

logical studies, have, as a main argument, insisted on the greater utility of the knowledge of scientific truths as compared with the knowledge of the ancient Greek and Roman authors, so liberally imparted to our college-going youth. They have pointed out the glorious results with which science has enriched human society in the nineteenth century, and the comparative sterility of the so-called classical studies; they have pointed out the success in practical life of those men who have received a scientific education, while those whose whole training was merely philological have, in many cases, been starving for want of capacity to earn an honest living by useful practical labour, either mental or mechanical. In short, they have confined themselves to the task of praising science from a mere utilitarian point of view, forgetting that it may have higher claims, not only equal to those on which the friends of the old and time honoured custom of studying the classics base their defence, but even surpassing which may be asserted in favour of the effect of studies of the dead languages and literature on the development of the human mind.

The higher classes of society, especially in England, consider labour, if not directly degrading, at least below their special domain. They are apt to regard that kind of knowledge which is merely useful and such as men in practical business are in need of as without interest; and in place of attempting to acquire, for instance, so much knowledge of light and electricity as to be able to understand some optical apparatus or the electric telegraph, they prefer to concentrate their attention upon the writings of Virgil or the poems of Homer. A knowledge of Latin and Greek is supposed to be about the highest enjoyment reserved for a man of high culture, for the reason that these studies are pursued, not for a secondary, base, utilitarian purpose, but out of pure love for what is beautiful and true.

Those lovers of science who feel and know that in the study of God's handiwork, Nature, there is much more enjoyment, beauty and truth than in the study of literature, which is a mere human production, have therefore recently been raising their voices so as to persuade the most cultivated classes, if possible, that the pursuit of scientific studies is at least as much worth their notice as the pursuit of philology; that they should not abhor a chemical laboratory, or philosophical cabinet, as dull and dry; that there are fascinations hidden in these sacred precincts of science, which have only to be tested, with the purpose of impartial investigation, in order to be appreciated. This order of defenders of science have found a powerful advocate in Professor Tyndall, who, in his recent lectures, so often insisted that the classes of people for whom he spoke "should take science to their bosoms, not as the servant of Mammon, but as the supporter and enlightener of the mind of man." And the effect of his often repeated appeals has been something marvelous; people of high standing in society, and of corresponding cultivation of mind, who have been accustomed to occupy themselves in their spare hours with reading poetry and works of fiction or, at the very best, the so called classics, have furnished their libraries with works on science, and are studying optics, the polarization of light, etc.; and some have even gone so far as to buy, in place of useless ornaments, prisms, microscopes, and polariscopes, and are delighting themselves and their friends with the revelations made by those instruments, which seem to give us additional organs of sense.—*Scientific American*.

2. WATER AS FUEL.

"On Monday and Tuesday afternoon," says the San Francisco *Alta*, "a large number of citizens, by invitation, visited the brass foundry on Fremont street, for the purpose of witnessing some experiments with a new fuel recently invented. They were shown into that portion of the establishment occupied by the furnaces, and in one corner found a brick furnace, some eight feet long and six feet high. On the top of this was an iron tank holding about ten gallons, which was filled with crude petroleum. From this tank a pipe about an inch and a half in diameter led into the side of the furnace. A small jet of oil, not larger than a small goose-quill, was permitted to flow out of this tube; a light is placed beneath this jet, and it immediately ignites. Another pipe, about an inch in diameter, leads from a steam boiler stationed some fifteen feet away. This pipe leads a small jet of steam upon the burning oil, and the moment the steam strikes the oil the oxygen in the water is set free and ignites with a tremendous roar, generating in a very few moments a most intense white heat."—*Scientific American*.

3. DIFFERENT KINDS OF LIGHTNING.

Lightning is usually classified into *sheet*, *forked* and *ball* lightning. *Sheet* lightning is merely the reflection of forked lightning, or the electric discharge which has occurred somewhere out of the field of view. *Forked*, called also *zig-zag* or *chain lightning*, is the light pro-

duced by the disruptive discharge between cloud and cloud, or between cloud and earth. *Ball* lightning is of a very different character. Many of the so-called "balls" are undoubtedly optical illusions, and Faraday himself stated that they were incompatible with what we know of electric discharge. "There may be balls of fire," said he, "but they are not electrical." Yet the evidence of balls of blue fire, rolling along the surface of the sea and suddenly terminating in terrible electric discharges over ships, masses of fire rolling along the ground toward buildings, ending in fatal discharge, and many other cases, leaving it unquestionable that some such phenomenon as globular or ball lightning exists. Some have explained them to be balls of incandescent gas, rendered so by the discharge. According to others, ball lightning is a luminous spot on the earth, terminating a current or brush discharge from a negatively charged cloud. This spot moves with the cloud. Illuminated lines of force are projected from some point in the cloud upon the earth. The effect has been very successfully repeated experimentally, and this fact is suggested as an explanation of the photographic images imprinted on the skin of persons struck by lightning.—*To-Day*.

VII. Miscellaneous.

1. THE PUBLIC SCHOOL TEACHER.

On the outskirts of the forest,
Twixt the shadow and the sunshine,
Stands the ancient time-worn school house,
Where the children flock together,
Of all ages and all sizes.
In all seasons, through all weather,
Come they here in quest of wisdom;
Come they here day after day,
At the doorway of the school house
Stands the ancient time-worn teacher;
Stands she there to watch the gambols
Of the young rogues sporting near her,
Of the maidens gaily playing
In the sunshine and the shadow,
Little thinking of the future;
Thinking naught but of the present;
Dreaming not that care and sorrow
E'er will dim those eyes so sparkling,
Flashing now in their bright beauty.
Still the ancient teacher stands there,
Watching sunshine and the shadow,
Watching birds so freely winging
Their swift flight o'er wood and valley
In the glad and joyous sunshine;
Over brooklets, over streamlets,
Singing their sweet songs of praises,
Echoed back by hills and forests
In that peaceful "land of plenty,"
Stands she still there in the sunlight,
Stands she there so sadly thinking,
On the past and of the future,
Of the years that have flown o'er her,
Of the years that still must come;
Of the lonely days and weary
She has spent in that old school room—
Days that ne'er will come again,
Whilst the fickle, sportive sunshine,
Gaily playing with her wrinkles,
Idly dancing, flashing, glimmering,
As she stands there pale and pensive,
Thinking of the days when others
Watched her gambols midst the children,
Whilst her eyes had flashed and glistened—
Eyes grown dull by care and weeping—
Flashed in sunlight and in starlight;
While her happy heart was beating
Merry music in her bosom,
And she thinks of days when lovers—
Brave and noble she had thought them—
Lovers came to woo and win her
From her cares in that old school room,
From the children flocking round her,
From the books she pondered over,
From the studies loved so dearly,
Turned she sternly, firmly from them,
Heeded not their sighs and groanings,
Thought not of their pain and anguish
As they moaned in grief most bitter;
Thought she only of her mission
To those dear and cherished children.
Soon they ceased from their despairing,
Walking lonely in the starlight,
Weeping wildly in the moonshine;