particular, who were carrying a load too great for their strength. This industrious couple, in meeting with others who would have been proud to join them, went out of their way, to avoid receiving assistance, which to all appearance would have been very seasonable. Arrived near the entrance of their warehouse, they left the object which had cost them so much labour, and went forward to measure the dimensions of the hole which was to receive it. After looking down for some time, and seeing that it would do, they brought their burden to the edge of the pit, went down, and dragged it after them.

In some parts of South America a species of ant are in the habit of flocking in immense companies to the sacks of wheat in the granaries, and carrying off, grain by grain, with an industry worthy of a better cause, many bushels of the treasure. They infest every corner and cupboard in a house, and in vain does the thrifty house-wife endeavour to secure the contents of her larder from their depredations. They never tire, but surmount every difficulty, and, like the Goths and Huns of old, pour their legions over the whole face of the country You may, with the greatest caution, suspend your choicest preserves

from the ceiling, thinking that a place of security; but in a short time it is sure to be discovered by some roving ant, who without loss of time communicates the results of his foraging to his neighbours. The whole tribe are soon in motion; the discoverer acts as pioneer, and, with great judgment, conducts them over every impediment, along the ceiling, down the string, until at length they gain the sweetmeats, where they luxuriate at will. At other times, in order to guard the delicacy from the attacks of the ants, the vessel which contains it is placed in water, and then all is deemed secure. But not so. The ants are indefatigable; for no sooner does their sense of smelling tell them some choice dainty is enclosed therein, than they form a kind of bridge across the water, by one ant taking hold of another by his *antennæ*, or feelers; and in this way they reach the dainty, and passing it in small particles from one to another, they carry it off and enjoy it at pleasure.

Colonel Sykes, in describing some East Indian ants, says: "However incredible the fact may appear, I will not omit to mention an instance of their instinct literally bordering upon human intelligence. It was the practice in my family to leave fruit-cakes, and particularly China-preserved fruits, constantly on a side-board in an enclosed verandah off the dining-hall. A cloth was thrown over it, and to prevent the access of insects, the legs of the table were placed on low pedestals in little stone pans filled with water. The channel of water, however, did not prove a sufficient barrier. When it happened partly to dry up and become low, the little creatures waded across. When the pans were full they boldly pushed over, and succeeded in catching hold of the opposite bank

with their fore-legs before they could sink in the water; and once over they soon reached the rich repast. Though one band were put to death, each succeeding day presented similar hordes of equally bold and successful adventurers. After various attempts to put a stop to their depredations, I at last filled the pans with oil of turpentine; and this for some time proved effectual. I flattered myself that I had triumphed over their perseverance and ingenuity; but to my great surprise, in a few days the sweets were covered as before with intruders, and I was in no small degree puzzled to account for their reappearance. Accidentally passing the table, I observed an ant upon the wall about a foot above the level of the sweets. It fell from the wall and alighted on the table. Can it be possible, I said to myself, that this fall is designed? I stood to observe with the most intense curiosity. Another ant ascended and dropped with similar success on the table. Another and another followed, till there was no longer any room for doubt that instinct, if instinct I must call it, had made them in this instance a match for reason."

7.—SLAVE ANTS.

The most remarkable fact connected with the history of ants is, that one of the species kidnap the workers of another species, and compel them to labour for the benefit of the community; thus using them as slaves. So far as is yet known, the kidnappers are red or pale coloured ants; and the slaves, like the ill-treated natives of Africa, are jet black! When the red ants are about to sally forth on a marauding expedition, they send out scouts to

ascertain the exact position in which a colony of negro ants may be found. These scouts having discovered the object of their search, return to the nest and report their success. Shortly afterwards the army of red ants marches forth, headed by a vanguard, consisting of only about eight or ten ants, which is perpetually being changed, the individuals which form it, when they have advanced a little before the main body, halting, falling into the rear, and being replaced by others. When they have arrived at the negro colony, and have discovered the settlement, the foremost of the invaders rushing impetuously to the attack, are met, grappled with, and frequently killed, by the negroes on guard. The alarm is quickly communicated to the interior of the nest,—the negroes sally forth by thousands, and the red ants rushing to the rescue, a desperate conflict ensues; which, however, always terminates in the defeat of the negroes, who retire to the innermost recesses of the habitation. Now follows the scene of pillage. The red ants tear open the sides of the negro ant-hill, and rush into the heart of the citadel. In a few minutes each of the invaders emerges, carrying in its mouth the *pupa* or young ant of a worker negro, which it has obtained in spite of the vigilance and valour of its natural guardians.

These captives, as soon as they are old enough, perform the same duties in the new household that would have been allotted to them if they had remained at home. They are slaves in the strictest sense of the term, but very likely are never aware of the fact; for their new masters will never inform them that they were born in another nest, and that they were removed to their new home by force.

The wars which take place among ants, occasioned by

the attempt of one society to capture the young of another, are sometimes fierce in the extreme.

"In an Italian forest," says a distinguished naturalist, "I once came upon a footpath covered for several feet with swarms of ants, evidently occupied with something in which they had a common interest; and it turned out to be war. A detachment of red ants was coming forth from the grass in which their encampment lay. They made for a large chestnut-tree, upon which a considerable number of black ants, insects of three times their size, were posted, and where they seemed to be taking measures to receive the hostile army. There appeared to be so much ferocity and so much intelligence in the manœuvres on both sides, that it was impossible not to be interested while looking on. Having stopped some time to observe them, I saw several of the besieged party, as soon as any one of them took a prisoner, carrying him up in his mouth to what might be called a rocky height, and dropping him down on the plain below. The red ants, on the other hand, in immense force, completely surrounded the enemy's position, and stood ready to seize any straggler from above, who was sure to meet with no quarter when the fortune of war had placed him in their power."

8.—THE TERMITES OR WHITE ANTS.

THERE is a species of insects called termites, which resemble the ant family, but do not properly belong to it, though they are usually known by the name of white ants. Their habits and ingenuity are such as to distinguish them among the industrial classes of the insect world.

The whole history of these little creatures is extraordinary, and their skill in architecture is truly wonderful. They are natives of tropical climates, where they build most singular dwellings in the form of a sugar loaf, ten or twelve feet in height, and, so solid that the wild cattle can mount upon them without breaking them.

"The termites of Africa," says a distinguished naturalist, "resemble the ants in their provident and diligent labour, but surpass them, as well as the bees, wasps, and beavers, and all other animals, in the art of building, as much as the Europeans excel the least cultivated savages. Their dwellings are equal in height to five hundred times the height of the builders; and were our houses built in the same proportions, they would be twelve or fifteen times higher than the London Monument, and four or five times higher than the pyramids of Egypt. Their buildings, usually termed *hills*, from their outward appearance, in some parts of Senegal are so numerous, and so remarkable for their size, that they appear at a distance like villages of the natives. They rise to a height of ten or twelve feet, and are at first quite bare, but gradually they become covered with grass and other plants. The interior is divided with great regularity and skill into a number of apartments; some of which are intended for the residence of the king and queen, others are nurseries, while others serve as magazines, and are always well filled with stores and provisions. The exterior of the building consists of one large dome-shaped shell, while round it rise a number of turrets to the height of one or two feet. Under the hill are several subterraneous passages running in various directions, and constructed

in such a way as to show that these little creatures are miners of great skill and ingenuity.

"Each community of termites consists of a king and queen, soldiers, and labourers. The labourers are the most numerous, there being at least a hundred of them to one soldier. They are about an inch long, run extremely fast, and appear to be incessantly occupied. The king and queen reside in the centre of the hill, in a small chamber which they never leave; their subjects undertaking the task of working and fighting for them against their numerous enemies. Whenever ān attack is made on an ant hill, the soldiers run to the defence; and if a breach is made, they give fierce battle to their opponents, and continue the defence till they deem their castle secure. They then retire into the nest, and immediately the labourers may be seen in motion, hastening to bring materials for repairing the breach. While the labourers are thus employed, the soldiers take no part with them. On a renewed attack, the labourers run into the numerous lanes and galleries with which the building is perforated, and the gallant soldiers rush out as numerous and vindictive as before."

9.—THE BEE.

Among all the families of the insect world there are none which exhibit so many interesting and curious features as the bees. Their habits, formerly but very imperfectly understood, have now come to be very generally known. The individual who has done more than any other to make us familiar with the habits of the bee is Francis

Huber, one of the most patient and devoted students of the insect race that ever lived. He was born at Ferney, not far from Geneva, in Switzerland. At the age of fifteen his eyesight became so greatly impaired that he was almost totally blind; but before this he had become attached to a young lady, who afterwards became the wife of the blind naturalist. She entered into the favourite study of her husband with great ardour. She was "eyes to the blind,"—his reader, his secretary, and his guardian. Huber seems to have been worthy of his devoted wife. "As long as she lived," he used to say, "I was hardly sensible of being blind." Huber died in 1831, upwards of eighty years of age.

INVITATION TO THE BEE.

Child of patient industry!
Little, active, busy bee!
Thou art out at early morn,
Just as the opening flowers are born;
Among the green and grassy meads
Where the cowslips hang their heads;
Or by hedge-rows, while the dew
Glitters on the hare-bell blue:

Then on eager wing art flown
To thymy hillocks on the down,
Or to revel on the broom,
Or suck the clover's crimson bloom;
Murmuring still, thou busy bee,
Thy little ode to industry!

Go while Summer suns are bright,
Take at large thy wandering flight.—

Go and load thy tiny feet
With every rich and varied sweet;
Cling around the flow'ring thorn,
Dive in the woodbine's honied horn,
Seek the wild rose that shades the dell,
Explore the fox-glove's freckled bell;
Or in the heath-flower's fairy cup
Drink the fragrant spirit up.

But when the meadows shall be mown,
And Summer's garlands overblown,
Then come, thou little busy bee,
And let thy homestead be with me.
There, shelter'd by thy straw-built hive,
In my garden thou shalt live;
And that garden shall supply
Thy delicious alchymy;
There for thee, in Autumn, blows
The Indian pink and latest rose,
The mignonette perfumes the air,
And stocks, unfading flowers, are there.

Yet fear not, when the tempests come,
And drive thee to thy waxen home,
That I shall then most treacherously
For thy honey murder thee.

Ah, no!—throughout the Winter drear,
I'll feed thee, that another year
Thou may'st renew thy industry
Among the flowers, thou busy bee.

10.—HOUSEHOLD AFFAIRS IN A BEE-HIVE.

EVERY association of bees has three distinct orders,—the queen, the drones, and the workers. It is estimated that a hive usually contains from six to twelve thousand bees. In some small hives the number is much less than six thousand, while large ones have been known to contain as many as twenty thousand. There is only one queen in each swarm, whether large or small. The average proportion of drones is about fifty to each thousand workers. Hence about nineteen-twentieths of the bees in every hive are workers. The drones are the largest bees in the family. Their bodies are thick and clumsy, and they are about the size of two working bees. Their wings are large and long, and they make a loud buzzing noise when flying. They have no sting, and may be handled without harm.

They are the male bees of the hive, and live a life of idleness, taking no part in the labour. Indeed they have not the power to collect honey, or to provide themselves with food. After a time they are expelled from the hive, and killed by the worker bees, who plunge their stings into their sides, and thus destroy them.

The queen is the mother of the family, and governs the hive. She is longer and more slender than the drone, but not so large. Her legs are longer, but her wings are shorter in proportion than those of the drone or worker bee. She is majestic in all her movements, and is accompanied by a guard composed of twelve workers. This attendance is taken in turn, and never neglected. Wherever she goes the guards clear her path, always

turning their faces towards her with the greatest respect. Nothing can equal the homage shown to her majesty by the workers of the hive. Her appearance always seems to give pleasure, indicated by a quivering movement of the wings. An acute observer thus describes a scene he once witnessed:—

"The hive was of that construction which opens from behind, and showed the whole economy of the little palace within. After looking for some time, the queen made her appearance, moving slowly along, and now and then pausing to deposit an egg in one of the empty cells; and it was most interesting to see how she was constantly attended by nearly a dozen of bees, that formed a circle around her with their heads invariably turned towards her. The guard was relieved at frequent intervals, so that as she walked forward a new group from time to time took the place of the old, and these returned to the labour in which they had been previously engaged. The labourers, in whatever way occupied, would, in their turn, forsake their work and come to pay homage to her majesty, by forming a guard round her person. Every other part of the hive meanwhile presented a busy scene. Many bees were seen moving their bodies with a tremulous motion, by which thin and minute fibres of wax were shaken from their sides. Others were ready to take up this wax and knead it into matter proper for constructing cells. Frequent arrivals of bees from the field brought pollen on their thighs for the grubs, and honey which they deposited in the cells. All was activity, order, and peaceful industry. None were idle but the drones, who seemed to stroll about like gentlemen."

The chief office of the queen bee is to lay eggs, one of

which she deposits in every cell. These eggs are of two kinds,—drone eggs and worker eggs. When a worker egg is deposited in a *royal* cell, it becomes a queen bee. There are seldom more than five or ten of these cells in one hive. The queen usually commences laying as soon as the genial warmth of spring comes on. About the beginning of May she begins to deposit from two to three hundred eggs a-day. As the summer advances, several queens are hatched; but the worker bees do not allow them instant liberty, or severe battles would be sure to take place between them and the reigning queen. The workers, therefore, make a hole in the cell of a young queen, and thus supply it with food. When the reigning queen discovers one of these captives, she uses every effort to tear open the cell and destroy her rival; but the worker bees interpose to prevent this. The old queen, finding that she no longer has absolute authority in the family, commences a sudden vibration of her wings, runs over every part of the combs, followed by her subjects; and a great commotion ensues. When notice has thus been communicated to the whole family, the queen rushes towards the outlet,—the order, as it were, is then given to swarm,—and away go the workers, as if pursued by ten thousand foes. While swarming, they cluster round the queen; and wherever she alights, there the whole company immediately settle. The old queen always flies off with the first swarm; and after she has left the hive, the workers who remain release a young queen, who comes forth full of energy, and at once assumes the government of the colony. If there be enough of workers left, so that another swarm can be spared, the royal cells are still guarded by the workers.

If a hive is deprived of a queen when there are no young queens or eggs in the royal cells, they take the *larva* of a worker, place it in a royal cell, or build one of those cells round it; where, on being fed on *royal jelly*, it becomes a queen. Without this remarkable arrangement this interesting insect would soon become extinct; for if irreparably deprived of their royal member, the whole family forsake their toils, give up their young, roam about in alarm, refusing to eat, and in a few days they all die.

When a hive sends out several swarms in a year, the first is always the best, as well as the most numerous; and having the greater part of the summer before them, they have the more time for making wax and honey.

The workers are the smallest bees of the family. They build the cells, take care of the young, collect the honey, and perform all the labour; and upon them depends the prosperity of the colony. Truly may they be called workers, for no better example of industry and perseverance can be found. They sally forth before the rising of the sun, and return when evening twilight has cast her mantle over the face of nature, laden with sweets, which, but for this industrious insect, would be lost on the desert air. The improvident and the lazy may learn many a lesson from the ever busy bee.

Each association of workers is divided into three classes of labourers,—the *wax-workers*, *nursing-bees*, and *honey-gatherers;* but the individuals of each class can also perform the labours of either of the other divisions. This arrangement seems admirably adapted to promote harmony in the hive, and produce the most effectual application of labour.

The nursing-bees take care of the young, and assist in

building the cells. The wax-workers supply the wax from which the comb is made. Wax is made from honey. In making it, the bees swallow as much honey as they can; and after fifteen or twenty hours, it undergoes a chemical change, and the wax is formed in thin scales under the rings of their bodies. One of the bees then chooses a suitable place in which to deposit its wax, and others follow, till the foundation of a comb is laid. Then the nursing-bees begin to scoop it out, and to form the cells; and as more wax is needed, other wax-workers add new material, and thus enable the nursing-bees to carry on their work.

The cells are all six-sided, and so arranged that each side forms a wall to two cells; so that they all lie compactly together, and no space is lost or material wasted. How marvellous it is that an insect which many consider insignificant should be endowed with such a wonderful instinct.

It sometimes happens that a snail gets into a hive. The bees soon learn that they cannot sting him; so they go to work, and plaster up the opening of the shell, or cement it fast to the board, thus confining the poor snail a prisoner for life.

When a bee laden with honey returns to the hive, it pierces a hole in the crust of a cell, and disgorges the honey in large drops from its mouth, and again closes up the hole. Such is the course of every bee that contributes to the general store. A cell can hold the contents of many honey-bags.

Besides gathering honey, the bees have to procure *bee-bread* from the flowers, which serves as food both to the old and young. It is obtained from the little bags or

cases called *anthers*, which grow on a slender filament or thread in the midst of the flower, and are filled with a species of dust or powder. To secure this treasure the body of the bee is covered with feathery hairs, to which the powder adheres. Sometimes a bee will appear white, orange, or yellow, according to the colour of the flower-dust it has been among. When its body is thus covered, much more thickly than the miller with flour, it wipes off the dust with the brushes of its legs, collects every particle of it, and forms it into two little masses. In the middle of each of the bee's hind legs there is a sort of basket, surrounded by strong, thickly-set hairs. The two pieces of bee-bread are placed in these little baskets, and thus safely conveyed to the hive. There the bee dines from it itself, or is lightened of its load by other bees, each taking a small piece of it, till the whole is disposed of. When more bee-bread, or *pollen*, as it is called, is collected than is required for immediate use, it is stored up in some of the empty cells, ready for future use.

A new-born bee, as soon as it is able to use its wings, seems perfectly aware, without any previous instruction, what are to be its duties and employments for the rest of its life. It appears to know that it has been formed for society, and not for selfish pursuits; and therefore it invariably devotes itself and its labours to the benefit of the community to which it belongs.

During the summer a number of the workers are always engaged in ventilating the hive; which they do by vibrating their wings both at the entrance and within the hive. These vibrations are so rapid as to make the wings invisible. When one worker thus engaged retires, another

immediately takes its place, so that in a well-ordered hive there is never any interruption in the sound or humming occasioned by this action.

"So work the honey bees:
Creatures that by a rule of nature teach
The art of order to a peopled kingdom.
They have a queen, and officers of sorts,
Where some, like magistrates, counsel at home;
Others, like merchants, venture trade abroad;
Others, like soldiers, armed in their stings,
Make booty on the summer's velvet buds:
Which pillage they with merry march bring home
To the tent royal of their sovereign,
Who, busied in her majesty, surveys
The singing masons building roofs of gold;
The civil citizens, kneading up the honey;
The poor mechanic porters, crowding in
Their heavy burdens at the narrow gate;
The sad-eyed justice, with his surly hum,
Delivering o'er to executors pale
The lazy yawning drone."

SHAKSPEARE.

11.—THE GLOW-WORM AND THE FIRE-FLY.

THE glow-worm is a curious and interesting member of the beetle family, seen in England during the warm nights of summer. It is about half-an-inch in length, and possesses the power of emitting a vivid and beautiful light

as soon as the dusk of evening commences, and can often be seen lighting up the woods, pastures, and hedgerows with its brilliant little lamp.

THE GLOW-WORM.

"If, on some balmy breathing night of spring,
The happy child, to whom the world is new,
Pursues the evening moth of velvet wing,
Or from the heath-flower beats the sparkling dew
He sees, before his inexperienced eyes,
The brilliant glow-worm like a meteor shine
On the turf bank. Amazed and pleased, he cries,
"Star of the dewy grass, I make thee mine!"
Then, ere he sleeps, collects the moistened flower,
And bids soft leaves his glittering prize infold;
And dreams that fairy lamps illume his bower;
Yet, with the morning, shudders to behold
His lucid treasure rayless as the dust.
So turns the world's bright joys to cold and blank disgust."

Seen by daylight, the glow-worm has neither lustre nor beauty of shape.

The *fire-fly* is another insect of the same kind, found in warmer climates. It carries a pair of flaming lamps on its back, and in the West Indies, where it is very abundant, it is often seen in such numbers as to light up a whole meadow in a dark night. "While in the mountains of Jamaica," says a traveller, "I have observed the fire-fly appear in such myriads at night as to render the pathway quite plain and visible."

To watch the brilliant little lamp of the fire-fly sweeping in a graceful curve through the air, as the insect wings its way from tree to tree, is like a scene in fairy-land.

12.—THE SPIDER AND HIS PALACE.

THE spider is a cunning fellow, making his living by his arts and stratagems. Formed for a life of rapacity, and incapable of living on any other than insect food, all his habits are calculated to deceive and surprise. He lives by snares and plots; and no doubt it is partly on this account that the family to which he belongs are so generally disliked; for it is natural to the human mind to prefer that which is open and confiding to that which is wily and treacherous. And yet the spider, from his habits and modes of life, is a very interesting little creature. He exhibits wonderful skill and ingenuity in weaving his nest, and is possessed of extraordinary patience and perseverance. The thread of the spider, like that of the silk-worm, is originally a soft, glutinous substance, contained in a little bag in the body of the insect. A single thread, small as it is, consists of an immense number joined together into one as they issue from the spinners of the insect's body. There are five spinners, each of them containing a great many tubes,—so numerous and fine that it is said a single thread consists of more than 5000 fibres!

The *garden spider* is remarkable for the lightness and delicacy of the web he constructs. It is beautifully arranged in circles, with lines running across it from the centre, like the spokes of a wheel. In the centre he

sometimes takes his station, to watch for his prey; but he always spins a cell in a retired spot, in which he may lurk unobserved. When an insect is caught, he sallies forth and secures it.

One kind of spider, when about to cross a pond or stream of water, leaps on the surface, using some of his legs for sails, others for oars, and one for a rudder. He steers his way, varying the direction, and sailing faster or slower in his adventurous voyage, like a skilful mariner.

There are a great many different kinds of spiders. One of the most curious is that known by the name of the *epeira*. A distinguished naturalist thus describes the persevering labours of one of this species which he found in the island of Arran:—"The tent of this spider, instead of being on the ground, was built on the tops of the common grass, about a foot high. Being rather a gigantic spider, had he built it on the top of one stalk, the house and its inhabitants might have borne it down to the ground. But he contrived to bring several heads together whose roots stood apart, and with cordage which he could furnish at will, had bound them firmly together, so that his elevated habitation was anchored on all sides. From whatever direction the wind blew, it had at once hawser and stay. Not only did he bind the heads together, but he had doubled and fastened them down as a thatch roof, under which his habitation was suspended As he was a larger spider than usual, his house was large,—the more capacious apartment, which I believe was the nursery, being below, and the smaller one, which was his observatory or watch-tower, being above. From the watch-tower he could pounce upon his prey; or, in case of hostile attack, could make his escape by a postern gate,

so as to conceal himself among the grass." This species of spider is remarkable for its industry and perseverance. "Go to the ant, thou sluggard." Go also to the spider. He who taught the one taught the other; and learning humility, let both teach thee.

One of the greatest of the Scottish kings, about five hundred years ago, disdained not to learn of a spider in the very district in which this spider was found. The tradition still lingers in Arran that King's-Cross-Point was so named because from this point King Robert the Bruce sailed for Carrick in Ayrshire. When he had been, by a train of adverse circumstances, almost driven to despair, it is said that after a sleepless night in a humble cot on this rocky point, he in the morning observed from his lowly bed a spider actively employed in weaving his silken web. To make it firm and extensive, he endeavoured to fasten his filmy threads on a beam projecting from the roof; but in attempting to reach this beam, he fell down to the ground. Six times he repeated the attempt with no better success; but instead of being discouraged, he made a seventh attempt, reached the wished-for point, fastened his adhesive cords, and went on triumphantly with his work. On observing this, the king sprang up with reviving hope and fresh resolution. "Shall I," said he, "be more easily discouraged than this insect? Shall he, in spite of repeated failures, persevere till crowned with success, though his object be to enslave and destroy; and shall I leave anything untried that I may deliver from thraldom my oppressed subjects?" He hastened to the beach, launched a fishing-boat, sailed from *King's-Cross-Point* for Ayrshire, which he reached in safety. Secretly assembling his adherents in Carrick,

he made a sudden and successful attack on his own castle of Turnberry, which he took from the vanquished English garrison; and following up this auspicious blow, he advanced on the side of victory, till at Bannockburn he drove the invaders from the land, and set Scotland free.

BRUCE AND THE SPIDER.

For Scotland's and for freedom's right
The Bruce his part had played,—
In five successive fields of fight
Been conquered and dismayed;
Once more against the English host
His band he led, and once more lost
The meed for which he fought;
And now from battle, faint and worn,
The homeless fugitive forlorn
A hut's lone shelter sought.

And cheerless was that resting-place
For him who claimed a throne:
His canopy, devoid of grace,
The rude, rough beams alone;
The heather couch his only bed,—
Yet well I ween had slumber fled
From couch of eider down!
Through darksome night to dawn of day
Absorbed in wakeful thought he lay
Of Scotland and her crown.

The sun rose brightly, and its gleam
Fell on that hapless bed,
And tinged with light each shapeless beam
Which roofed the lowly shed;

When, looking up with wistful eye,
The Bruce beheld a spider try
His filmy thread to fling
From beam to beam of that rude cot;
And well the insect's toilsome lot
Taught Scotland's future king.

Six times his gossamery thread
The wary spider threw;
In vain the filmy line was sped,
For powerless or untrue
Each aim appeared, and back recoiled
The patient insect, six times foiled,
And yet unconquered still:
And soon the Bruce, with eager eye,
Saw him prepare once more to try
His courage, strength, and skill.

One effort more,—his seventh and last!
The hero hailed the sign!
And on the wished-for beam hung fast
That slender silken line.
Slight as it was, his spirit caught
The more than omen; for his thought
The lesson well could trace
Which even "he who runs may read,"—
That Perseverance gains its meed,
And Patience wins the race.

Bernard Barton.

Another interesting species of spider is the *gossamer spinner*, one of the smallest of the whole family. He does not weave a web, but makes use of his fine delicate threads

as a kind of balloon for floating through the air. The gossamer threads are so fine that they cannot be seen unless the sun shines on them. When inclined to take a voyage in the air, this spider ascends some slight eminence, as the top of a wall or the branch of a tree, and turning his head towards the wind, darts out several threads from his spinners, and rising from his station, commits himself to the gale, and is thus carried far beyond the height of the loftiest towers.

During flight, it is probable the gossamer spinners employ themselves in catching such minute insects as may happen to come in their way; and when satisfied with their journey, they suffer themselves to fall, by gradually disengaging themselves from the threads that supported them in their airy voyage.

THE GOSSAMER SPINNER.

"Small, viewless aeronaut, that, by the line
Of gossamer suspended, in mid-air
Float'st on a sunbeam, say at where
Ends thy breeze-guided voyage? With what design
In ether dost thou launch thy form minute,
Mocking the eye? Alas! before the veil
Of denser clouds shall hide thee, the pursuit
Of the keen swift may end thy fairy sail.
Thus on the golden thread that fancy weaves,
The young and visionary dreamer leaves
Life's dull realities. * * *
But soon at sorrow's touch the radiant dreams dissolve."

SPELLING LESSONS

TO PART III.

I.

Twi'-light, the faint light after sunset and before sunrise.
Trans-pa'-rent, that can be seen through; clear.
Mi-nute', very small.
Ad'-e-quate, sufficient.
In'-fi-nite, without limits; boundless.
Tel'-e-scope, an instrument by which we can see distant objects.
Rec'-og-nise, to know again.
In-sig-nif'-i-cance, without meaning; of no importance.
Riv'-u-let, a small stream.

II.

Mech'-an-ism, structure.
Struc'-ture, form or manner of building.
Def'-i-nite-ly, (from de-fine, to mark the limits of,) to bound; to determine.
Fi'-bre, a slender thread.
Ex-traor'-di-na-ry, beyond ordinary; remarkable.
Ex-ist'-ence, being.
Spec'-ta-cle, anything seen; a sight.
Fa-tigue', weariness.
Di-min'-ish, grow less.
Ve'-he-mence, force; violence.
Med-i-ter-ra'-ne-an, in the midst of or surrounded by land. (Applied to the great sea lying between Europe and Africa.)

III.

Quad'-ru-ped, an animal having four feet.
In-gen'-ious, possessing skill.
Up-hol'-ster-er, one who furnishes houses.
In-dus'-tri-al, working
Art'-is-an, a workman.
In-ex-haust'-i-ble, that cannot be exhausted.
Rec'-og-nise, to know again.
Ap-pa-ra'-tus, a thing prepared; a contrivance.
Pu'-ny, small.
Flow'-er-et, a small flower.
Pu'-pa, Latin word for infant.
Chrys'-a-lis, golden. (Applied to seets before they become winged.)
Rep-re-sent'-a-tive, one who represents or stands for another.
Com-mu'-ni-ty, a society.

IV.

Ex-ten'-sive, large.
Dis-tin'-guished, marked.
Brill'-ian-cy, shining; splendour.
Cat'-er-pil-lar, a grub.
Vo-ra'-cious, greedy.
Suf-fi'-cient, enough.
E-merge', to rise out of.
Ex-pand', to spread out.
En-dure', to bear.
Gor'-geous, splendid.
Plume, a feather.
Dis-cov'-er-a-ble, that can be found out.
Dis-tilled', to flow gently.
Hab-i-ta'-tion, dwelling.
Pa'-geant-ry, show; pomp.
Vie, rival.
Em-bel'-lish, to adorn.
Buoy'-ant, light.
E'-ther, the lightest air.
Lux-u'-ri-ous, delighting in luxury.

Ru'-di-ment, the first form of anything.
Tran'-sient, passing; short-lived.
Vi'-tal day, day of life.
Fra'-grant, having a sweet smell.
E-phem'-e-ron, an insect that lives only a day. (Here applied to the butterfly because it is short-lived.)

V.

So'-cial, inclined to company.
Ir'-ri-tate, to excite heat.
Pro-ject', throw forward.
Arch'-i-tec-ture, the art of building.
Lab'-y-rinth, a place full of windings.
Par-ti'-tion, that which divides or separates.
Par'-ti-cle, a very small part.
Di-men'-sion, size; extent.
But'-tress, a prop; a support.
Ter'-mi-nate, end.
A-part'-ment, a part of a house.
Un-in-hab'-it-a-ble, that cannot be inhabited.
Ex'-ca-vate, to hollow.

VI.

Per-plex', to puzzle.
Fruit'-less, vain; without effect; useless.
Cir'-cum-stances, state of affairs.
Sim'-i-lar, like.
Set'-tle-ment, a colony.
Fre-quent', to visit often.
Re-ceiv'-ing, taking; accepting.
As-sist'-ance, help.
Sea'-son-a-ble, timely; happening at the proper time.
Gran'-a-ry, a store-house for grain.
En-deav'-our, try; attempt.
Dep-re-da'-tion, robbery.
Sur-mount', to rise above.
Sus-pend', to hang up.
Ceil'-ing, the inner roof.
For'-age, to wander in search of provisions.
Lux-u'-ri-ate, to feed or live luxuriously.
In-de-fat'-i-ga-ble, unwearied.
In-cred'-i-ble, not to be believed.
Ve-ran'-dah, an open portico.
Ped'-es-tal, the base of a pillar, &c.
Re-past', a meal.
Tur'-pen-tine, a resinous substance got from fir or pine trees.
Per-se-ver'-ance, not giving up.
Re-ap-pear'-ance, appearing again.
Ac-ci-dent'-al-ly, by chance.
De-signed', intended.

VII.

Kid'-nap, to steal.
Ma-raud'-ing, plundering.
Van'-guard, the first line of an army.
Im-pet'-u-ous-ly, violently.
Vig'-i-lance, watchfulness.
Guard'-i-an, protector.
Oc-ca'-sioned, caused.
De-tach'-ment, a party.
Fe-roc'-i-ty, fierceness.
In-tel'-li-gence, understanding; skill.
Ma-nœu'-vre, a skilful movement.
Be-sieged', hemmed in.

VIII.

Re-sem'-ble, to be like.
Trop'-i-cal, within the tropics or warm parts of the earth.
Cul'-ti-va-ted, improved; (*cultivate*, originally, to till; to prepare for crops.)
Mag-a-zine', a store-house.
Ex-te'-ri-or, outside.
Sub-ter-ra'-ne-ous, underground.
In-ces'-sant-ly, constantly.
Op-po'-nent, enemy.
Per'-fo-ra-ted, pierced with holes.
Vin-dic'-tive, full of revenge.

IX.

Im-paired', weakened.
Freck'-led, marked with spots.
De-li'-cious, sweet; pleasant.
Al'-chy-my, secret chemistry.
Mign-o-nette, an annual flower.

X.

As-so-ci-a'-tion, a company.
Quiv'-er-ing, trembling.
E-con'-o-my, arrangement; management.

In-va'-ri-a-bly, constantly.
Trem'-u-lous, trembling; shaking.
De-pos'-it, lay down.
In-ter-pose', interfere.
Ab'-so-lute, complete; unlimited.
Com-mo'-tion, disturbance.
En-sue', to follow.
Re-lease', to set free.
Ex-tinct', put to an end.
Ir-rep'-a-ra-bly, without recovery.
Pros-per'-i-ty, success.
Im-prov'-i-dent, not providing beforehand.
Pro-mote', forward; encourage.
Ef-fec'-tu-al, with effect; useful.
Suit'-a-ble, fitting.
Com-pact'-ly, closely.
Dis-gorge', to throw out.
Con-trib'-ute, to add to the common stock.
Ad-here', to stick to.
Ven'-ti-lat-ing, fanning with wind.
In-ter-rup'-tion, stoppage.
Mag'-is-trate, a public officer.
Sov'-er-eign, chief ruler.
Ex'-e-cu-tor, here used for executioner.

XI.

E-mit', to send out.
In-ex-pe'-ri-ence, want of skill or experience.
Me'-te-or, a shining body in the air.
Il-lume', brighten; light up.
Lu'-cid, shining.
Ray'-less, without light.
Lus'-tre, brightness.

XII.

Strat'-a-gem, a trick.
Ra-pac'-i-ty, plunder.
De-ceive', to cheat.
Wi'-ly, sly.
Treach'-er-ous, breaking faith.
Con-fid'-ing, trusting.
Glu'-ti-nous, like glue.
Ad-vent'-ur-ous, daring.
Mar'-i-ner, a sailor.
Gi-gan'-tic, like a giant.
Haw'-ser, a small cable.
Ca-pa'-cious, wide; large.
Ob-serv'-a-to-ry, a place for making observations.
Post'-ern, a small back gate.
Slug'-gard, a lazy fellow.
Ad-he'-sive, that adheres to; sticky.
Ad-her'-ent, a follower.
Van'-quished, overcome; defeated.
Au-spi'-cious, favourable.
In-vad'-er, one who enters as an enemy.
Suc-ces'-sive, following in order.
Fu'-gi-tive, a runaway.
For-lorn', forsaken.
Can'-o-py, a cloth of state carried over a person; a cover.
De-void', not possessing; without.
Ei'-der, a kind of duck.
Dark'-some, gloomy.
Hap'-less, unhappy.
Wist'-ful, eager.
Toil'-some, full of toil.
Gos'-sa-me-ry, thin like the threads of the gossamer.
Wa'-ry, cautious.
Re-coil', to go back.
Foiled', defeated.
O'-men, a sign of some future event.
Em'-i-nence, a height.
Dis-en-gage', to set free.
A'-er-o-naut, one who ascends in a balloon.
View'-less, that cannot be seen.
Vis'-ion-a-ry, not real.
Ra'-di-ant, bright.
Dis-solve', to melt away.

IV.—BIRDS.

1.—THE HUMMING-BIRD.

HUMMING-BIRDS are natives of America. They are at once the smallest and the most brilliantly coloured of the whole feathered race. There are many species, all varying in size from that of a wren to a humble bee, and exhibiting a splendour and beauty of plumage which it is hardly possible to describe. These gems of animated nature are to be seen clad in the loveliest crimson, blue, and green, laid on a ground of gold; but much of their varied elegance is lost when they are not seen in their native woods. Nothing can be more beautiful than to see them glittering like gems among the highly scented blossoms of the warm countries which they inhabit.

They possess a long and extremely slender bill, with which they extract the nectar, and the small insects which lurk in the recesses of the flowers. They are formed for rapid flight, and are almost ever on the wing. "Wherever a creeping vine opens its fragrant clusters, or wherever a tree-flower blooms, these lovely creatures are to be seen. In the garden, in the woods, over the water, everywhere they are darting about,—of all sizes,

from one that might easily be mistaken for a different variety of bird, to the tiny hermit, whose body is scarcely so large as that of the bee buzzing about the same sweets. Sometimes they are seen chasing each other with a rapidity of flight and intricacy of path the eye is puzzled to follow. Again, circling round and round, they rise high in mid-air, then dart off to some distant attraction. Perched upon a little limb they smooth their plumes, and seem to delight in their dazzling hues; then darting off again, they skim along, stopping now and then before a flower and extracting its honey as they hover in the air. Their wings vibrate with such rapidity that the motion is scarcely visible; and it is from the constant murmur or humming sound caused by the rapid vibration that these beautiful little creatures derive their name."

The nest of the humming-bird is very beautifully constructed of the softest down, gathered from the silk-cotton tree, and covered on the outside with bits of leaves and moss. The nest of the smallest species is about as big as the half of a walnut, and in this tiny cup the lovely creature rests.

THE HUMMING-BIRD.

Minutest of the feather'd kind,
Possessing every charm combin'd,
Nature, in forming thee, design'd
That thou should'st be
A proof within how little space
She can comprise such perfect grace,
Rendering thy lovely fairy race
Beauty's epitome.

Those burnished colours to bestow,
Her pencil in the heavenly bow
She dipp'd; and made thy plumes to glow
With every hue
That in the dancing sun-beam plays;
And with the ruby's vivid blaze
Mingled the emerald's lucid rays
With halcyon blue.

Then placed thee under genial skies,
Where flowers and shrubs spontaneous rise,
With richer fragrance, bolder dyes,
By her endued;
And bade thee pass thy happy hours
In tamarind shades and palmy bowers,
Extracting from unfailing flowers
Ambrosial food.

There, lovely bee-bird! may'st thou rove
Through spicy vale and citron grove,
And woo and win thy fluttering love
With plume so bright;
There rapid fly, more heard than seen,
'Mid orange-boughs of polished green,
With glowing fruit, and flowers between
Of purest white.

There feed and take thy balmy rest,
There weave thy little cotton nest,
And may no cruel hand molest
Thy timid bride;

Nor those bright changeful plumes of thine
Be offered on the unfeeling shrine,
Where some dark beauty loves to shine
In gaudy pride.

Such triflers should be taught to know,
Not all the hues thy plumes can show
Become them like the conscious glow
Of modesty;
And that not half so lovely seems
The ray that from the diamond gleams,
As the pure gem that trembling beams
In pity's eye!

C. Smith.

THE HUMMING-BIRD.

In the radiant islands of the West,
Where fragrant spices grow,
A thousand thousand humming-birds
Go glancing to and fro.

Like living fires they flit about
Scarce larger than a bee,
Among the broad palmetto leaves,
And through the fan-palm tree.

And in those wild and verdant woods
Where stately moras tower,
Where hangs from branching tree to tree
The scarlet passion-flower;

Where on the mighty river banks,
La Plate and Amazon,
The cayman, like an old tree trunk,
Lies basking in the sun;

There builds her nest the humming-bird
  Within the ancient wood,
Her nest of silky cotton down,
  And rears her tiny brood.

She hangs it to a slender twig,
  Where waves it light and free,
As the campanero * tolls his song
  And rocks the mighty tree.

All crimson is her shining breast
  Like to the red red rose;
Her wing is the changeful green and blue
  That the neck of the peacock shows.

Thou happy happy humming-bird,
  No winter round thee lours;
Thou never saw'st a leafless tree,
  Nor land without sweet flowers

A reign of summer joyfulness
  To thee for life is given;
Thy food, the honey from the flower;
  Thy drink, the dew from heaven!

Mary Howitt.

2.—THE OSTRICH.

THE humming-bird is the smallest and the ostrich the largest of birds. The ostrich is often found eight feet in height, from the crown of the head to the ground. It

* *Campanero*—a West Indian bird, whose note sounds like the toll of a distant convent-bell.

inhabits the sandy deserts of Arabia and Africa, in large flocks, everywhere avoiding the society of man.

Among the Arabs it is called the *camel-bird*, because, like that animal, it lives in the desert, and can exist a long time without water; and probably, also, because of the general appearance of its neck, body, and legs. The top of the head and the neck are covered with hair instead of feathers. Each foot is divided into two toes, which may be compared to the hoof of a camel; and like it, too, the under part is provided with a soft pad, or cushion, well suited to its movements over the sandy deserts it inhabits.

There is a beautiful description of the ostrich in the thirty-ninth chapter of the book of Job:—

"Gavest thou wings and feathers unto the ostrich?
Which leaveth her eggs in the earth,
And warmeth them in dust,
And forgetteth that the foot may crush them,
Or that the wild beast may break them."—(Ver. 13–15.)

The hen ostrich usually sits upon her eggs as other birds do; but as the heat of the sun aids in hatching her brood, she often leaves her nest for some time. She frequently wanders far in search of food, or is easily driven away; and it is said, if she finds another nest with eggs, she will sit upon them, forgetful of her own.

"She is hardened against her young ones,
As though they were not hers:
Her labour is in vain without fear."—(Ver. 16.)

"On the least noise, or most trivial occasion," says Dr. Shaw, "she forsakes her eggs or her young ones, to which perhaps she never returns; or if she does, it may be too

late either to restore life to the one or preserve the lives of the others. The Arabs often meet with a few of the little ones, no bigger than well-grown pullets, half starved, straggling and moaning about, like so many distressed orphans, looking for their mother. In this manner the ostrich may be said to be 'hardened against her young ones, as though they were not hers:' 'her labour,' in hatching and attending them, so far being 'vain without fear,' or the least concern of what becomes of them afterwards.

"Because God hath deprived her of wisdom,
Neither hath he imparted to her understanding."
(Ver. 17.)

Many of the habits of this bird seem to show great dulness and want of understanding. For instance, it sometimes hides its head when closely pursued, as though it thereby quite concealed its whole body! Its senseless choice of food is also very remarkable: it greedily swallows anything that comes in its way. It lives, however, chiefly on vegetable substances, as seed and grain, and is often found a most unwelcome visitor to the African farmer.

"What time she lifteth up herself on high,
She scorneth the horse and his rider."—(Ver. 18.)

The ostrich is often hunted on horseback; and though its wings are of no service in flying, they are very useful for increasing its speed. It flaps them to the wind, using them as sails and paddles, and thus urges its way along with great force. In its rapid flight, its long toes cast the sand and stones behind it, like shot, against its pursuers.

When M. Adanson was at Podar, a French factory on the southern bank of the River Niger, two young but

well-grown ostriches belonging to the factory afforded him a very amusing sight. They were so tame that two little black boys mounted together on the back of the larger. No sooner did it feel their weight than it set off running as fast as possible, carrying them several times round the village. He then asked an adult negro to mount the smaller, and two others the larger of the birds. At first the ostriches moved at a sharp trot; but when they became a little heated, they stretched out their wings to catch the wind, and ran with the fleetness of a race-horse.

The ostrich is chiefly valued for the feathers of its wings and tail, which are used as ornaments of dress, and in their unprepared state often sell for £16 per pound weight. The young reader may remember that the crest of the Prince of Wales is formed of three ostrich feathers, with the motto, *Ich dien*, or "I serve." The origin of this is said to be as follows:—The king of Bohemia, who was slain at the battle of Cressy, in the year 1346, wore this crest and motto. These were assumed by his conqueror, Edward, the Prince of Wales, and have been worn ever since by the heir to the British crown.

Mr. Moffat, in his work, "Missionary Labours in South Africa," describes the method of the Bushmen in hunting ostriches. A native, dressed with the skin and feathers of one of these birds, makes a good representation of a living ostrich. His legs being whitened, he approaches a flock of ostriches. The "human bird" mimics the real bird by pecking on the ground and shaking his feathers: he now trots, and then walks, until he gets within bow-shot, when he discharges a poisoned arrow, which he has concealed, and generally succeeds in taking his prey.

3.—SONGS OF BIRDS.

It is remarkable that scarcely any large bird is known to sing. Nearly all the minstrels of the woods are little creatures, from whose throats we could scarcely expect the torrent of melody with which they make the woods resound.

In Britain the songs of birds are chiefly heard in spring and early summer.

"Then how each bough a silver music yields!
The lusty throstle, early nightingale,
Accord in tune, though varying in their tale;
The chirping swallow, called forth by the sun,
And crested lark their airy courses run;
The yellow bees the air with music fill;
The finches carol, and the turtles bill."

Nothing can be more delightful than, in the freshness and loveliness of spring, to walk in the country, and listen to the gay minstrels as they carol their sweet songs; to hear the wild linnet, the song-thrush, and the blackbird, in their native woods; or to listen to the sky-lark, as it soars aloft to the sky, singing its song of liberty.

"Ah! who that hears thee carol free
Those jocund notes of liberty,
And sees thee independent soar
With gladsome wing the blue sky o'er,
In wiry cage would thee restrain,
To pant for liberty in vain;

And see thee 'gainst thy prison grate
Thy little wings indignant beat,
And peck and flutter round and round
Thy narrow, lonely, hated bound,
And yet not ope thy prison door,
To give thee liberty once more?
None! none! but he whose vicious eye
The charms of Nature can't enjoy;
Who dozes those sweet hours away
When thou beginn'st thy merry lay;
And 'cause his lazy limbs refuse
To tread the meadows' morning dews,
And there thy early wild notes hear,
He keeps thee lonely prisoner.
Not such am I, sweet warbler; no!
For should thy strains as sweetly flow,
As sweetly flow, as gaily sound
Within thy prison's wiry bound,
As when thou soar'st with lover's pride,
And pour'st thy wild notes far and wide,
Yet still, deprived of every scene,—
The yellow lawn, the meadow green,
The hawthorn bush besprent with dew,
The skyey lake, the mountain blue,—
Not half the charms thou'dst have for me
As ranging wide at liberty."

4.—BRITISH SONG-BIRDS—THE ROBIN

Art thou the bird whom man loves best,
The sweet bird with the scarlet breast,—

Our little English Robin,—
The bird that comes about our doors
When autumn winds are sobbing?
Art thou the '*Peter*' of Norway boors,
Their '*Thomas*' in Finland,
And Russia far inland—
The bird that by some name or other
All men who know thee call thee brother?

Wordsworth.

Nearly every country has its robin, though the robins of America, Australia, and other regions, are entirely different birds from the English robin.

The English robin, that favourite of children, associated in their minds with the touching ballad of "The Babes in the Wood," is a well known song-bird, and remarkable for the familiarity with which in winter it approaches the dwellings of man. When the frost becomes severe, and the snow covers the ground, he will approach a house, and, by his little coaxing ways and fearless confidence, win the regard of the dwellers within,—sometimes even tapping at the window and begging admission.

"Half afraid, he first
Against the window beats; then brisk alights
On the warm hearth; then hopping o'er the floor,
Eyes all the smiling family askance,
And pecks and starts, and wonders where he is;
Till more familiar grown, the table crumbs
Attract his slender feet."

The red-breast seeks an asylum with us and becomes a partaker of our bounty in a season of severity and want;

but the moment it can provide for itself, away it flies to the woods and shades.

In spring it retires to the woods, where, with its mate, it prepares for the accommodation of its family. The nest, constructed of moss and dried leaves, intermixed with hair and lined with feathers, is placed near the ground, and sometimes in old buildings, but always artfully concealed. While the female is busy with household affairs, the male sits at no great distance from the nest, and makes the woods resound with his enlivening strains. As soon as the young are able to provide for themselves, the nest is forsaken, and the robins again approach the dwellings of man.

While such birds as the nightingale and the swallow leave Britain in the winter, the red-breast continues with us during the entire year, and even in winter it is frequently heard warbling its cheerful song.

"And thou, sweet warbler, with rosy breast,
Art thou still content in thine home to rest?
Have no birds woo'd thee to join their band,
With fairy tales of some far-off land,—

Of roses that bloom o'er the foaming seas,
Of scented myrtles, and tall palm-trees?
We love thee, sweet robin, thou'rt fond and true,
And *winter* friends are ever few."

THE RED-BREAST AND SWALLOW.

The swallows, at the close of day,
When autumn shone with fainter ray,
Around the chimney circling flew,
Ere yet they bade a long adieu

To climes where soon the winter drear
Shall close the unrejoicing year.
Now with swift wing they skim aloof,
Now settle on the crowded roof,
As counsel and advice to take,
Ere they the chilly north forsake;—
Then one, disdainful, turned his eye
Upon a red-breast twittering nigh,
And thus began with taunting scorn:—

"Thou household imp, obscure, forlorn!
Through the deep winter's dreary day,
Here dull and shivering shalt thou stay;
Whilst we, who make the world our home,
To softer climes impatient roam,
Where Summer still on some green isle
Rests with her sweet and lovely smile.
Thus speeding far and far away,
We leave behind the shortening day."

"'Tis true (the red-breast answered meek),
No other scenes I ask or seek;
To every change alike resigned,
I fear not the cold winter's wind.
When Spring returns, the circling year
Shall find me still contented here;
But whilst my warm affections rest
Within the circle of my nest,
I learn to pity those that roam,
And love the more my humble home."

W. L. Bowles.

5.—THE LARK.

LARKS are the only birds that sing during flight. There are a number of different kinds, as the *sky-lark*, the *wood-lark*, the *tit-lark*, and the *field-lark*, all celebrated as songsters; but the most melodious of all is the sky-lark. It is a bird about seven inches in length, with dark plumage on the upper part of the body, and with the breast and the lower part of yellow spotted with black.

The sky-lark commences its song early in spring, and continues it during the whole summer. When it first rises from the earth, its notes are feeble and interrupted; but as it ascends, they gradually swell to their full tone; and long after the bird has reached a height where it is lost to the eye, it still continues to charm the ear with its melody.

THE SKY-LARK.

Bird of the wilderness,
Blithesome and cumberless,
Sweet be thy matin o'er moorland and lea!
Emblem of happiness,
Blest is thy dwelling-place,—
O to abide in the desert with thee!
Wild is thy lay and loud,
Far in the downy cloud:
Love gives it energy, love gave it birth.
Where, on thy dewy wing,
Where art thou journeying?
Thy lay is in heaven, thy love is on earth.
O'er fell and fountain sheen,
O'er moor and mountain green,

O'er the red streamer that heralds the day,
Over the cloudlet dim,
Over the rainbow's rim,
Musical cherub, soar, singing, away!
Then, when the gloaming comes,
Low in the heather blooms
Sweet will thy welcome and bed of love be!
Emblem of happiness,
Blest is thy dwelling-place,
O to abide in the desert with thee!

Hogg.

6.—THE CUCKOO.

THE cuckoo is a bird about fourteen inches in length, with plumage of a pale-blue on the head, neck, and back, and white crossed with lines of black on the breast and belly.

It visits England early in the spring,—its well known note being heard about the middle of April, and ceasing at the end of June.

Hail, beauteous stranger of the grove,
Thou messenger of spring!
Now Heaven repairs thy rural seat,
And woods thy welcome sing!

What time the daisy decks the green,
Thy certain voice we hear:
Hast thou a star to guide thy path,
Or mark the rolling year?

Delightful visitant! with thee
I hail the time of flowers,

And hear the sound of music sweet
From birds among the bowers.
The school-boy wandering through the wood,
To pull the primrose gay,
Starts, the new voice of spring to hear,
And imitates thy lay.
Soon as the pea puts on its bloom,
Thou fliest thy vocal vale,
An annual guest in other lands,
Another spring to hail.
Sweet bird! thy bower is ever green,
Thy sky is ever clear;
Thou hast no sorrow in thy song,
No winter in thy year.
Oh, could I fly, I'd fly with thee!
We'd make with social wing
Our annual visit o'er the globe,
Companions of the spring. *Michael Bruce.*

The most remarkable thing about the cuckoo is, that it constructs no nest for itself, and never hatches its own eggs, but deposits them in the nests of other birds, very frequently in that of the hedge-sparrow. It appears to be endued with the faculty of discerning what species of birds are suitable nursing-mothers for its disregarded eggs and young, and deposits them only under *their* care,—thus instancing in a striking manner the operation of that wonderful faculty called "instinct," which the Creator has bestowed on the lower animals. When the cuckoo is hatched, it turns the young hedge-sparrows out of the nest, and remains itself in it, the sole care of its foster-parents. When sufficiently fledged, it takes a final leave,

often pursued by other little birds, who show an inclination to revenge themselves on this usurper of the rights of the infant hedge-sparrows.

THE CUCKOO.

Whence is the magic pleasure of the sound?
How do we long recall the very tree
Or bush near which we stood, when on the ear
The unexpected note, *cuckoo!* again,
And yet again, came down the budding vale?
It is the voice of Spring among the trees;
It tells of lengthening days, of coming blooms;
It is the symphony of many a song.
But, there, the stranger flies close to the ground,
With hawk-like pinion, of a leaden blue.
Poor wanderer! from hedge to hedge she flies,
And trusts her offspring to another's care:
The sooty-plumed hedge-sparrow frequent acts
The foster-mother, warming into life
The youngling, destined to supplant her own.
Meanwhile the cuckoo sings her idle song,
Monotonous, yet sweet, now here, now there,
Herself but rarely seen; nor does she cease
Her changeless note, until the broom, full blown,
Give warning that her time for flight is come.
Thus, ever journeying on, from land to land,
She, sole of all the innumerous feathered tribes,
Passes a stranger's life, without a home. *Grahame.*

7.—THE NIGHTINGALE.

THE nightingale is a bird about six inches in length; and though celebrated as a songster, it cannot boast of

any richness or variety in its plumage. Its general colour is a rusty brown, with white on the throat and the belly.

It is a bird of passage, generally appearing in this country about the beginning of April, and returning to a warmer climate at the end of summer. It is common in some of the southern counties of England, but never visits the northern or western parts. During our winter months it is found in the northern parts of Africa, and is at all times to be met with in India, Persia, China, and Japan, where it is even more esteemed for its song than in Britain.

The note of the nightingale is very pleasing,—the more so, perhaps, as it is often heard at a time when all the other songsters of the woods are hushed in silence. When she begins her song, the notes are at first soft and gentle; but they gradually swell from simple notes to the wildest warblings; and nothing can be more delightful than to listen in the stillness of night to the rich melody of this sweet songster.

THE NIGHTINGALE.

Up this green woodland path we'll softly rove,
And list the nightingale: she dwelleth here.
Hush! let the wood-gate gently close, for fear
Its noise might scare her from her home of love.
Here I have heard her sing for many a year,
At noon and eve, ay, all the livelong day,
As though she lived on song. In this same spot,
Just where the old-man's-beard all wildly trails
Its tresses o'er the track and stops the way,
And where that child the fox-glove flowers hath got,
Laughing and creeping through the moss-grown rails.
Oft have I hunted, like a truant boy,
Creeping through thorny brakes with eager joy,

To find her nest and see her feed her young:
And where those crimpled ferns grow rank among
The hazel boughs, I've nestled down full oft,
To watch her warbling on some spray aloft,
With wings all quivering in her ecstasy,
And feathers ruffling up in transport high,
And bill wide open—to relieve her heart
Of its out-sobbing song!—But with a start,
If I but stirred a branch, she stopt at once,
And, flying off swift as the eye can glance,
In leafy distance hid, to sing again.
Anon, from bosom of that green retreat,
Her song anew in silvery stream would gush,
With *jug-jug-jug* and quavered trilling sweet;
Till, roused to emulate the enchanting strain,
From hawthorn spray piped loud the merry thrush
Her wild bravura through the woodlands wide.

Clare.

8.—THE GOLDFINCH.

THE goldfinch is a beautiful little bird, about five and a half inches in length. Its plumage is of a rich scarlet, mingled with deep black, white, and yellow. It is remarkable for the neatness with which it builds its nest; the outside consisting of very fine moss, curiously interwoven with wool, hair, and other materials; and the inside lined with the soft down of thistles and other delicate substances. The nest of the goldfinch is often found in orchards and gardens, built in a tree or thick evergreen shrub. It is literally a cradle, and the young birds are rocked in it by the winds nearly as much as they are to be afterwards

on the tall and flexible stems on which they are to find their food. The goldfinch is often seen feeding on the seeds of the thistle; and its fondness for this plant is such that it is sometimes called the "thistle-finch." It also feeds on the downy seeds of various other plants, and is therefore regarded with favour by the farmer, who is greatly indebted to this and various other members of the finch family for preventing his land from being overgrown with weeds.

THE GOLDFINCH.

With equal art externally disguised,
But of internal structure passing far
The feather'd concaves of the other tribes,
The goldfinch weaves, with willow down inlaid
And cannach tufts, his wonderful abode.
Sometimes, suspended at the limber end
Of plane-tree spray, among the broad-leaved shoots,
The tiny hammock swings to every gale;
Sometimes in closest thickets 'tis conceal'd;
Sometimes in hedge luxuriant, where the brier,
The bramble, and the crooked plum-tree branch,
Warp through the thorn, surmounted by the flowers
Of climbing vetch and honeysuckle wild,
All undefaced by Art's deforming hand.
But mark the pretty bird himself! How light
And quick is every motion, every note!
How beautiful his plumes, his red-tinged head,
His breast of brown! and see him stretch his wing,—
A fairy fan of golden spokes it seems.
Oft on the thistle's tuft he, nibbling, sits,
Light as the down; then, 'mid a flight of downs,
He wings his way, piping his shrillest call. *Grahame.*

THE GOLDFINCH.

"Goldfinch! pride of woodland glade,
In thy jet and gold array'd!
Gentle bird, that lov'st to feed
On the thistle's downy seed!
Freely frolic, lightly sing,
In the sunbeam spread thy wing.
Spread thy plumage, trim and gay,
Glittering in the noontide ray,
As upon the thorn-tree's stem
Perch'd, thou sipp'st the dewy gem.
Fickle bird, for ever roving,
Endless changes ever loving;
Now in orchards gaily sporting,
Now to flowery fields resorting;
Chasing now the thistle's down,
By the gentle zephyrs blown;
Lightly on thou win'st thy way,
Always happy, always gay."

9.—THE BULLFINCH.

THE bullfinch is common in every part of Britain. It is a bird about the size of a sparrow, with a fine glossy black head and wings, and a red breast.

The usual haunts of the bullfinch in summer are the woods and thickets. It also frequents our orchards and gardens in spring; but it is no favourite with the gardener, by whom it is regarded as one of the most pernicious of the feathered race, being very destructive to the tender buds of trees.

The wild note of the bullfinch is a soft, long twitter; but when tamed, it becomes remarkably docile, and is easily taught to whistle musical airs.

THE BULLFINCH.

Deep in the thorn's entangled maze,
Or where the fruit-tree's thickening sprays
Yield a secure and close retreat,
The dusky bullfinch plans her seat.
There where you see the clustered boughs
Put forth the opening bud, her spouse,
With mantle gray, and jet-like head,
And flaming breast of crimson red,
Is perched, with hard and hawk-like beak,
Intent the embryo fruit to seek;
Nor ceases from his pleasing toil,
The orchard's budding hope to spoil,
Unless, with quick and timid glance
Of his dark eye, your dread advance
He notice, and your search evade,
Hid in the thicket's pathless shade.

Mant.

10.—THE LINNET.

THE linnet is a well known song bird, common in every part of Europe. It is about five inches and a half in length, and the general colour of its plumage is a reddish brown, tipped here and there with white.

The song of the linnet is lively and varied, and its manners and disposition very gentle. "It delights and lives in society, frequenting open commons and grassy

fields, where several pair, without the least rivalry or contention, will build their nests, and rear their offspring in the same neighbourhood, twittering and warbling all the day long. This duty over, the families unite, feeding and moving in company, as one united household, and resorting to the top of some sunny tree, they will pass hours in the enjoyment of the warmth, chattering with each other in a low and gentle note. They will thus regularly assemble during any occasional bright gleam throughout all the winter season, and 'still their voice is song;' which, heard at a little distance, forms a pleasing and joyous concert. The linnet is the cleanliest of birds, delighting to dabble in the water and dress its plumage in every little rill that runs by."

When whinny braes are garlanded with gold,
And, blithe, the lamb pursues, in merry chase,
His twin around the bush; the linnet then,
Within the prickly fortress builds her bower,
And warmly lines it round with hair and wool
Inwove. Sweet minstrel! may'st thou long delight
The whinny knowe, and broomy brae, and bank
Of fragrant birch! May never fowler's snare
Tangle thy struggling foot!

Grahame.

11.—THE BLACKBIRD.

THE blackbird is a well known song bird, about ten inches long, with plumage of the deepest black. It frequents woods and thickets, and feeds on berries, fruit, insects, and worms. Its song during the spring and summer is rich and enlivening.

THE BLACKBIRD.

When snowdrops die, and the green primrose leaves,
Announce the coming flower, the blackbird's note,
Mellifluous, rich, deep-toned, fills all the vale,
And charms the ravish'd ear. The hawthorn bush,
New-budded, is his perch. There the gray dawn
He hails; and there, with parting light, concludes
His melody. There when the buds begin
To break, he lays the fibrous roots; and, see,
His jetty breast embrown'd,—the rounded clay
His jetty breast has soil'd: but now complete,
His partner, and his helper in the work,
Happy assumes possession of her home;
While he, upon a neighbouring tree, his lay,
More richly full, melodiously renews.
When twice seven days have run, the moment snatch
That she has flitted off her charge, to cool
Her thirsty bill, dipt in the babbling brook;
Then silently, on tiptoe raised, look in,
Admire: five cupless acorns, darkly speeked,
Delight the eye, warm to the cautious touch.
In seven days more expect the fledgeless young,—
Five gaping bills. With busy wing, and eye
Quick-darting, all alert, the parent pair
Gather the sustenance which Heaven bestows.
But music ceases, save at dewy fall
Of eve, when, nestling o'er her brood, the dam
Has still'd them all to rest: or at the hour
Of doubtful dawning gray; then from his wing
Her partner turns his yellow bill, and chants
His solitary song of joyous praise.

Grahame.

THE BLACKBIRD.

MORNING.

Golden bill! golden bill!
Lo, the peep of day!
All the air is cool and still,—
From the elm-tree on the hill
Chant away:
While the moon drops down the west,
Like thy mate upon her nest;
And the stars before the sun
Melt, like snow-flakes, one by one:
Let thy loud and welcome lay
Pour along
Few notes, but strong.

EVENING.

Jet-bright wing! jet-bright wing!
Flit across the sunset glade;
Lying there in wait to sing,
Listen with thy head awry,
Keeping tune with twinkling eye,
While from all the woodland glade
Birds of every plume and note
Strain the throat,
Till both hill and valley ring,
And the warbled minstrelsy
Ebbing, flowing, like the sea,
Claims brief interludes for thee:
Then with simple swell and fall,
Breaking beautiful through all,
Let thy Pan-like pipe repeat
Few notes, but sweet!

12.—THE THRUSH.

THE thrush is about nine inches in length. The general colour of its plumage is yellowish brown, spotted with white. It is a bird of great service in a garden where wall-fruit is grown, as it feeds largely on snails; and though it will frequently regale itself with a tempting gooseberry or a bunch of currants, its services entitle it to a very ample reward.

In France this bird visits Burgundy when the grapes are ripe, and commits great ravages among the vineyards.

The song of the thrush is much admired for its sweetness and variety. It is heard early in the spring, and continues till the beginning of autumn.

THE THRUSH.

Within a thick and spreading hawthorn bush
That overhung a molehill large and round,
I heard, from morn to morn, a merry thrush
Sing hymns to sunrise, while I drank the sound
With joy;—and often, an intruding guest,
I watch'd her secret toils, from day to day,
How true she warp'd the moss to form her nest,
And modelled it within with wood and clay.
And by-and-by, like heath-bells gilt with dew,
There lay her shining eggs as bright as flowers,
Ink-spotted-over shells of green and blue;
And there I witness'd, in the summer hours,
A brood of nature's minstrels chirp and fly,
Glad as the sunshine and the laughing sky.

Clare.

THE THRUSH.

The winter solstice scarce is past,
  Loud is the wind, and hoarsely sound
The mill-streams in the swelling blast,
  And cold and humid is the ground;
When to the ivy that embowers
  Some pollard tree, or shelt'ring rock,
  The troop of timid warblers flock,
And shuddering wait for milder hours:

While thou! the leader of their band,
  Fearless salut'st the opening year;
Nor stay'st till blow the breezes bland
  That bid the tender leaves appear!
But on a towering elm or pine,
  Waving elate thy dauntless wing,
  Thou joy'st thy love-notes wild to sing,
Impatient of St. Valentine!

Go, herald of the spring! while yet
  No harebell scents the woodland lane,
Nor starwort fair, nor violet
  Braves the bleak gust and driving rain;
'Tis thine, as through the copses rude
  Some passive wanderer sighs along,
  To soothe him with a cheerful song,
And tell of hope and fortitude!

For thee, then, may the hawthorn bush,
  The elder, and the spindle-tree,
With all their various berries blush,
  And the blue sloe abound for thee.

For thee the coral holly glow
  Its arm'd and glossy leaves among;
  And many a branched oak be hung
With the pellucid mistletoe!

Still may thy nest, with lichen lined,
  Be hidden from the invading jay;
Nor truant boy its covert find,
  To bear thy callow young away.
So thou, precursor still of good,
  Oh! herald of approaching spring!
  Shalt to the pensive wanderer sing
Thy song of hope and fortitude!

Charlotte Smith.

13.—THE WREN.

THE wren is a bird about three inches and a half in length, with a light brownish plumage, crossed with lines of a darker colour.

Like the red-breast, the wren enlivens our winters with its song. "During the winter season this brisk little warbler may be seen amid icicles, which hang from the bare roots of shrubs and trees, and on the banks of rivulets. It sings till late in the evening, and not unfrequently during a fall of snow."

THE WREN.

The wren through winter's gloomy hours
Sings cheerily; nor yet hath lost
His blitheness, chilled by pinching frost;
Nor yet is forced for warmth to cleave
To caverned nook or straw-built eave.

Sing, little bird! sing on! designed
A lesson for our anxious kind,—
That we, like thee, with hearts content,
Enjoy the blessings God hath sent;
His bounty trust, perform his will,
Nor antedate uncertain ill.
Beside the red-breast's note, one other strain,
One summer-strain in wintry days is heard:
Amid the leafless thorn the merry wren,
When icicles hang dripping from the rock,
Pipes her perennial lay: even when the flakes
Broad on her pinions fall, she lightly flies
Athwart the shower, and sings upon the wing.

Grahame.

SPELLING LESSONS

TO PART IV.

I.

Feath'-ered, clothed or covered with feathers.
Spe'-cies, kinds.
Va'-ry-ing, differing.
Ex-hib'-it-ing, showing.
Plum'-age, feathers.
An'-i-mat-ed, living.
Love'-li-est, most beautiful.
El'-e-gance, beauty, grace.
Scent'-ed, having smell.
Ex-tract', to draw out.
Lurk, hide.
Re-cess'-es, the innermost corners.
In'-tri-ca-cy, irregularity.
At-trac'-tion, something having the power of drawing to.
Daz'-zling, striking with splendour.
Vis'-i-ble, that may be seen.
Mi-nut'-est, smallest.
Com-bined', united; joined together.
De-signed', intended; planned.
Com-prise', include.
E-pit'-o-me, abridgment.
Bur'-nished, bright; polished.
Ru'-by, red.
Viv'-id, bright.
Em'-e-rald, bright green.
Lu'-cid, shining.
Hal'-cy-on, quiet; still.
Ge'-ni-al, enlivening.
Spon-ta'-ne-ous, acting of themselves.
Tam'-a-rind, the name of a tree.
Un-fail'-ing, never fading.
Am-bro'-si-al, delicious.
Flut'-ter-ing, moving the wings rapidly.
Glow'-ing, shining brightly.
Mo-lest', trouble.
Tim'-id, fearful.
Change'-ful, ever changing.
Gau'-dy, showy.
Con'-scious, felt.
Pal-met'-to, the name of a tree.
Ver'-dant, green.
Mo'-ra, the name of a tree.
Cay'-man, crocodile.
Joy'-ful-ness, gladness.

II.

A-void'-ing, shunning.
Cush'-ion, a pillow.
For-get'-ful, neglecting.
Triv'-i-al, trifling.
Pul'-let, a young hen.
Un-der-stand'-ing, the power of knowing.
Con-cealed', hid.
Veg'-e-ta-ble, plant.
In-creas'-ing, making greater.
Pur-su'-er, one who chases.
Af-ford'-ed, gave; yielded.
Stretched', spread.
Val'-ued, prized.
Un-pre-pared', undressed.
Mot'-to, a sentence or word added to a device.
Con'-quer-or, one who overcomes.
Rep-re-sen-ta'-tion, image; resemblance.
Whit'-ened, made white.
Mim'-ic, to imitate.

III.

Min'-strel, a singer.
Tor'-rent, flood.
Re-sound', to echo.
Bough, branch of a tree.
Lus'-ty, stout.

Thros'-tle, thrush.
Ac-cord', agree.
Tur'-tle, a kind of dove.
De-light'-ful, pleasant.
Love'-li-ness, beauty.
Joc'-und, gay, merry.
In-de-pen'-dent, not relying on others; free.
Glad'-some, delighted.
Re-strain', hold back; confine.
In-dig'-nant, angry.
Vi'-cious, wicked.
Be-sprent', sprinkled over.

IV.

Fa'-vour-ite, beloved.
As-so'-ci-at-ed, joined.
Fa-mil-i-ar'-i-ty, easy freedom.
Coax'-ing, flattering.
Fear'-less, without fear.
Con'-fi-dence, trust; boldness.
Ad-mis'-sion, entrance.
A-lights', comes down.
As-kance', sideways.
A-sy'-lum, place of retreat.
Par-tak'-er, sharer.
Se-ver'-i-ty, rigour.
Ac-com-mo-da'-tion, fit dwelling.
In-ter-mixed', mingled.
En-li'-ven-ing, gladdening; cheering.
A-dieu', farewell.
Un-re-joic'-ing, dismal; sad.
Coun'-sel, consultation.
Dis-dain'-ful, scornful.
Twit'-ter-ing, making a sharp tremulous noise.
Taunt'-ing, scoffing, mocking.
House'-hold, belonging to a house.
Ob-scure', unknown.
Im-pa'-tient, eager; restle
Short'-en-ing, lessening.
Re-signed', submitting.

V.

Me-lo'-di-ous, musical.
In-ter-rupt'-ed, broken.
Wil'-der-ness, an uncultivated tract.
Blithe'-some, cheerful.
Mat'-in, morning song.
Lea, a meadow; a plain.
Em'-blem, a picture; a sign.
En'-er-gy, power; force.
Sheen, bright.
Cloud'-let, little cloud.
Cher'-ub, a heavenly spirit.
Gloam'-ing, twilight.

VI.

Beau'-te-ous, fair; beautiful.
De-light'-ful, charming.
Vis'-i-tant, visitor.
Im'-i-tates, copies.
So'-ci-al, in company.
De-pos'-its, lays down.
Dis-cern'-ing, knowing.
Dis-re-gard'-ed, neglected.
Op-er-a'-tion, working.
Fac'-ul-ty, power.
Be-stowed', given; conferred.
Re-venge', to return an injury.
U-surp'-er, one who holds without right.
Un-ex-pect'-ed, not looked for.
Sym'-pho-ny, harmony of sounds.
Pin'-ion, wing.
Young'-ling, a young animal.
Des'-tined, doomed.
Sup-plant', to displace by stratagem.
Mo-not'-o-nous, wanting variety of sound.
Jour'-ney-ing, travelling.
In-nu'-mer-ous, too many to be counted.

VII.

Ap-pear'-ing, being seen.
List, listen to.
Live'-long, long in passing.
Trail, to draw along the ground.
Tru'-ant, idle; absent from duty.
Crim'-pled, plaited.
Ha'-zel, the name of a shrub.
Nes'-tle, to lie close.
Ec'-sta-sy, excessive joy; rapture.
Trans'-port, state of rapture.
Re-lieve', to ease.
A-non', quickly; soon.
Qua'-ver, to shake the voice.
Trill'-ing, trickling, (here applied to sound.)
Em'-u-late, rival.
En-chant'-ing, charming.

Bra-vu'-ra, a song requiring great power of voice.

VIII.

Cu'-ri-ous-ly, artfully.
In-ter-wov'-en, woven together.
Flex'-i-ble, easily bent.
In-debt'-ed, obliged.
Ex-ter'-nal-ly, outwardly.
Dis-guised', hidden by a false appearance.
In-ter'-nal, inside.
Con'-cave, a hollow, (here used poetically for nests.)
Sus-pend'-ed, hung.
Lim'-ber, flexible.
Ham'-mock, a swinging bed.
Lux-u'-ri-ant, rich in growth.
Sur-mount'-ed, risen above.
Hon'-ey-suc-kle, woodbine.
Un-de-faced', not disfigured.
De-form'-ing, spoiling the form.
Re-sort'-ing, going to.
Zeph'-yr, a soft wind.

IX.

Per-ni'-cious, destructive.
Doc'-ile, easily taught.
En-tan'-gled, twisted.
Maze, labyrinth.
Dus'-ky, dull-coloured.
In-tent', eager.
Em'-bry-o, in the earliest stage.
E-vade', avoid.

X.

Dis-po-si'-tion, temper.
Fre-quent'-ing, visiting often.
Ri'-val-ry, competition.
Con-ten'-tion, strife.
Neigh'-bour-hood, place near; vicinity.
As-sem'-ble, to meet together.
Oc-ca'-sion-al, occurring at times.
Dab'-ble, to play in water.
Whin'-ny, abounding with whins; furze.
Brae (Scotch), slope.
Blithe, joyous
In-wove', woven together.
Knowe (Scotch), knoll; a hillock.
Tan'-gle, insnare.

XI.

En-li'-ven-ing, gladdening.
An-nounce', proclaim.
Mel-lif'-lu-ous, flowing with sweetness.
Rav'-ished, exceedingly delighted.
Fi'-brous, full of fibres.
Cau'-tious, careful.
Fledge'-less, without feather.
A-lert', brisk.
Sus'-te-nance, food.
A-wry', sideways.
In'-ter-lude, a piece performed during the intervals of a play.

XII.

Re-gale', refresh; feast.
En-ti'-tle, give a title to.
Rav'-age, waste; ruin.
In-trud'-ing, uninvited and unwelcome.
Warped, twisted.
Mod'-elled, shaped.
Win'-ter sol'-stice, the shortest day.
Pol'-lard-tree, a tree lopped.
E-late', proud.
Daunt'-less, fearless.
Hare'-bell, a flower.
Star'-wort, a plant.
Bleak, cold; dreary.
Pas'-sive, suffering.
Soothe, to calm.
For'-ti-tude, courage.
Pel-lu'-cid, transparent; clear.
Mis'-tle-toe, a plant which grows on trees.
Lich'-en, a plant.
Cov'-ert, shelter.
Cal'-low, naked; unfledged.
Pre-cur'-sor, forerunner.

XIII.

Cav'-erned, hollow.
An-te-date', to date before the real time.
Per-en'-ni-al, perpetual.
A-thwart', across.

MISCELLANEOUS PIECES.

1.—MY FATHER'S AT THE HELM.

THE curling waves, with awful roar,
A little boat assailed;
And pallid fear's distracting power
O'er all on board prevailed:

Save one, the captain's darling child,
Who steadfast viewed the storm;
And cheerful, with composure, smiled
At danger's threatening form.

"And sport'st thou thus," a seaman cried,
"While terrors overwhelm?"—
"Why should I fear?" the boy replied;
"My father's at the helm!"

So when our worldly all is reft,
Our earthly helper gone,
We still have one true anchor left—
God helps, and He alone.

He to our prayers will bend an ear,
He gives our pangs relief;
He turns to smiles each trembling tear,
To joy each torturing grief.

Then turn to Him, 'mid sorrows wild,
When want and woes o'erwhelm;
Remembering, like the fearless child,
Our Father's at the helm.

ANON.

2.—THE ORPHAN GIRL.

I HAVE no mother! for she died
When I was very young;
But still her memory round my heart
Like morning mists has hung.

They tell me of an angel form,
That watched me while I slept,
And of a soft and gentle hand
That wiped the tears I wept:

And that same hand that held my own
When I began to walk,
The joy that sparkled in her eyes
When first I tried to talk.

They say the mother's heart is pleased
When infant charms expand;
I wonder if she thinks of me
In that bright, happy land.

I know she is in heaven now,
That holy place of rest;
For she was always good to me,—
The good alone are blest.

I remember, too, when I was ill,
She kissed my burning brow;
The tear that fell upon my cheek—
I think I feel it now.

And I have got some little books,
She taught me how to spell;
The chiding or the kiss she gave
I still remember well.

And then she used to kneel with me,
And teach me how to pray,
And raise my little hands to heaven,
And tell me what to say.

O mother, mother! in my heart
Thy image still shall be;
And I will hope in heaven at last
That I may meet with thee.

ANON.

3.—THE ORPHAN BOY.

Stay, lady, stay, for mercy's sake,
  And hear a helpless orphan's tale!
Ah! sure my looks must pity wake!
  'Tis want that makes my cheek so pale.
Yet I was once a mother's pride,
  And my brave father's hope and joy;
But in the Nile's proud fight he died,
  And I am now an orphan boy.

Poor foolish child! how pleased was I,
  When news of Nelson's victory came,
Along the crowded streets to fly,
  And see the lighted window's flame!
To force me home my mother sought,
  She could not bear to see my joy;
For with my father's life 'twas bought,
  And made me a poor orphan boy.

The people's shouts were long and loud;
  My mother shuddering closed her ears!
"Rejoice! rejoice!" still cried the crowd;
  My mother answered with her tears.
"Oh! why do tears steal down your cheek,"
  Cried I, "while others shout for joy?"
She kissed me, and in accents weak,
  She called me her poor orphan boy.

"What is an orphan boy?" I said,
  When suddenly she gasped for breath;
And her eyes closed;—I shrieked for aid,—
  But, ah! her eyes were closed in death!
My hardships since I will not tell;
  But now no more a parent's joy—
Ah, lady! I have learnt too well,
  What 'tis to be an orphan boy.

O were I by your bounty fed!—
  Nay, gentle lady, do not chide!
Trust me, I mean to earn my bread;
  The sailor's orphan boy has pride.
Lady, you weep:—what is't you say?
  You'll give me clothing, food, employ?—
Look down, dear parents! look and see,
  Your happy, happy orphan boy.

Opie.

4.—THE PET LAMB.

THE dew was falling fast, the stars began to blink;
I heard a voice; it said, "Drink, pretty creature, drink!"
And, looking o'er the hedge, before me I espied
A snow-white mountain lamb with a maiden at its side.

No other sheep were near, the lamb was all alone,
And by a slender cord was tethered to a stone;
With one knee on the grass did the little maiden kneel,
While to that mountain lamb she gave its evening meal.

The lamb, while from her hand he thus his supper took,
Seemed to feast with head and ears; and his tail with pleasure shook.
"Drink, pretty creature, drink," she said in such a tone
That I almost received her heart into my own.

'Twas little Barbara Lewthwaite, a child of beauty rare!
I watched them with delight; they were a lovely pair.
Now with her empty can the maiden turned away;
But ere ten yards were gone her footsteps did she stay.

Towards the lamb she looked; and from that shady place
I unobserved could see the workings of her face:
If Nature to her tongue could measured numbers bring,
Thus, thought I, to her lamb that little maid might sing:—

"What ails thee, young one? What? Why pull so at thy cord?
Is it not well with thee? Well both for bed and board?
Thy plot of grass is soft, and green as grass can be;
Rest, little young one, rest; what is't that aileth thee?

What is it thou wouldst seek? What is wanting to thy heart?
Thy limbs, are they not strong? And beautiful thou art:
This grass is tender grass; these flowers they have no peers;
And that green corn all day is rustling in thy ears!

If the sun be shining hot, do but stretch thy woollen chain,
This beech is standing by, its covert thou canst gain;
For rain and mountain storms! the like thou need'st not fear—
The rain and storm are things which scarcely can come here.

Rest, little young one, rest; thou hast forgot the day
When my father found thee first in places far away;

Many flocks were on the hills, but thou wert owned by none;
And thy mother from thy side for evermore was gone.

He took thee in his arms, and in pity brought thee home:
A blessed day for thee! then whither wouldst thou roam?
A faithful nurse thou hast; the dam that did thee yean
Upon the mountain-tops no kinder could have been.

Thou know'st that twice a day I have brought thee in this can
Fresh water from the brook, as clear as ever ran;
And twice in the day, when the ground is wet with dew,
I bring thee draughts of milk, warm milk it is, and new.

Thy limbs will shortly be twice as stout as they are now;
Then I'll yoke thee to my cart, like a pony in the plough:
My playmate thou shalt be; and when the wind is cold
Our hearth shall be thy bed, our house shall be thy fold.

It will not, will not rest!—poor creature, can it be
That 'tis thy mother's heart which is working so in thee?
Things that I know not of belike to thee are dear,
And dreams of things which thou canst neither see nor hear.

Alas, the mountain-tops that look so green and fair!
I've heard of fearful winds and darkness that come there;
The little brooks that seem all pastime and all play,
When they are angry, roar like lions for their prey.

Here thou need'st not dread the raven in the sky;
Night and day thou art safe,—our cottage is hard by.
Why bleat so after me? Why pull so at thy chain?
Sleep,—and at break of day I will come to thee again!"

—As homeward through the lane I went with lazy feet,
This song to myself did I oftentimes repeat;
And it seemed, as I retraced the ballad line by line,
That but half of it was hers, and one-half of it was *mine*.

Again, and once again, did I repeat the song:
"Nay," said I, "more than half to the *damsel* must belong;
For she looked with such a look, and she spake with such a tone,
That I almost received her heart into my own."

WORDSWORTH.

5.—WE ARE SEVEN.

I MET a little cottage girl:
  She was eight years old, she said;
Her hair was thick with many a curl
  That clustered round her head.

She had a rustic, woodland air,
  And she was wildly clad;
Her eyes were fair, and very fair;
  —Her beauty made me glad.

"Sisters and brothers, little maid,
  How many may you be?"—
"How many? Seven in all," she said,
  And, wondering, looked at me.—

"And where are they? I pray you tell."-
  She answered, "Seven are we;
And two of us at Conway dwell,
  And two are gone to sea.

Two of us in the church-yard lie,
  My sister and my brother;
And, in the church-yard cottage, I
  Dwell near them with my mother."-

"You say that two at Conway dwell,
  And two are gone to sea,
Yet ye are seven!—I pray you tell,
  Sweet maid, how this may be?"—

Then did the little maid reply,
  "Seven boys and girls are we;
Two of us in the church-yard lie,
  Beneath the church-yard tree."—

"You run about, my little maid,
  Your limbs they are alive;
If two are in the church-yard laid,
  Then ye are only five."—

"Their graves are green, they may be seen,
  The little maid replied,
"Twelve steps or more from my mother's door,
  And they are side by side.

My stockings there I often knit,
My kerchief there I hem;
And there upon the ground I sit—
I sit and sing to them.

And often after sunset, sir,
When it is light and fair,
I take my little porringer,
And eat my supper there.

The first that died was little Jane;
In bed she moaning lay,
Till God released her of her pain;
And then she went away.

So in the church-yard she was laid;
And all the summer dry,
Together round her grave we played,
My brother John and I.

And when the ground was white with snow,
And I could run and slide,
My brother John was forced to go,
And he lies by her side."—

"How many are you, then," said I,
"If they two are in heaven?"—
The little maiden did reply,
"O master! we are seven."—

"But they are dead; those two are dead!
Their spirits are in heaven!"—
'Twas throwing words away: for still
The little maid would have her will,
And said, "Nay, we are seven!"

WORDSWORTH.

6.—MY COUNTRY'S PLEASANT STREAMS.

In joy and gladness on ye go,
My country's pleasant streams;
And oft through scenes as fair ye flow
As bless the poet's dreams.
From hills where stately forests rear
Their heads the breeze to brave,
From dark morass, or fountain clear,
You roll to ocean's wave.

The noble lakes your strength supply,
And now the crystal spring,
Where, undisturbed, the wild-birds fly,
Or bathe the weary wing.
Through narrow gorges here you foam,
There down the valley rove,
Like youths who leave a quiet home,
The world's delights to prove.

A thousand ceaseless hymns of praise,
With music in each tone,
In mystic harmony you raise,
And heard by God alone.
But though to us it is not given
The blended song to know,
Sweet sounds, that have the air of heaven,
Delight us as ye go.

The granite cliff its shadow flings
Far down into the tide;
To deck your banks the flow'ret springs,
And [illegible]ents you as ye glide.
As through the spreading intervales
Your devious course you steer,
The waving grain your passage hails,
And flocks and herds appear.

And there the graceful elms are found--
Your own peculiar tree;
And there stout-hearted men abound—
The happy and the free.
And childhood's merry laugh is heard
Along the hills to float,
As, by the gentle breezes stirred,
You waft his tiny boat.

Where youthful forms at eve repose,
And tales of passion tell,
While Beauty's cheek more beauteous grows,
And snowy bosoms swell;
In joy and gladness there ye go,
My country's pleasant streams;
And oft through scenes as fair ye flow
As bless the poet's dreams.

HON. JOSEPH HOWE.