

Scientific American

MUNN & COMPANY, Editors and Proprietors.

PUBLISHED WEEKLY

At No. 37 Park-row (Park Building), New York.

O. D. MUNN, S. H. WALES, A. E. BEACH.

TERMS—Two Dollars per annum.—One Dollar in advance, and the remainder in six months.
Single copies of the paper are on sale at the office of publication, and at all the periodical stores in the United States and Canada.
Sampson Low, Son & Co., the American Booksellers, No. 47 Ludgate Hill, London, England, are the British Agents to receive subscriptions for the SCIENTIFIC AMERICAN.
See Prospectus on last page. No traveling Agents employed.

VOL. IV. NO. 1. . . . [NEW SERIES.] . . . Seventeenth Year.

NEW YORK, SATURDAY, JANUARY 5, 1860.

NOW IS THE TIME!—SEND IN YOUR NAMES, ACCOMPANIED WITH \$2, IMMEDIATELY.

This number commences a new volume, and thus a better opportunity is presented for subscribing to this paper than at any other period during the year. We hope mechanics, inventors, manufacturers, planters and farmers throughout the country, who are not already subscribers, will avail themselves of the present most favorable time to enroll themselves with the band of nearly thirty thousand who are already its patrons. We believe no employer can make his workmen or apprentices a better New Year's gift than by presenting them with a year's subscription to the SCIENTIFIC AMERICAN. The subscriber not only receives sixteen pages of valuable reading matter, illustrated by a number of beautifully executed engravings, every week, but at the end of the year, if he preserves his numbers (which we counsel every subscriber to do), he will have two beautiful volumes of four hundred and sixteen pages each, with an index, which will be worth to him, as a work of reference, many times the cost of subscription.

The SCIENTIFIC AMERICAN is sold by all the principal news-venders in the country. Persons residing in cities or large villages can subscribe at the news-agent's, and receive their papers regularly at the counter of the dealer, instead of by mail, if they prefer it. For terms of subscription, see last page.

THE FUTURE.

We have entered upon a new year; and are looking forward, each with his own hopes and anticipations, into the future, all eager to know the events which are to come forth from its infinite depths. But an impenetrable veil is drawn over them all, with the single exception of the motions of the heavenly bodies. While all other sciences are limited to the study of the past and the present, astronomy alone assumes the high prerogative of foretelling the events of futurity; and the most impressive of all proofs of the power of knowledge is furnished by the precision with which her predictions are fulfilled. The possession of the God-like power of foreknowledge is moving astronomers with the sublime ambition of enlarging the sphere of its action, and they are now engaged with two great problems, the solution of which will reveal the fate of the universe to times more remote than those which have yet been explored by the daring intellect of man.

If it shall be ascertained that there is a resisting medium in which the planets revolve, the prophecy will be as safe as the foretelling of an eclipse; because it follows, by strict necessity, that all the planets will wind spirally inward till they severally crash into the mass of the sun. And, besides the final catastrophe, there is no doubt that many other events in the future history of the solar system may be foreseen.

The other great problem is the motion of the solar system, itself, among the stars. If this motion is in a vast orbit about the common center of gravity of our stellar system, then the questions will arise whether

this orbit is very eccentric, and whether, in one of the foci, there is a collection of suns, as the Pleiades may be. For in this case, as our solar system approached the perihelion, the temperature might be so increased as to destroy all animal life upon the planets, so that the long work of creation would begin anew.

Again occurs the possibility of the motion of our stellar system among its kindred collections of stars. It may be that this is sweeping around some great reservoir of heat, in an eccentric orbit like that of a comet, and that the matter which composes the solar system will be dissipated into the fiery particles from which it was originally formed as this central heat is approached, and again condensed into a sun and planets as it moves towards its aphelion, away from the heat which scattered it.

Geology teaches us that, compared with the lower forms of animals that earliest inhabited the earth, the human race has been in existence but a very brief period; and when we compare the physical, mental and moral state of the Asiatics, the Africans, and of large numbers of Europeans and Americans, with that of Carlisle, Faraday or Agassiz—the actual condition with the proved possibilities of human nature—we are, on this ground, impelled to believe that our race is in its infancy. Have we not, in the history of the past, good grounds to hope that the ignorance, intemperance, licentiousness, superstition, oppression, vice, crime, war and degradation which prevail in the world, will be gradually removed, and that the time will come when every individual will grow up to the full measure of nobleness and worth of which our nature is capable?

It may be that, when the human species has received its full development, it will be swept away like the extinct species that have preceded it; and as this is the last step in bringing the animal life of the globe to perfection, it may be that all will perish together; perhaps in that final catastrophe "when the elements shall melt with fervent heat," the matter of the solar system shall be scattered into a fiery cloud like that from which it was originally formed. This matter may then again be drawn together into suns and planets, a new earth like our own may be formed, again to be inhabited by animals rising from the monad, through long gradations, up to man; the human race may again be developed from the savage state to the highest form of civilization, again to overcome the evils of ignorance, superstition and intemperance, again to invent the steam engine, the microscope, the telescope and the electric telegraph, again to unroll the records of the past, and again to speculate on the possibilities of the future. And thus the universe may move through successive cycles of perpetual change forever.

FOOD AND GAS REFORMS.

England has advanced with rapid strides in education, rational freedom and wise legislation since the Reform Bill was passed twenty-eight years ago. This is very gratifying to all who labor for social and educational progress. During the last session of Parliament, two bills were enacted which, in an especial manner, affect the welfare of the people, and we look upon them with decided approbation. The one relates to the adulteration of food and drink, and the other to the sale of gas by companies. It has been enacted that any person selling any article of food or drink which, to the knowledge of the seller, contains any mixture injurious to the health of the consumer—also, any person who sells for pure an article of food or drink that is adulterated, shall, on conviction before two justices, forfeit a sum not exceeding five pounds, together with the costs of the prosecution, and on a second conviction, the justices may order the particulars of the offense to be published. Power is given to local boards to appoint competent chemists, subject to the approval of the Secretary of State, to examine articles of food offered for sale, alleged to be adulterated, and report thereon, but opportunity must be given to the seller of such articles to accompany the purchaser to the analyst to secure the article from being tampered with. The purchaser of any article of food or drink can also, upon the payment of a small fee, have the article analyzed by the appointed chemist. Ample provisions are thus made to secure justice to both purchaser and seller. This law is certainly susceptible of wider application and might be copied for New York and others of our own cities with immense

advantage to the community. It is calculated to deter unscrupulous dealers in alimentary substances from adulterating their articles for the purposes of unlawful gain. Provision is also made for cases of appeal, if objections are taken to the analysis of the chemist. This is positively necessary, as it requires not only great chemical knowledge but a very clear judgment to be an exact and sound analyst.

The law relating to gas refers only to London, but it is applicable as a guide to other cities. The act determines the quality of the common gas to be supplied, limits its cost, and provides for a sufficient supply. Its illuminating power must be equal to six sperm candles at six to the pound. The gas made from cannel coal is to be equal in illuminating power to twenty sperm candles. It is to be so pure that it will not discolor turmeric test paper or darken paper imbued with acetate or carbonate of lead during one minute's exposure to a current issuing at a pressure of five-tenths of an inch of water. The gas company which fails to comply with these conditions is liable to a fine of fifty pounds. The local boards have the power to appoint competent examiners, who, for a small fee, will inspect and report to any consumer on the power and intensity of the gas supplied to him. The cost of gas made from bituminous coal is fixed at 4s.6d. per 1,000 cubic feet—that of cannel coal gas at 7s.6d.

This bill is judicious and scientific in its features. There is a very great difference between the quality of gases made from different kinds of coal, whereas most persons suppose that all coal gas is alike. The gas made from common Liverpool coal possesses but little more than half the illuminating power of that obtained from cannel coal. In London its price is about sixty per cent less than the gas sold in New York.

No corporation or company has any right to establish an injurious custom or practice. It is the duty of the legislative authorities to protect the public from such practices, no matter whether it be in the sale of food, drinks, gas, or any other thing. Newton's *London Journal* contains a most able article commending the two reform acts we have described. It justly asserts that while laws had been made previously for the punishment of frauds committed by trustees, bankers, and other persons entrusted with property, it was remarkable that until now no adequate provision had been made to prevent adulteration in the important articles of food and drink, on the quality of which our very lives depend. Well, it is wonderful, but when we know that the telescope was invented before the microscope, we may justly attribute the course of legislation to the same causes.

Our New Year's Dress.

Some persons make great pretensions to having arrived at a delectable state of mind in which they remain as unmoved in an old as a new coat. We confess to a complete scepticism in the sincerity of all such individuals. We never yet knew a sensible fellow who did not feel a sort of *all-overish*, good-natured opinion of himself, his tailor, and the rest of mankind, when he donned a well-fitting new coat. "It's human nature" to feel so, as old David Crocket would have said. We look upon the old Diogenesians and stoics, about whom philosophers have boasted so much, as a set of fossilized curmudgeons, only fit to be stowed away in Dr. Hitchcock's geological cabinet with the teeth of the great *Equus Americanus* and the footprints of the *Ornithomites*. The SCIENTIFIC AMERICAN, in its own personality, feels an inward warmth of conscious regard, sufficient to defy the most chilling blue-nosed nor'wester, at being enabled to make his New Year's bow to old patrons and new friends in "a sprit new dress from top to toe." He considers it the handsomest suit that ever graced his redoubted person; and this anybody can appreciate by a mere side glance, even when running to catch the last train at fifteen seconds and a half behind time. Having discovered the "elixir of life" we intend never to grow old, and our friends, with a full knowledge of this fact, have dressed us up accordingly in the most sprightly and engaging manner, and yet with none of the "gewgaw" and gimp trimmings of the flash style. Our suit is of the best quality, and it is cut in the most harmonious proportions to correspond with our character. With such notions about ourselves, we feel greatly energized in commencing our new volume, and with the best desires for the welfare of our friends, we wish them all "A Happy New Year."