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TO OUR FRIENDS.

NOW IS THE TIME TO FORM CLUBS.

On Saturday, January 3d, a new volume of this journal commenced. We appeal to its friends in all sections of the country where mail facilities exist to endeavor to form clubs for the present year. We feel justified in asserting that no other journal in this country furnishes the same amount of useful reading, and especially at the extraordinarily low price at which it is furnished. The present high price of paper has rendered it necessary that we should somewhat increase the subscription price of the SCIENTIFIC AMERICAN, but by availing themselves of our clubbing rates persons may obtain the journal on very reasonable terms even now. We are obliged to pay more than double the price we did one year ago for the same quality of white paper that the SCIENTIFIC AMERICAN is printed on, while the subscription price to clubs is only a fraction more than formerly.

The long winter evening must be relieved of its dullness, and we must keep reading and thinking, and thus be prepared to overcome temporary difficulties and open new channels of wealth and prosperity. Friends, send in your clubs; at least renew your own subscriptions promptly.

ARCHITECTS—LIGHT AND VENTILATION.

The progress of discovery resembles the unrolling of a mighty scroll. Every age has witnessed new triumphs of mind over inanimate matter. Innumerable are the improvements which have been made in mechanism, but no improvements connected with the interests of humanity are of greater importance at present than those which relate to artificial light. The pine torch of the barbarian and the rush-light of an ignorant age have given place to incomparable gas light and beautiful argand lamps for burning the oil obtained from mysterious subterranean caverns. And yet, with all our numerous improvements, much has yet to be achieved before perfection is reached. Indeed, it is a fact that many improvements but serve to reveal imperfections which had previously escaped notice. It is the office of science to point out evils and defects, and to concentrate attention upon securing arrangements for their removal. Thus, upon another page will be found the communication of a correspondent respecting improved modes of lighting and beautifying a church in Albany, which affords us gratifying intelligence respecting a very proper enlargement of the architect's province and duties. In 1858, on page 125, Vol. XIV (old series) of the SCIENTIFIC AMERICAN, we pointed out the want of appliances in churches and other buildings for the removal of the poisonous gases emitted from open gas lights, and said:—"This is a question which deserves the attention of architects and others in regard to the erection of new buildings, all of which can be fitted up with the improvements suggested." Since that period such improvements have been carried out in several new public buildings in this country, and

it is pleasant to know that many architects are now taking a deep interest in such questions. They are generally men of scientific attainments and much intelligence, and it is right that they should embrace within the scope of their profession a far more extended application of science and art than the mere erection and decoration of buildings, chiefly with respect to what has been called "the legitimate principles of architecture." All buildings should be designed and erected with regard to the health and comfort of those who may occupy them temporarily or permanently, and provision should certainly be made in them for the removal of the foul gases arising from gas and other lights. Every person knows that the burning of an open charcoal fire in a room is dangerous to life, because the product of combustion is carbonic acid gas, which is as injurious to the human system, when inhaled by the lungs, as the taking of arsenic into the stomach. Now, as ten gas jets are equal to a moderately-sized fire in a stove for producing carbonic acid, it is not difficult to estimate the injurious effects of burning open gas jets in apartments. We regret that the suggestions referred to have as yet been acted upon in a very few cases, but the good work is begun, and all honor to the architects who have been the pioneers of the improvement.

Not only churches and other public buildings in which gas is burned should be arranged with provision for the removal of the subtle poison arising from burning gas, but dwelling houses also. Indeed, such appliances are more necessary for them than public buildings, such as churches, court rooms, &c., because persons in the former are constantly exposed to carbonic gas during evening hours, whereas in public buildings the exposure is only temporary. The application of such improvements is just as necessary in places where oil is consumed in lamps, as in those where gas is burned. Niches may be made in the walls of buildings to communicate with the atmosphere outside by valve tubes for carrying off the gas, and these recesses may be constructed with reflectors, and so formed as to be suitable for stationary lights and for receiving movable lamps. We trust that such improvements may soon be very generally applied, and thus unfold another cheering record on the scroll of progress.

THE WONDERS OF THE GLOBE.

From the creation of the world down to the present day, a series of organic changes has been constantly developed, which have not only altered in a material degree the outlines of continents and the landmarks of the mariner, but have changed greatly its constituent particles. For instance: the miners have delved in the bowels of the earth and withdrawn from thence thousands of tons of coal, which, in their turn, have been consumed and wasted by fire; their elements being so wholly transmogrified that nothing remains of all their bulk but a heap of dust. Through all these processes a gradual but constant diminution has gone on; the gases eliminated by the combustion of the fuel have been first set free, then ignited and finally resolved, as to their components, into the atmosphere. So also with the metals—precious and base; they, too, have parted with their individuality as earths, and have lost in bulk during the refinement to which they have been subjected. The rough and ragged edges of the ores have been smoothed into close and tenacious surfaces. The loose and striated masses have been knit closely, as to their fibers, until they are one and homogeneous throughout. Here, again, have the atoms comprising a whole parted, each one, with some portion of their identity whilst being transfused into one mass.

Not only do these changes occur in the metals and the minerals of the globe, but they also take place in the vegetable kingdom. The flowers of the field, the grass, the herbage; these wither and shrink before the fervent heat of the sun, and lose in weight and bulk. Nay! even the monarchs of the wood, unto whose roots the settler lays his civilizing ax, these come crashing down through their fellows and make the earth resound with the force of the impact. They also obey the dictates or the impulses of nature—they become green with mold, they rot to their cores, through all their sturdy branches the sap oozes out until they are utterly dead. Weigh the

dead tree and the living one, and tell us which is the more ponderable. Far to the north, among those huge icebergs, the formation of which no human eyes ever beheld, the cliffs that crop out in the polar regions waste slowly and silently away. Dr. Kane has told us that at their bases may be found, when not covered with snow, an impalpable dust; this is the debris of the rocks, cliffs, or whatever the nature of the structure may be. The silence of those regions is, at times, intense, if such an expression may be allowed. Except when the storms rage in their fury—when the grinding of those phantom towers against the loose pancake-ice ceases, when the floating floes circle idly in some eddy—then proceeds during the short northern summer the waste of the world. The tumuli of ice resolve to water; the monuments reared by the hand of the Frost King topple and fall; and, loosened by the genial warmth, streams trickle slowly down the rocks, carrying in their course the granulated particles liberated by the cold. In the dead of night, in the awful silence of those extreme latitudes, great masses of ice, or earth, or rock, loosen themselves and fall with a mighty crash into the sea beneath.

Thus, through all the zones that belt the globe—torrid, temperate and frigid—a continual waste, an incessant abstraction of the vital functions of nature transpires; these operations are both artificial and inevitable. How far do these organic and elementary changes affect the integrity of the sphere? Gases, as we well know, enter into the composition of our food, our bodies, and the very air and water that we breathe and drink. So also the cloud, silver-lined, that stretches its dark shadow over the summer or the winter heaven, surcharged with cooling showers or else with moisture which is changed in the atmosphere into star-like crystals of snow, these also hold in suspension some portion of the ethereal forces of the globe and descend to revivify and fertilize its various functions. The ashes of the coal part with their chemical ingredients, and make the grass green in the field, or drive the marauding worms from the crops of the farmer. The wasted form of the oak or ash is absorbed by nature, tenderly buried as it were, and enters once more into the shafts which tower above its resting place. So it is with all the material forces which have their being and which are rooted in the world. They arise or exist; they shoot from the soil or lie dormant within it; they are garnered, mined or burned; they vanish utterly in their natural forms, and are seen no more. Yet are they not lost. The several parts wanting are, as we have seen, absorbed by other plants completing their growth and ripening to maturity. In place of the coals that are consumed, there are other veins of them slowly gathering their forces for the comfort of millions yet to be. There are mines also accumulating those wonderful accretions which—now sullen and black, it may be covered by the restless sea—shall one day be exhumed and shine upon the brow of beauty. The globe parts with no portion of its matter to its ultimate loss; through all its vast lungs, the millions upon millions of pores in plants, the yawning ghastly craters of volcanoes, the fissures of the ground in various lands, the subtle vapors and essences from the vast laboratory of nature transpire. Yet all of them, as we have seen, are combined in some other form. The motion of the earth is no swifter than usual; in our headlong race around the sun, we come and go with as much regularity as ever; the stars move upon their nightly rounds, the moon appears and disappears, the planets circle in their orbits, and follow out the plan laid down for them by the Creator; and the vast and grand earth revolves rapidly through space, in obedience to the impulse which first gave it motion. Nothing changes to our loss. Man fights his petty battles, he slaughters those who cherished him, and he rises up in his weakness to mock at God and His works; but yet, through all and over all, the majestic operations of nature go forward with a certainty and surety that can only proceed from an origin and power beyond the knowledge of mankind.

A UNITED STATES TUN.—The Treasury Department has decided that the measure of a tun, in making assessments for the internal revenue, shall be two thousand two hundred and forty pounds, in all cases, under the excise law, unless the contrary is specified.