other bodies. I will just set fire to the point of this little bit of wood, and then plunge it into the jar of oxygen, and you will see what this gas does in increasing the brilliancy of the combustion. It does not burn, it does not take fire as the hydrogen would, but how vividly the combustion of the match goes on. Again, if I were to take this wax taper and light it, and turn it upside down in the air, it would, in all probability put itself out, owing to the wax running down into the wick [the

Fig. 6.

Lecturer here turned the lighted taper upside down, when in a few seconds it went out]. Now that will not happen in oxygen gas; you will see how differently it acts (Fig. 6) [the taper was again lighted, turned upside down, and then introduced into a jar of oxygen]. Look at that! see how the very wax itself burns, and falls down in a dazzling stream of fire, so powerfully does the oxygen support combustion. Again, here is another experiment which will serve to illustrate the force, if I may so call it, of oxygen. I have here a circular flame of spirit of wine, and with it I am about to show you the way in which iron burns, because it will serve very well as a comparison between the effect produced by air and oxygen. If I take this ring flame, I can shake, by means of a sieve, the fine particles of iron filings through it, and you will see the way in which they burn [the Lecturer here shook through the flame some iron filings, which took fire and fell through with beautiful scintillations]. But if I now hold the flame over a jar of oxygen [the experiment was repeated over a jar of oxygen, when the combustion of the filings as they fell into the oxygen became almost insupportably brilliant], you see how wonderfully different the effect is in the jar, because there we have oxygen instead of common air.

(To be Continued.)

*On the Influence of White Light, of the different Colored Rays, and of Darkness, on the Development, Growth, and Nutrition of Animals.** By HORACE DOBELL, M. D., &c.

The apparatus used in the following experiments was described in my Paper; but in the present instance, only two of the cells were employed, viz: that exposed to ordinary white light, and that from which all light is excluded. In order more effectually to prevent the possible admission of light, the following precautions were adopted with the dark cell:—1. The perforated zinc floor was covered with thick brown paper. 2. The under surface of the lid was lined with black cloth, to secure accurate adjustment when shut. 3. The opaque black glass was covered with an additional coat of black oil-paint. 4. The lid was never opened in any light except that of a candle or of gas.

March 20th, 1859.—A number of ova of the silk-worm (*Bombyx mori*), all of the same age, were placed in each of the two cells. No

* From the Lond. Ed. and Dub. Phil. Mag., June, 1860.

change was observed until *May 18th* (sixty days after the commencement of the experiments), when one larvæ emerged from the ovum in each cell; and during twelve days, larvæ continued to emerge in the light and in the dark at the same rate.

June 9th.—Sixteen larvæ, as nearly as possible of the same size, were selected in each cell, and the rest removed. The experiments then proceeded with these thirty-two individuals, and no death occurred from first to last.

The following Table shows the day on which each larva began to spin; the day on which the perfect insect escaped from the pupa; and hence the number of days occupied by the metamorphosis.

LIGHT.			DARKNESS.		
Day of beginning to spin.	Day of escape of the Moth.	Number of days occupied by metamorphosis.	Day of beginning to spin.	Day of escape of the Moth.	Number of days occupied by metamorphosis.
July 1	July 18	18 days inclusive	June 30	July 18	19 days inclusive.
" 2	" 19	18 " "	" 30	" 18	19 " "
" 2	" 19	18 " "	" 30	" 18	19 " "
" 2	" 18	17 " "	" 30	" 18	19 " "
" 2	" 18	17 " "	" 30	" 21	22 " "
" 2	" 19	18 " "	July 1	" 18	18 " "
" 2	" 19	18 " "	" 1	" 18	18 " "
" 3	" 19	17 " "	" 2	" 18	17 " "
" 3	" 21	19 " "	" 2	" 19	18 " "
" 4	" 20	17 " "	" 2	" 20	19 " "
" 4	" 20	17 " "	" 2	" 19	18 " "
" 4	" 20	17 " "	" 2	" 20	19 " "
" 4	" 21	18 " "	" 2	" 21	20 " "
" 4	" 21	18 " "	" 3	" 21	19 " "
" 5	" 21	17 " "	" 3	" 20	18 " "
" 6	" 24	19 " "	" 4	" 21	18 " "

From this it is seen that the mean period occupied by the metamorphosis in the *darkened cell* was eighteen days fifteen hours, and in the *light cell* seventeen days sixteen hours.

The longest and shortest periods in the *darkened cell*, twenty-two days and seventeen days, in the *light cell*, nineteen days and seventeen days.

June 9th.—On selection of sixteen of the largest larvæ from the inhabitants of each cell, it was noted that, when sixteen were selected from the *darkened cell* and several of *similar size* removed, only four could be found as large in the *white cell*; the remaining twelve selected were therefore of a rather smaller size. This difference in the two cells became less obvious afterwards, but, throughout the experiments, there was a slight difference of size in favor of the darkened cell.

With these exceptions, no difference could be detected between the results obtained in the cell from which light was completely excluded and in that exposed to its full influence.

The larvæ, the silk produced, and the moths from the two cells, when placed side by side, could not be distinguished from one another.

The ova were of the same color when first deposited, and under-

went the same changes of appearance, at the same time, in the dark and in the light.

So far, therefore, as the direct agency of light is concerned in the development, growth, nutrition, and coloration of animals, the results of these experiments closely correspond with those already recorded in my Paper.—*Phil. Mag.* s. 4. vol. xviii, p. 143.

For the Journal of the Franklin Institute.

Observations on the Eclipse of July 17th, 1860.

The following observations of the eclipse of the sun, July 17, 1860, were made at Germantown, Penna. Lat. of observatory, $40^{\circ} 1' 39''$, Long. $5^{\circ} 0' 41.9''$.

The instrument used was a good refractor, and the time is that shown by an astronomical clock regulated by a transit instrument.

The morning was clear, and in every respect favorable to observation.

Time of first contact,	19 ^h 5 ^m 00 ^s	Thermom. in sun,	96°
Greatest obscuration,	20 4 18.5	“ “	89
End of eclipse,	21 3 37	“ “	106.5

The mean height of the thermometer in the sun during the eclipse, was 101.25° , which point, it is fair to suppose, it would have reached at 20 h. 4 m. 18.5 s. under ordinary circumstances, and therefore that a modification of temperature of 12.25° was produced by the interception of the sun's rays at the middle of the eclipse.

The figure, which is taken from a drawing of the image thrown upon the ground glass of a camera obscura at the time of greatest obscuration, shows five digits eclipsed.

N. B. It may not be amiss in this connexion to make some allusion to the very extraordinary atmospheric phenomenon of Friday evening, the 20th inst.

About $9\frac{1}{2}$ o'clock, P. M., a luminous body nearly the size of the full moon when setting, appeared in the western heavens, at an elevation of about 25° , shedding a brilliant light upon all terrestrial objects. It moved with moderate velocity in a north-easterly direction, preserving its parallelism with the horizon almost throughout its course, upon reaching the centre of which it divided, without any perceptible report however, into several lesser bodies, following each other at short intervals, gradually diminishing and leaving sparks in their train, until lost in the east in one single bright star, about the diameter of the planet Mars, as it now appears.

It is not a little remarkable that, notwithstanding the large number of persons who witnessed this phenomenon, singular coincidence prevailed in their impressions with regard to its magnitude, velocity, duration, &c.: thus contradicting the common assertion that no two men see the same thing alike.

W.