motto. Students should be taught in the incipient stages of instruction, not only *what* to study, but *how* to study.

Visible illustrations are analogous to practical life. Learn *things*, and *then* the *names* of things. Proceed from concretion to abstraction. Every scholar should be taught to use his eyes as he is passing through the world. We acquire definite knowledge by comparison and observation. To a child who has never seen a river, show him a brook or a rivulet; inform him that a river is many times larger than a brook, and that rivers are of various sizes. If he has a vague idea of a lake, tell him it is a large pond, and contains many times more space. To give one a definite idea of the shape of the earth which he inhabits, show him a globe, and give it a rotary motion. He will then easily comprehend what is meant by the revolution of the earth on its axis. The impressions communicated through the medium of the eye are lasting. I would, therefore, urge upon every teacher the importance of visible illustration in all the departments of teaching. In teaching the English alphabet, put a perfect form of the letter on the blackboard. Let it be imitated by writing, and carefully compared with the same letter printed in books.

"Teach one thing at a time," should be the teacher's maxim; analyze fully one principle before another is presented. Apply knowledge as fast as it is acquired. Convince a scholar of the value of useful knowledge, excite in him a desire to obtain it, furnish him the means of comprehending and unravelling difficulties, and he will soon learn to originate, treasure up, classify, and digest whatever he has acquired.—*Massachusetts Teacher—Report of Mr. D. H. Sanborn.*

Youths' Department.

THE COMING-IN OF SPRING.

The voice of Spring,—the voice of Spring,
I hear it from afar!
He comes with sunlight on his wing,
And ray of morning star.
His impulse thrills through rill and flood,
It throbs along the main,—
'Tis stirring in the waking wood,
And trembling o'er the plain.

The cuckoo's call from hill to hill,
Announces he is nigh;
The nightingale has found the rill
She loved to warble by;
The thrush to sing is all athirst,
But will not till he see
Some sign of him,—then out will burst
The treasured melody!

He comes, he comes! Behold, behold!
That glory in the east,
Of burning beams of glowing gold,
And light by light increased!
The heavy clouds have rolled away
That darkened sky and earth,
And blue and splendid breaks the day,
With universal mirth.

Already to the skies the lark
Mounts fast on dewy wings—
Already, round the heaven, hark,
His happy anthem rings—
Already, earth unto her heart
Inhales the genial heat—
Already see the flowers start—
To beautify his feet!

The violet is sweetening now
The air of hill and dell;
The snow-drops that from Winter's brow
As he retreated fell,
Have turned to flowers, and gem the bowers
Where late the wild storm whirled;
And warmer rays, with length'ning days,
Give verdure to the world.

The work is done;—but there is One
Who hath the task assigned,—
Who guides the serviceable sun,
And gathers up the wind,—
Who showers down the needful rain
He measures in his hand,—
And rears the tender-springing grain,
That life may fill the land.

The pleasant Spring, the joyous Spring!
His course is onward now;
He comes with sunlight on his wing,
And beauty on his brow;
His impulse thrills through rill and flood,
It throbs along the main—
'Tis stirring in the waking wood,
And trembling o'er the plain.

[Cornelius Webbe.

ILLUSTRATIONS OF ASTRONOMY.

No. 3.—Distance, Measurement, Light and Heat of the Planets.

How infinite are the amplitudes of space! It has never been measured. Man, with all his inventive genius, can produce no instrument to encircle the universe. He can only contemplate its vast grandeur, its silent sublimity, and then in his insignificance, apply the tiny inventions of his own fancy—his unappreciable and intangible estimates of miles, degrees and circles, to approximate even in his own mind, to the magnificent distances of the planets from each other and their sister earth. To realise fully the extent of space in the celestial world above us is impossible. We can at once comprehend the extent of a mile, or 100 miles, and in a slight degree, 10,000, or 20,000 miles upon the earth's surface, but when the mind's eye is called upward to follow the astronomical explorer of millions, or hundreds of millions of miles, how futile are even its eagle efforts, how dimmed and faded its lustre, how weary its languor, and how child-like it turns to earth again, and by its terrestrial standards of vision seeks to gaze upon the universe.

In the science of Astronomy, therefore, we can only estimate space by the certain conventional and fixed distances. As these should be accurately known, we give a list and definition of those used in popular and scientific astronomy.

Degrees, Minutes, and Seconds explained.—In astronomy, the distances and magnitude of bodies are often given in *degrees, minutes*, and *seconds*. It will be necessary, therefore, to show what these mean.

"A *circle* is a *plane figure*, comprehended by a single curve line, called its *circumference*, every part of which is equally distant from the point within called its *centre*." A circle is represented on Map 3, at the right of Fig. 1.

A *quadrant* is the fourth part of a circle.

A *sextant* is the sixth part of a circle.

A *sign* is the twelfth part of a circle.

A *degree* is the thirtieth part of a sign, or one three hundred and sixtieth part of a circle.

A *minute* is a sixtieth part of a degree; and

A *second* is the sixtieth part of a minute.

On the map the circle is divided off into parts of ten degrees each, and numbered in figures every thirty degrees, or oftener. It will be seen that one-fourth of a circle contains just *three signs*, or *ninety degrees*; and half a circle *six signs*, or *one hundred and eighty degrees*.

All circles, whether great and small, have the same number of degrees, namely, three hundred and sixty. But one hundred and eighty marks the greatest possible angle, as a pair of compasses can be opened no farther than to bring the legs in a straight line. These degrees, &c., are used to represent the angle which the two lines form, coming from different points, and meeting at the eye in the centre.

In the figure, the lines passing from the stars on the left to the eye, are found by the measurement on the circle to be ten degrees apart. If the dotted line was perpendicular to the lower or plain one, they would be ninety degrees apart, &c.

Degrees, minutes, and seconds are denoted by certain characters, as follows: ° denotes degrees, ′ denotes minutes, and ″ denotes seconds. Thus, 10° 15′ 20″, is read ten degrees, fifteen minutes, and twenty seconds.

Measurement by degrees, minutes, and seconds, is called *Angular Measurement.*

Angular distances, magnitudes, &c.—In Fig. 1, the observer is represented as seeing two stars on the left side of the map. By looking at the graduated or divided circle, it will be seen that the angle which these two stars make at the eye is 10°. The stars are therefore said to be 10° apart. If a globe filled the same angle, or number of degrees, as shown on the map, we should say it was 10° in diameter. If the space between the foot of a mountain and its top filled the same angle, we should say it was 10° high; and if a comet passed through the same angle in one hour, we should say its velocity was 10° an hour.