



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.
Simpson 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. V. NO. 26....[NEW SERIES.]....Seventeenth Year

NEW YORK, SATURDAY, DECEMBER 28, 1861.

TO OUR FRIENDS.

NOW IS THE TIME TO FORM CLUBS.

The present number closes another volume of this journal. We appeal to its friends in all sections of the country where mail facilities exist to endeavor to form clubs for the coming 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. Ten persons can club together and get the paper at \$1.50 each for one year. Twenty persons clubbing together can have it at the rate of only \$1.40. Think of getting a volume of 832 pages of useful reading matter, profusely illustrated with between 500 and 600 original engravings, for such a small sum of money. Single subscriptions, one year, \$2; six months, \$1. Even though the times may be hard, 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.

See prospectus on the last page of this sheet.

WAR WITH ENGLAND.

The commercial shipping of the world amounts to about fifteen millions of tons; of which England has about five millions, the United States about five, and all the rest of the nations combined about five. The nation ranking next to England and the United States is France, the commercial marine of which country amounts to about one million of tons. A war between England and America would be a war upon the ocean, and would result in the utter destruction of the shipping of both nations. The vast industrial resources of these two great communities would be directed mainly to this work of destruction. England has just refused to accept our assent to the abolition of privateering, and all seas would soon be swarming with our clipper ships and steamers amply armed and crowded with men in search for the rich prizes to be found in English vessels. Like swarms of rovers would issue from English harbors to prey upon our commerce, and the rich carrying trade of the world would fall mainly into the hands of the French and Dutch. When peace shall finally be restored, and the little doubtful point of international law settled, England and the United States will be degraded from their proud preeminence, and France will be the leading commercial nation of the world.

It is to be hoped that the common sense of the two communities will save us from the immeasurable evils of a war between us. This country cannot desire a war with England at any time, and especially not at the present time. If the English people are content to have our naval vessels treat her mercantile ships

as her cruisers have always treated our merchantmen, there can be no ground of quarrel between us. But if they seek by a mere quibble to force us to conduct different from that which they practice toward us, then they will find among us a spirit not inferior to their own. They should remember from whom we are descended. Sooner than yield to them any concessions not required by a fair interpretation of the law of nations, we shall accept the awful consequences of a war with them. The feeling of our people is well expressed by the remark of one of our merchants, the head of a firm that owns as fine a lot of vessels as sail out of this harbor. He says, "I have eleven ships on the line between this port and Liverpool, and I would sooner see them all rot at the wharves than to have Mason and Slidell surrendered."

THE OLD YEAR'S PROGRESS.

At the close of the year eighteen hundred and sixty we congratulated our readers upon a year of unexampled national prosperity. Never before had the fields and orchards of our husbandmen yielded so profusely, or our manufacturers and merchants enjoyed a period of more profitable success. It would have afforded us intense pleasure had we been able to close our present volume in the same tones of peaceful gladness; but in thousands of workshops, factories and farms, the hammer, the saw and the plow have been laid aside for the sword, the rifle and the cannon, and our country has become one vast camp of armed men. Fierce battles have been fought, and many brave men have fallen, and now "sleep the sleep which knows no waking." Still there is much to cheer and awaken faith and hope for the future. Many philosophers believe that wars are tribulations which exert similar influences among the nations that thunder storms do upon the atmosphere. They are evils while they exist, but when the clouds are dispersed, men breathe a purer and more serene atmosphere. May this be the happy consummation of our national troubles!

Although the vast insurrection has exerted a disorganizing influence upon many manufactures and other branches of business, it is really wonderful to witness the elasticity of our people, and the facility with which they have adapted themselves to altered circumstances. Many old branches of industry have been destroyed, but new ones have sprung up, and there is now a great amount of industrial prosperity enjoyed in most of the manufacturing sections of our country.

The war has stimulated the genius of our people, and directed it to the service of our country. Sixty-six new inventions relating to engines, implements and articles of warfare, have been illustrated in our columns, with no less than one hundred and forty-seven figures. These embrace a great variety of cannon, rifles, shells, shot, tents, kits and almost all articles found in the military vocabulary. Rodman's monster cannon, Dahlgren's howitzers, De Brame's revolving cannon, Winslow's steel cannon and several others have been thus brought before the public. No man can really be intelligent in matters relating to modern warfare unless he has made himself acquainted with these inventions.

Other departments of industry have also been well represented. Our inventors have not devoted themselves exclusively to the invention of destructive implements; they have also cultivated the arts of peace. In the present volume of the SCIENTIFIC AMERICAN—extending only over six months, one hundred and sixty different subjects have been illustrated, averaging from three to four figures each. It would take up too much space to enumerate all these, but in thus summing up our yearly progress in a general way, we can safely assert that for original and well-studied efforts of genius, they equal if they do not surpass the inventions of any former year. And as the number of patents issued is a very good exponent of the progress of our country, we can point to no less than 2,919 which is equal to the number (2,910) issued in 1857—four years ago. When the defection of eleven States, and the distractions of our country are taken into consideration, it is not too much to assert that our inventors have done better last year than ever before, and that inventions are perhaps the most safe and profitable sources of investment in times of war as well as peace.

Considering the nature and extent of the tremendous struggle in which our country is engaged, we have really great reason as a people, to feel grateful, and call this a prosperous year after all. Never before have our fields yielded so bountifully. The great West is surcharged with wheat and corn, and we are in the happy condition of enjoying a surplus of the necessaries of life. In thus viewing the past, we can still say with cheerfulness, thy face, old year, has been deeply furrowed by scars and tears, but it has also been illuminated with many sunny smiles.

A FEW WORDS TO OUR SUBSCRIBERS ON THE CLOSING VOLUME.

We are now at the close of another volume of the SCIENTIFIC AMERICAN, and shall commence a new one with our next issue. The subscription term of nearly five thousand readers will expire with this number, and with more than our usual solicitude we request a renewal of their patronage. We feel encouraged in doing this as we have received the most gratifying assurances from all our correspondents, that the SCIENTIFIC AMERICAN has been conducted during the past year, with even more than its former acceptability. It has furnished profitable and attractive information we trust, to all its readers, and its illustrations and typography are unequalled by any other periodical devoted to the literature of the mechanical arts. It has been the aim of its publishers and editors to make it a creditable representative of American invention and enterprise, and it is universally admitted that it occupies this position and stands alone as the popular expositor and repertory of American art and science. It is a periodical respecting which our mechanics generally have said they "feel proud of it, and it deserves the patronage of all." As it is impossible to maintain such a large, and cheap illustrated, paper without a very extensive list of subscribers, we solicit all our readers to exert their influence and to labor more than usual this year, to obtain for us new subscribers among their acquaintances. We know "the times are hard" with many of our mechanics, but the sum required for subscription is so small that almost every one can afford it with a little self-sacrifice, and we are confident it cannot be invested to a more profitable purpose.

The proprietors of the SCIENTIFIC AMERICAN will spare no effort to render the next volume acceptable to all its readers, and if possible superior to its predecessors. According to our established rule, the paper will be discontinued to all whose subscriptions have expired, but we hope to experience the satisfaction of not being required to erase a single name from our mail books.

THE CHEMISTRY OF IRON.

With this number, which completes the volume, we bring to a close our series of articles on the chemistry of iron. The subject is by no means exhausted, but we have described those compounds of iron which are most common, and which, consequently, are of the most general interest, and we have illustrated the most important principles of chemistry.

If we thought it would be interesting to any considerable number of our readers we should follow these articles by a series on the chemistry of coal; beginning at the foundation, as in the articles on iron, and tracing the subject through the production and composition of coal oil, illuminating gas and coal tar; and following the last complex substance into some of its most remarkable products, especially the new brilliant aniline dyes. This would lead us to an account of the latest discoveries in chemistry, which have not found their way into books, and we should endeavor to make all the subjects as plain as we have the compounds of iron.

We have some doubts, however, in regard to the extent to which these serial articles prove acceptable, and shall not commence a second series without waiting a little to hear from those of our subscribers who read with any interest our articles on the chemistry of iron.

An alloy of 78.26 parts of brass, 17.41 of zinc, and 4.33 of silver, with the addition of a little chloride of potassium to the borax, is recommended as the best solder for brass tubes, which have to undergo much hammering or drawing after joining.