Scientific American.

MUNN & COMPANY, Editors & Proprietors

PUBLISHED WEEKLY AT

NO. 37 PARK ROW (PARK BUILDING), NEW YORK

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

Messrs. Sampson Low, Son & Co., Booksellers, 47 Ludgate Hill n. England are the Agents to receive European subscriptions retisements for the SCIENTIFIC AMERICAN. Orders sent to will be promptly attended to.

VOL. X. NO. 18. [NEW SERIES.]..... Twentieth Year.

NEW YORK, SATURDAY, APRIL 30, 1864.

Contents:

(Illustrations are indicated by an Asterisk.)

*Forest's Machine for Loading
Hay. 273 *Stevenson's Helical Turbine. 280
The Discoveries of 1863. 274 *Supplement to Ure's Diction—
The Chemistry of Gun-cotton. 274 *Supplement to Ure's Diction—
The Chemistry of Gun-cotton. 274 *Supplement to Ure's Diction—
The Chemistry of Gun-cotton. 274 *Supplement to Ure's Diction—
The Constitution of Nature. 275 *Social Condition of Working—
The Constitution of Nature. 275 *Supplement to Ure's Diction—
*Bates's Shaft-shooting Can—
non. 276 *Where the Funds for the War *Bates's Shaft-shooting Can—
non. 276 *Chemical Inventions. 281 *Chemical Inventions. 282 *Chemical Inventions. 282 *Chemical Inventions. 282 *Chemical Invention of Sulphuric Acid. 276 New Mode of smelting Lead Ores. 282 *Chemical Invention. 283 *Chemical Invention. 284 *Chemical Invention. 285 *Chemical Invention. 286 *Chemical Invention. 285 *Chemical Invention. 286 *Chemic

SOCIAL CONDITION OF WORKING-MEN.

The social condition of the working-men of any country always excites the deepest interest in the minds of thoughtful people, for according to their elevation or degradation is the prosperity of the state or nation to which they belong. The truth of this statement is apparent to every one, and we have only to look at foreign countries to see illustrations. Men who are hard at work all day require some refuge—some quiet place to retire to, when their labor is over, so that both mind and body will be refreshed. In large cities temptations to vice abound on every side, and the wretched quarters provided for the accommodation of mechanics excite sympathy and call for improvement. Of late years an improved class of tenement-houses have been erected in this city: but these, although they add materially to the appearance of the city itself, contribute in a very small degree to the solution of the main question, which is--how to elevate the social condition of the working classes?

Quite recently attention has been given to this subject abroad; and it has been found that, by directing the attention of artisans of all callings to the provision of a home of their own, more can be done toward raising the social standing of the workmen than by any other means. It is only reasonable to expect that when a man of limited means, who has in fact, no capital whatever but his hands, is willing to run in debt, or to devote every cent that he can spare towards procuring and maintaining a home of his own, he will practice the most rigid self-denial, economy, and industry, and never tire in his efforts to accomplish his purpose. Upon these suppositions, or from similar motives, certain associations in England have been formed, which are called "Building Associations." These have for their object the procurement of comfortable homes for working-men, of which they are the sole owners and tenants. The practical operation of the scheme is as follows:-The capital is first of ground is then bought and divided up into lots, which are sold to workmen at a fair advance, to cover expenses and the interest on the investment of stockholders. The price of lots is from \$200 to \$300 action puts up houses on credit, which are paid for by the workmen in weekly installments of almost nominal sums. In this way a mechanic-in Birmingham, England, for instance—is enabled to purchase a house and lot, costing from \$600 to \$900, in about ten or fourteen years. The popularity of this system of ob-

taining a home may be estimated by perusing the sub-

taining a home may be estimated by perusing the subjoined paragraph cut from an English newspaper:—

The success of these operations appears marvelous to the visitor, who may walk for hours up and down streets built by these societies, and either already the property of the inhabitants or in course of being paid for. From 8,000 to 9,000 houses and gardens have the seen acquired by the operatives of Brmingham! There are about fifteen societies in the town, some for buying land and others for building houses. Some men pay in 2s., others 3s., and some even 6s. a week. The average ann al investment of the members of the societies—90 are about fifteen societies in the town, some for buying land and others for building houses. Some men pay in 2s., others 3s., and some even 6s. a week. The average ann al investment of the members of the societies—90 per cent. of whom are mechanics—is about £18 per annum. The enthusiasm of the workmen in making their weekly or fortnight payments is extraordinary; it has become, indeed, a kind of mania. Old indulgences are sacrificed, every effort is made to economize expenditure, and the most rigorous industry is exercised, so that the family may possess its own house. Altogether about £150,000 per annum is raised in Birmingham, collected by a few shillings a week from workingmen, and invested in these land and building societies. The acq isition of houses as their own property by workmen has entirely altered the character of the place. The magistrates say there will be no more riots—no more threats to march upon London. In Wolverhampton the same movement is going on. The land and building societies there n mber 4,794 members; they have purchased 150 acres of land, made 1,343 allotments for houses, 900 of which are built, and their gross receipts amount to £174,000. In Manchester there are between forty and fifty of these societies; in Liverpool not less than one hundred and eighty, but generally smaller than those of Manchester and Birmingham. There are numerous societies of this kind in the metropolis, Altogether, in England and Wales, there are said to be 2,000 land and b ilding societies, comprehending more than 200,000 members. The money paid in is estimated at £11,000,000, about £8,000,000 of which has been invested in property, the overplus having been repaid to depositors with interest.

The history of building associations in this country has been rather unfavored.

The history of building associations in this country has been rather unfavorable; and we might point out many instances where the most glowing expectations have been held out to working-men, which were never realized in the slightest degree. Building associations are a sore topic to many mechanics who have invested their little savings in certain well-laid-out (on paper) villages, and reaped nothing therefrom, except anguish of mind and bitterness of spirit; their pittance having been swallowed up in the transactions of rascally speculators. This is to be regretted and was solely the result of villainy, or at least mismanagement, and not any radical fault in the plan itself. There is no reason in the world why associations similar to those in England should not be started here with flattering success; but they must not set out with the idea that workmen are a set of flats," eager and ready to be gulled. Where everything is fair and above-board-where no absurd conditions are imposed-where building on the lot in a certain time is made a condition of sale, instead of putting up the house for the mechanic—there is no ground for apprehension of failure. Of course, it is necessary to make the investment in such an enterprise pecuniarly profitable to share-takers; but there are plenty of benevolent men in this city and other large ones, who would be willing to invest in such a scheme as is here mentioned, solely from a philanthropic point of view; provided they could be certain that their money would fall into the hands of honorable men, and not be made the prey of swindlers or others devoid of principle.

WHERE THE FUNDS FOR THE WAR HAVE COME FROM.

In the course of the last three years our armies have worn out and destroyed a thousand millions of dollars worth of property. Where did it come from?

At the commencement of the war large numbers of persons were the owners of personal property; some owning horses, cows, sheep, wheat and corn; others, barrels of beef and hogsheads of sugar; others, bales of dry goods; and others tuns of iron and coal. The whole of this personal property in the country amounted in the aggregate to some eight thousand millions of dollars, and about one eighth part of it has been handed over by its owners to the officers of Governsecured by shares subscribed by moneyed men; a plot ment, and consumed in military operations. This portion of the wealth of the country has been de stroyed.

Two powerful causes have operated to enable the community to contribute without inconvenience, this cording to the nature of it, and on these the associallarge proportion of its active capital to the government.

> One of these is the change from a credit to a cash system of trade. When our commission merchants sold goods on eight months' time, and our jobbers gave a credit of eight and ten months, a whole season's stock was bought by the country trader at one

time, and the tendency of the system was to cause large stock generally to be held on hand. A considerable portion of these goods belonged to the banks. The notes of the traders which the banks had discounted were simply certificates of an ownership by the banks of an interest in the merchandise for which the notes were given. When the credit system was abandoned the stocks of merchandise could be very largely diminished, and thus the Government found a great reservoir of unemployed capital from which to draw. The traders, having ceased to take notes for their goods, of course ceased to offer notes for discount. banks, seeing no other safe way of employing their capital, invested it in Government notes and bonds. The merchandise which formerly constituted the capital of the banks has been passed over to the Government and consumed, and the bank capital now exists in the form of Government notes and bonds. A great deal of individual capital also, which was released by the abandonment of the credit system, has been invested in the same way.

But the funds contributed to the Government have not come wholly from the stock of capital on hand at the commencement of the war. Before the war the wealth of the nation was rapidly increasing. There were a great many persons munity who did not expend the whole of their incomes, and the aggregate of these savings amounted to hundreds of millions annually. These were made partly in the form of merchandise and partly in railroads, houses, factories and other fixed improvements. Since the war commenced, these savings have been, to a considerable extent, passed over to the Government in exchange for notes and bonds.

CHEMICAL INVENTIONS.

The number of patents for chemical inventions taken out in this country is surprisingly small when compared with those obtained in France, or even in England. But there are signs that we are entering on a new era in this respect. One patent for a chemical invention, the vulcanization of india-rubber, has doubtless been of more pecuniary value to the parties in interest, than any other patent for an invention that was ever granted since the world began. On another page will be found a description of Prof. Everett's improved method of smelting lead ore, which he has secured by Letters Patent; and it is gratifying to see that we have to record the claims of these chemical patents more and more frequently.

It is difficult to understand how any intelligent chemist can resist the enticement to embark on the field of discovery and invention which is opened by this illimitable science. Before chemistry existed as a science, the accidental combination of two substances led to the discovery of glass, which performs so great and so varied a part in the affairs of life. Another mixture of three substances produced gunpowder, which has not only revolutionized the art of war, but which, according to Carlyle, has "made all men equally tall," and is therefore destined to overthrow nobilities and aristocracies, and to spread democracy over the whole earth.

Two elements, hydrogen and carbon, by their combination with each other, in different proportions and in different ways, produce hundreds of substances of very varied properties, many of these substances, as petroleum and illuminating gas, being of great pecuniary value. The 67 elements now known are capable, by their combinations, of producing an innumerable variety of substances. It is reasonable to suppose that, by the intelligent combination of these elements, substances will be produced more valuable than glass or gunpowder or illuminating gas. Indeed it is altogether probable that the progress of chemical discovery is destined to produce results more valuable than has entered into the imagination of man to conceive. Shall not the chemists of this country enter this field white for the harvest, and reap their share of profit and of fame?

ENGLISH ENGRAVINGS OF THE MONITOR TURRETS.

It has been seriously objected to, by a portion of the press, that foreigners should be allowed access to our iron-clads, it being asserted that they take advantage of this privilege and steal the plans for their