

there is no enjoyment, as those who suffered and enjoyed upon earth like none others? Who will know so fearfully, and learn so rapidly, as those who had followed hard after all knowledge but that of God? Alas, alas, for unsanctified genius!—Hogg's Instructor.

Youths' Department.

"WHY DO THE FLOWERS BLOOM, MOTHER?"

BY J. E. CARPENTER.

"Why do the flow'rets bloom, mother,
Why do the sweet flowers bloom;
And brightest those we rear'd, mother,
Around my brother's tomb?"
To fill the world with gladness,
My child, were flow'rets given,—
To crown the earth with beauty,
And show the road to Heaven!"

"Then why do the flow'rets fade, mother,
Why do the sweet flowers fade,
When winter's dreary cloud, mother,
Earth's brighter scenes pervade?
My child, those flow'rs that wither,
Have seeds that still remain,
That the sunshine and the summer
Restore to life again!"

"And shall not those that die, mother,
Come back to life once more,
E'en as the rain and sun, mother,
Those beauteous flow'rs restore?"
Yes,—yes, my child, such powers
To human flow'rs are given,
Here earth's frail flow'rs may blossom,
But we may rise—in Heaven!"

ILLUSTRATIONS OF ASTRONOMY.

No. 4.

PHYSICAL CONSTITUTION AND APPEARANCE OF THE SUN AND PLANETS.

To measure the celestial bodies is almost as great and difficult a task as to measure their distances from each other. The ingenuity and skill, with which man has been endowed by his Creator, have, however, enabled him to accomplish the one with as much accuracy and precision as he has approximated to the other.

Physical Constitution of the Sun.—Concerning the physical nature of the sun, very little is known. As before said, it appears, when seen through a telescope, like a globe of fire, in a state of violent commotion or ebullition. La Place believed it to be in a state of actual combustion, the spots being immense caverns or eraters, caused by eruptions or explosions of elastic fluids in the interior.

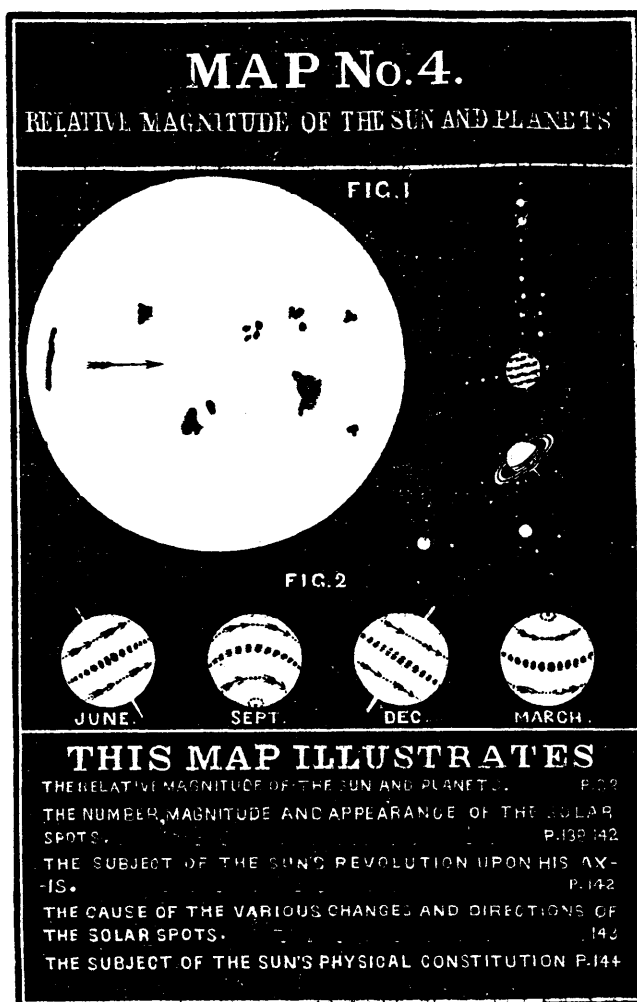
The most probable opinion is, that the body of the sun is opaque, like one of the planets; that it is surrounded by an atmosphere of considerable depth; and that the light is sent off from a luminous stratum of clouds, floating above or outside the atmosphere. This theory accords best with his density, and with the phenomena of the solar spots.

Of the *temperature* of the sun's surface, Dr. Herschel thinks that it must exceed that produced in furnaces, or even by chemical or galvanic processes. By the law relative to the diffusion of light, he shows that a body at the sun's surface must receive 300,000 times the light and heat of our globe; and adds that a far less quantity of solar light is sufficient, when collected in the focus of a burning-glass, to dissipate gold and platina into vapor.

The same writer observes that the most vivid flames disappear, and the most intensely ignited solids appear only as black spots on the disc of the sun, when held between him and the eye. From this circumstance he infers that however dark the body of the sun may appear, when seen through its spots, it *may*, nevertheless, be in a state of most intense ignition. It does not, however, follow of necessity that it *must* be so. The contrary is at least physically possible. A *perfectly reflective* canopy would effectually defend it from the radiation of the luminous regions above its atmosphere, and no heat would be conducted downward through a gaseous medium increasing rapidly in density.

The great mystery, however, is to conceive how so enormous a conflagration (if such it be) can be kept up from age to age. Every discovery in chemical science here leaves us completely at a loss, or rather seems to remove farther from us the prospect of explanation.

If conjecture might be hazarded, we should look rather to the known possibility of an indefinite generation of heat by friction, or to its excitement by the electric discharge, than to any actual combustion of preponderable fluid, whether solid or gaseous, for the origin of the solar radiation.*



The relative magnitude of the Sun and Planets is represented in Map. 4, Fig. 1. The scale of the charts is the same as in No. 2—namely, 40,000 miles of diameter to an inch. As the sun is 886,000 miles in diameter, he is drawn $2\frac{1}{2}$ inches across, to show his true magnitude as compared with the planets. These may be seen on the right side of the map, commencing with Mercury at the top, and passing downward to Herschel. Neptune is opposite to Herschel on the left.

The secondary planets will be seen around their primaries.

The magnitudes of the primary planets as compared with the earth, are as follows, viz.:

Mercury,	$\frac{1}{13}$	Ceres,	$\frac{1}{13}$
Venus,	$\frac{1}{9}$	Pallas,	$\frac{1}{33}$
Earth,	1	Jupiter,	1,400
Mars,	$\frac{1}{4}$	Saturn,	1,000
Vesta,	$\frac{1}{28800}$	Herschel,	90
Astræa, unknown.		Neptune,	90
Juno,	$\frac{1}{13}$		

The sun is 1,400,000 times larger than the earth, and 500 times larger than all the other bodies of the Solar System put together. It would take one hundred and twelve such globes as our earth, if laid side by side, to reach across his vast diameter.

The moon's orbit is two hundred and forty thousand miles from the earth. Now, if the sun was placed where the earth is, he would fill all the orbit of the moon, and extend more than two hundred thousand miles beyond it on every side! What is a globe like ours compared with such a vast and ponderous body as the sun?

* Herschel's Treatise on Astronomy.