or mechanical. The material theory of heat supposes it to be a kind of matter—caloric—a subtle fluid, stored up in the interatomic spaces of bodies. The dynamical theory discards the idea of materiality as applied to heat. The supporters of this theory do not believe heat to be matter, but an accident or condition of matter—a motion of its ultimate particles. Whether heat is matter or a property of matter, there is no conception of heat or cold, hard or soft, sound or silence, dark or light, life or death; apart from matter all are conditions, and have no existence independently of matter. Faraday proves in his lectures on the chemistry of a candle, that when a candle burns the substance of the candle is not lost or destroyed, but has simply become insensible to our powers of vision. That these various forms of energy are mutually convertible; that we can express any one of them in the terms of any other, and therefore that a certain quantity of one form is equivalent to, or may be made to produce, a given quantity of another form. This new philosophy, as Tyndall calls it, declares that heat has no existence independently of matter; that what we call heat is only a peculiar condition of matter, viz., a vibration of its ultimate particles, so that as heat is nothing but motion, we can measure heat as we measure common mechanical energy by a weight falling through a given space. It further shows us, by virtue of convertibility and owing to the possibility of expressing each of these in terms of common mechanics, that the destruction or creation of *energy* in the world is just as impossible as the creation or destruction of matter itself. Helmoltz, Meyer, and other philosophers have speculated on what Herschell calls the grand secret of the power supporting the constant light and heat which the sun continually pours upon the universe. It is admitted that it cannot be kept up by ordinary combustion. Herschell says: "It would be burnt out in 4,000 years, yet geology teaches that the sun has shone on our earth as it does now for hundreds of thousands years."

In one of his lectures Tyndall give speculations of philosophers which show that if a meteoric or asteroid were to fall into the sun with the greatest velocity which it is capable of acquiring, it would, in falling, engender a quantity of heat 10,000 times as great as that which would be developed by the combustion of an equal weight of coal. This makes motion superior as an heat-giving power to any combustible we have knowledge of. These meteorites are known to fall on the earth in certain seasons in large numbers. During an observation in Boston of nine hours 240,000 meteors were observed. The number falling on this earth in a year may be estimated at hundreds or thousands of millions, and these would only be a small portion which circulate round the sun. Astronomers seem to think it probable that the lens-shaped mass, termed by us the zodiacal light, which surrounds the sun consists of a vast collection of such asteroids. These moving, like the planets, in a resisting medium, must approach the sun, and on showering down on the sun's surface transfer their motion into heat, thus maintaining the temperature of the sun, and therefore sustaining life on our planet, for "each drop of rain or flake of snow, each mountain streamlet or brimming river, owes its existence to the sun." It is by the power of the sun's rays that the waters of the ocean are lifted in the form of vapor into the air, and it is by condensation of this atmospheric moisture that every drop of running water on the earth's surface is formed.

Nor is this influence of solar radiation confined to the inorganic world; no plant can grow, and therefore no animal can exist without the vivifying action of the sunbeam. The animal derives the store of energy necessary for the maintainance of life from the force locked up in the vegetable or animal organism upon which it feeds; the food of the animal undergoes combustion or oxidation in the body, and the heat thereby evolved is converted into mechanical energy, so that the labor of the animal is subject to the same laws which regulate the work done by the steam engine, supplied with vegetable fuel. We see that the animal draws its store of energy from the plant. Where does the plant obtain the supply of energy necessary for its growth? The animal cannot continually gain power from the vegetable unless the latter has as continual a supply. The source of power in the plant is found in the sun's rays. It is the sun's rays alone which enable the plant to grow, for the growth of a plant consists chemically of a decomposition or splitting up of the carbonic acid gas which exists in the air into its simple constituents—the carbon assimilated for building up the vegetable tissues and the oxygen being sent back into the atmosphere for the subsequent use of animals. To effect this separation of the particles of carbon and oxygen a very large expenditure of energy is necessary, and this energy is supplied by the sun. The rapidly vibrating solar rays are absorbed by the plant, and their energy used in tearing the particles of carbon and oxygen asunder.

Thus we trace trace the globe which we inhabit to vapor, from vapor to liquid, from liquid to an incandescent state, which geology indicates in the leaves of the earth's crust. This unmistakably points to a beginning of the earth's existence. How did all this arise? Here explanation is set at defiance; but it is where explanation seems set at defiance that the true student of nature is most hopeful of finding instruction. "Truth," says Faraday, "should be the primary object of the philosopher." The theist believes in a self-existant God, of whom he knows nothing. The Atheist in the eternity of matter, of which he knows a little. But, asks the theist, does materialism explain the origin of existence? No; nothing explains the origin of existence. Some kind of existence is eternal, therefore something is without an origin. All speculative thinkers agree that something exists which never had a commencement. No one believes that in the beginningless past there was an absolute emptiness. Ingersoll says that "*nothing* as raw material for creating a world is a failure." Though the word *eternity* has an indefinite meaning, we are forced to accept something as ever-existent. Where nothing is certain all is conjecture.

If the indestructibility of matter establishes the eternity of matter, and the various forms of energy are mutually convertible, if heat is noting but motion, and if we can measure heat by common mechanical energy, if matter and motion explains all terrestrial actions, all life, all nature; if, as Tyndall says, "the solar ray forms the muscle and builds the brain," and the sun's heat is kept up by the showering down of asteroids and planets on the sun's surface, their motion being transferred into heat, the secrets of life are exhausted and mental as well as physical action are referable to a material standard. Experiment has established that the smallest degree of motion produces heat, which intensifies as the velocity increases. This powerful agency of motion *may be* sufficient to account for all the heat which is distributed through the universe. Proctor says, in his lectures on the growth of worlds, "When the sun gathers in matter from without, the velocity of the matter increases as it approaches the sun, calculated by all mathematicians the velocity would be infinite at the sun's surface." Matter being eternal and motion continuous, matter and motion would include all phenomena, and when an apparent destruction of matter takes place, matter is *not* destroyed. Recomposition commences, and evolution proceeds in an endless cycle of changes.

Many things having souls, have, in some instances, very small souls.—*W. S. Bell.*

The doctrines of the infidels rest not upon faith (which is only imagination), but upon real facts and demonstrated science—the only foundation that keeps any one upon "the safe side" and renders them guiltless of deceiving and hoodwinking their fellows, and perpetuating error, fable and mythology all down the coming ages, stultifying and dwarfing the intellect, and sowing the seeds of sadness, gloom, and misery, instead of those of hope, health, happiness, and knowledge. The Christian promises what he cannot give, what is not in existence nor can possibly exist. The Infidel promises the real and the tangible: the blessings of this world in all its fullness of joy and possibilities—Nature's free gifts to her children. Reader, which will you have?—*Mrs. E. D. Slenker.*