

as Woodberry is looked upon in that city as an earnest of what might be done on a larger scale for the city's growth and prosperity by increasing the number of its manufacturing establishments. If, as the *Sun* remarks, the hearty cooperation of every citizen will be given to whatever effort may be made to increase the manufactures of Baltimore, there can be no doubt that intending manufacturers will take the advantages offered into careful consideration

INDEPENDENT WORKERS.

As the larger industries from the pressure of the times become crippled or paralyzed, it is surprising to note how quickly our American inventors devise machines and appliances for doing in a small way what was before done on a large scale, in factories controlled by capital and employing heavy machinery and a great number of men.

When capitalists fear to invest and the whole manufacturing world is in a state of suspense, the self reliance of the mechanic or artisan is brought to the test. Then each must begin an industry for himself, choosing the particular branch of manufacture with which he is best acquainted.

In these days, for almost every branch of industry, tools and machinery that can be operated single handed are obtainable. With such tools and machinery, and with a reasonable amount of energy, skill, and good judgment, it would rarely happen that a man could not at least earn a livelihood, with the probability of doing much better, and with the satisfaction of being his own master

A thousand energetic men with a thousand light machines would, in many branches of manufacture, prove formidable competitors for a large establishment, employing the same number of men, and especially in the present state of affairs is it evident that the small manufacturers have the advantage over the larger, who now struggle against interest on investments, and are obliged to conduct their business on an unprofitable scale; if at all.

Now, when mechanics and artisans are looking for the dawn of better times, and hoping for the revival of industries, is the time for every workman to become capitalist, president, vice president, secretary, and superintendent. Instead of "waiting for something to turn up" let every workman apply himself to business. We would then have a multiplicity of industries which would increase in importance as the times grow better, and furnish employment while the times are unpropitious.

A CURIOUS INSECT.

Practical entomologists will find a very interesting and suggestive study of a singular phase of insect life in Mr. William H. Gibson's paper on the "House Builder Caterpillar," printed in the current issue of the *SCIENTIFIC AMERICAN SUPPLEMENT*. Mr. Gibson says that for a dozen successive years he has studied this insect, collecting hundreds of caterpillars and cocoons and watching their transformations. Meantime he has searched in vain for any satisfactory account of the singular features of the reproduction of the insect and the fertilization of the eggs. Harris says that the female never leaves her cocoon. Packard says the same. Gibson says there is no female!

Mr. Wood says of a West India species that the female has no external vestige of wings, and looks more like a grub than a moth, the head, thorax, and abdomen being hardly distinguishable from each other, and adds: "Love and courtship with this insect are carried on quite in an oriental fashion pushed to extremes; for whereas the oriental in many cases never sees the face of his veiled bride until after the nuptial ceremony is completed, the house builder moth never sees his mate either before or after marriage, and so is obliged to love blindly or not at all."

Mr. Packard's account is characterized as "more specific but nevertheless unsatisfactory." He describes the female as wingless, cylindrical, and in general form closely resembling its larva. The fertilization of the female he believes to take place while it is within the case, which it never leaves, and in which the eggs are deposited. This conclusion Mr. Gibson thinks to be based entirely on inference, not at all on observation

According to Mr. Gibson's observations the female larva is transformed, not into a moth, but into a bundle of eggs and a little fuzz, which, under the microscope, reveals forms of wing scales similar to those on ordinary moths. If fecundation takes place at all it occurs either during the caterpillar state, which is improbable, or the fecundative is passed down several generations after the manner of the Aphides. Mr. Gibson illustrates by numerous drawings the various stages in the development of this strange insect, as observed by him. The caterpillar inhabits the arbor-vitæ, larch, hemlock, and the like, sometimes doing much harm to these favorite hedge and shade trees.

NINE ounces—a little more than half a pint—of water may be decomposed into eight ounces of hydrogen gas and one ounce of oxygen gas.

PHOTOGRAPHIC AND OTHER VIEWS OF THE ECLIPSE.

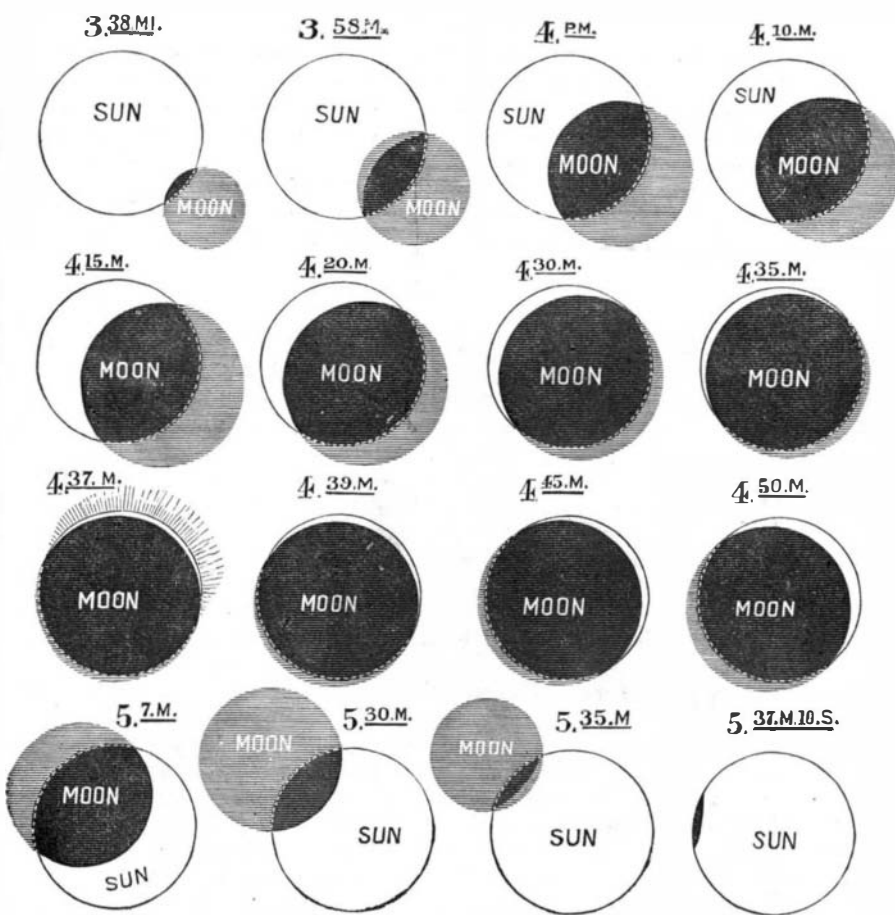
We are indebted to several amateur and professional astronomers for interesting reports of their observations, but have room for only the following:

Fig. 1, a copy of a photograph taken at Indianapolis, Ind.,



by Mr. F. M. Lacey, we owe to the courtesy of Mr. L. T. Stanley of that city. It shows the eclipse as it appeared there at 4h. 51m. P. M. The cloud effects as shown in the photograph are very fine.

Fig. 2 represents a series of diagrams sent by J. B. Jones, M. D., representing the several phases of the eclipse indicated, as observed through an ordinary field glass at Caddo C. H., Indian Territory. The time is that of Sedalia, Mo. From 4:15 to 4:35, the sun was partially obscured by the moon.



In these diagrams the observer has evidently given precisely what he thought he saw; but it is equally evident that he did not see what he represents. We reproduce his drawings as an illustration of the liability of unpracticed observers to misinterpret the testimony of their senses. Of course the observer did not see the full orb of the moon at any time, save at the moment of totality. He saw at each other instant a lenticular spot of black creeping over the face of the sun, increasing in size up to the moment of to-

totality, then regularly diminishing to the end of the eclipse. In his diagrams, however, he has completed the circle of the moon for each phase of the eclipse from the portion visible, and, misjudging the impinging curve, has drawn the curious series of expanding and diminishing moons shown in the cut.

The moral of it all is the uncertainty of individual observation, however sincere, particularly when the observer is not an expert. Had the phenomenon been one of local or unique occurrence, visible to no other observer, such a misreading of facts might have given rise to endless theorizing to account for the real or apparent increase and diminution of the moon's orb before and after totality. Indeed, in earlier times the hottest of controversies have arisen from just such mistakes.

THE ECLIPSE.—A NOTE FROM PROFESSOR MITCHELL.

[The following pleasant note from the head of the Vassar College Eclipse Expedition touches some points not noticed in the press reports.—ED. SCI. AM.]

DENVER, July 29, 1878.

The weather has been all that any one could desire, and the eclipse has been successfully observed.

The brilliancy of the corona far exceeded that of the eclipse of 1869 as observed at Burlington, Iowa, but the rosy prominences were less marked. We obtained a sketch of the corona in oil during the 2m. 40s. of totality.

Mercury, Regulus, and Mars were seen, Venus was very brilliant, Procyon and several other stars were visible. Situated as we were on a lofty plain outside of the city of Denver, the landscape (including, as it does, a long sweep of the Rocky Mountains) was wonderfully beautiful. The sweep of the black shadow was seen as it approached us from the Rocky Mountains, and its retreating darkness was seen to cross the plain to the southeast.

I have been assisted in the day's work by four of the graduates of Vassar, and every facility has been afforded us by the citizens of Denver. MARIA MITCHELL.

THE STUDY OF REAL LIFE IN SCHOOLS.

Referring to the growing custom of using newspapers in the place of reading books in schools, a teacher in the Milwaukee High School, Professor L. Burstall, writes us that for some years he has used the *SCIENTIFIC AMERICAN* in that way with the most beneficial results. His belief is that a great part of the work of schools, especially of the higher grades of schools, should be to direct the work of students to "real results," to knowledge "that may give them a lift in future years," and fit them to understand that they "ought to be greater, more practical, more decisive than their fathers." For this reason he thinks that too much time is given in the schools to the history of the past, to human conflicts and dynastic struggles, battles, mad strifes, and the victories of hypocrisy and brute force; and too little time to the history of real progress of the present age, the history of the steam engine, the telegraph, and other inventions, the influence of which would be to impel the students to emulate in their lives the men who have lived and labored for the real benefit of humanity.

As the best exponent that he knows of the realism which is the mainspring of our country's success is the *SCIENTIFIC AMERICAN*, he insists that it ought not only to be on file in all school libraries, but that it should be used as a common reader, for translation and for composition, as a leader for class work and home occupation.

We are not sure but our friend is altogether right. Certainly one great fault with current school teaching is that it gives too little attention to, and is too little in sympathy with, the real working and determining forces of the age. As our correspondent puts it, "too much time is given to the knowledge of the past, very little to the present and the future." As a natural consequence, most students leave school not much better fitted for the life of to-day than they would be had they been schooled a hundred years ago and laid away to sleep for a century. The reading of a paper like the *SCIENTIFIC AMERICAN* in school or at home must do much to correct and atone for this neglect of the scientific conditions and aspects of modern life in the routine work of the schools. While much of the information given is beyond the years of school children, enough of every-day life is covered from week to week, pictorially or otherwise, to make the paper instructive even to the youngest.

One Effect of the Chinese Famine.

The great famine in China has created a sudden and large demand for the cereals of the Pacific slope, and the farmers of that region prosper accordingly. All the steamers from San Francisco now go out fully loaded with flour. Unfortunately many California farmers were deterred from seeding largely by the drought of last year, and the wheat crop of the State is light; but the crop of Oregon is fair in quantity and quality. Already the people of this coast are beginning to feel the revival of trade, and the season promises to be a decidedly favorable one.