

ternate generations." This discovery deservedly stamps the clever author of the shadowless man, as one of the few, in whom rare powers of observation have been cultivated simultaneously with the graces of fancy.

The believers in the possibility of Heterogenesis, who contend that the diversities of succeeding generations may go on indefinitely without any necessary recurrence to an ancestral type, have not been slow to argue that these changes seen in the *Amæba* and in many of the Infusoria, tend to confirm their views. Carefully prepared drawings were given in the Journal of the Royal Microscopical Society, about a year ago, of transformations of a *pin point monad*, which had been seen by an English observer of some note. This monad which under the highest powers is a mere speck, he had seen gradually become an *Amæba*, and pass on through two intermediate forms to a fully developed ciliated Infusorian. Prof. Edwards, of New York, has given a detailed account of similar changes, which by watching for two days he had seen in an *Amæba*. Similar observations to these have been published during the last few years, resulting in much discussion, and the spread of a wider interest in every thing pertaining to the development of infusorial life. Those best competent to judge, are however, found with those who are most strongly protesting against drawing from imperfect observations, conclusions which the most extended knowledge of animal life can support by no analogy. Perhaps nothing having life is known, the sight of which more strongly tends to excite curiosity in an observer than an *Amæba*. There was an early member of the Royal Society, whom Butler the poet was not slow to satirize, who believed that the special organs of one sense might be made to do the duty of another, and who instanced in support of his views, a Spaniard who "heard with his eyes and could see words." Our *Amæba*, though far smaller, is more than a match for Sir Kenelm Digby's Spaniard, for it discharges the duties of many organs in blissful ignorance of organs altogether. As to special provisions for discharging the functions of life, it is actually "sans everything." Yet it moves without muscles, tears and nourishes itself without mouth, stomach, or any special arrangements for absorption and assimilation, in short, performs all its vital actions with an independence of special structural provisions, to which no other living being, high or low, can make any pretensions. A mere tiny lump of jelly, nothing can be imagined to live, with less differentiation of parts.

Although the *Amæba* is oftener met with in gatherings from our Bay than any other *Rhizopod*, we may sometimes find some of its near relations. One of these, the Sun Animalcule, *Actinophrys Sol*, is remarkable for

being surrounded by fine radiating pseudopodia, which make it the miniature resemblance of these rayed figures used from time immemorial to represent the sun.

Another form, a species of *Arceuthobium*, sometimes to be seen amongst the duckweed, closely resembles in structure the *Amæba*, but has the addition of a tiny, delicate shell.

The *Rhizopoda*, the class to which these organisms so remarkable for their simplicity of structure, belong, have existing representative forms scattered all over the world. Their fossils, too, shew they had an existence in ages of the world so remote, that there is nothing which now lives, and nothing which to our present knowledge ever has lived, but must yield to their claims to be regarded as the earth's earliest settlers. Some groups kindred to these furnished by our gathering, deserve, from their importance as prominent members of this class, a few words of our gossip. One of these groups which has taken, and still takes an active part in the changes to which the earth itself is constantly subjected, by its innumerable inhabitants, is called, from the minute pores with which the shells of all the members of the group are perforated, *Foraminifera*. These shells are calcareous, and the substance of the bodies which occupy them has been shewn by DeJardins to be Sarcodæ. This sarcodæ is thrown into fine pseudopodia, similar to these found on our sun animalcule, and which are protruded like treads through the minute pores of the shells. Soundings in the deeper parts of the Gulf of the St. Lawrence, and in the Atlantic show their presence in the ooze in vast numbers and many varieties. Soundings for the Atlantic cable showed the ooze in places to contain ninety five per cent of one species, the *Globigerina*. So numerous are they in some places that a single ounce of sand from the Antilles has been estimated to contain four millions. In the chalk too their fossils are abundant, and they were undoubtedly active agents during the period of its deposition. Some of their species are almost cosmopolitan, and are found in the marls and calcareous rocks of the Tertiary, wherever these rocks have been defined. Charleston, South Carolina, stands on a deposit of marl more than 200 feet thick, in which, according to Bailey, *Foraminifera* are entombed in myriads. The stone commonly used in Paris for building, and that of which the Egyptian Pyramids are built, have *Foraminiferous* fossils for their chief ingredients. These insignificant forms of life are thus alike associated with man's most recent and artistic, and with his oldest, and most durable work.

The members of another group of this class, the *Polycystina*, have minute siliceous shells, which for beauty, the Diatoms themselves cannot surpass. The substance of the bodies of this group is similar to that of the *Foraminifera*, and as in them the pseudopodia