

should) making the latter subservient to the former.

Again, we talk of the dignity of labor, and the majesty of toil. Which of us while at our avocation, whether of brain or hand, think, at the time the mental energy or physical strength is in use, that it is anything but work; work the necessity, not the pleasure. But when the book is written, the money made, the end accomplished, the rail-road built, the machine erected or the land tilled, and we see the results of our work and exertion, in the period of our recuperation, it is then that we feel that we are dignified, are majestic, and we feel grateful to the toil and labor which has made us so.

To moralize: No man should learn hard facts alone, let him acquire those which especially pertain to his business, and the comforts and affections of home, or the excitement of travel will balance these; but should he from inclination or ambition strive to acquire more, in order to keep on the line that bisects the angle, he must estheticise his knowledge, that is to say, he must find a poetry in the facts and a broad meaning for the world's good, in the phenomena. There must be a tendency to ponder and moralize, as well as to investigate, and the results of his moralizing must be based on a perfect knowledge of the premises. The want of this has caused the many errors of the day; the desire to strike out something new—to be original—being strong in man. The most original thinkers have been the most surprised at their own thoughts. With tyros (for whom we now especially write) this is a common fault. Learn well, first as a study; then speculate, as a recreation; and "isms" in knowledge will cease and wither before the overwhelming tide of common sense.

These may be called platitudes, but it is necessary now and then to reiterate them in order to regulate the investigations and thoughts of the day. Everyone will not take the trouble to read large books on the discipline of the mind, and a few remarks thereon are often useful to such thinking men as form the readers of the journals and periodicals of the day.

THE ATLANTIC TELEGRAPH & INVENTORS.

The secretary—Mr. George Seward—of the Atlantic Telegraph Company, invites inventors, patentees, and manufacturers of submarine cables to send plans or specimens of their cables calculated for laying across the Atlantic, to him at the office, 22 Old Broad-street, London. Accompanying this invitation, which has been advertised in the London papers, he states that the object of soliciting specimen cables and plans is to submit them to the consulting committee of the company "for examination, testing and experiment."

The names of those who compose the *Consulting Committee*, are not given in the advertisement, but we will give them for the benefit of those who may have the curiosity to know who they are. R. Stephenson, M. P., C. E.; I. K. Brunel, F. R. S.; E. Clark, C. E.; G. P. Bidder, C. E.; J. Hawkshaw, C. E.; J. Longridge, C. E.; Professor Wheatstone, F. R. S.; W. A. Miller, F. R. S.; Professor Morse; Professor Henry, Washington; Professor Bache, U. S. Coast Survey; Lieut. Maury; and W. E. Everett, C. E. Among this number there is not one to whom exception can be taken as a man of science, but excepting Wheatstone, Henry and Morse, we never heard of any of them being indistinguished, theoretically or practically in electric engineering. It would have been well had there been fewer civil engineers and more practical telegraphic operators in the consulting committee. There is something, no doubt, to be gained in influence, by presenting the names of such distinguished men, but at the same time it appears to us that these names have been obtained more for the purpose of giving dignity to the company, so as to give confidence to the public, than for the purpose of working out the best means of operation, both for testing the cable and laying it. The honorary consulting electrician is Professor Thomson, of Glasgow, the regular consulting electrician is C. F. Varley, London—both able men. No contract to commence operations for making a new cable will be made until \$1,500,000 are subscribed, and if this sum is not obtained the deposits that may be paid in will be returned to subscribers. The company is guaranteed a sum of \$170,000 from the British and American governments if the cable is laid and worked successfully. The new capital will consist of 120,000 shares at £5 (about \$25) each; this is called *preferential*, because the subscribers to it are to be first paid 8 per cent from the

profits, then, if there are any dregs left, the old shareholders are to get them. Old friends are generally the sufferers in such enterprises, like the original subscribers to the New York and Erie Railroad. We really hope, however, that the requisite amount for constructing and laying a cable will be obtained, and that at no very distant day from this. It has been stated that a proposition was made to raise the old cable and use all the parts of it that are sound; but we hope no attempt will be made to carry out such a preposterous idea. The old cable was totally defective in nature and construction, and the gross want of science displayed in its selection has left a very unfavorable impression on the public mind regarding the company—its directors, secretary, and all its officers.

A SPLENDID NUMBER OF THE SCIENTIFIC AMERICAN!

We are now preparing, and shall publish in the course of two or three weeks, the largest and most splendid number of the *SCIENTIFIC AMERICAN* ever issued. It will contain eight pages more than the regular issue, making in all 24 pages, with about 25 engravings executed in our usual style. As we announced at the beginning of the New Series, we shall spare neither time, talent nor expense in keeping the *SCIENTIFIC AMERICAN* what it is recognized to be—the most useful and best conducted journal of its kind extant.

We trust that our friends will use their endeavors to promote the circulation of our journal, thereby not only favoring us, but at the same time greatly benefiting every branch of industry in our country. As a practical commentary upon this suggestion, we present herewith a notice taken from the *Brooklyn Daily Times*—

THE SCIENTIFIC AMERICAN.—We were conversing with a tradesman the other day, who assured us that he would not miss taking the *SCIENTIFIC AMERICAN* on any account, and referred particularly to one improvement which he had been able to make in his business from a hint given in its columns, which added largely to his profits. Among the useful contents of this week's number is full information relative to patents as well as to all the matters interesting to the mechanical and scientific world. We notice a preventive of the frequent casualties by burning fluid which distress our readers and occupy our columns. If a garment be steeped in a mixture of phosphate of ammonia and sal-ammoniac, it is rendered as nearly fireproof as can be desired. All ladies who use burning fluid should try this recipe.

INVENTORS' EXCHANGE.

We have been often solicited to connect with our business, as solicitors of patents, an office for the purchase, sale and exchange of patents and patent property. We have always taken the ground that it was not compatible to connect the business of soliciting of patents and the sale of inventions together, for many reasons obvious to the understanding of inventors. We have, therefore, always declined to take any pecuniary interest in inventions; and so long as we continue to act as attorneys for soliciting patents for others, we shall refuse to become interested in any patents or inventions, so that no person can have a pretense for accusing us of neglect or imputing to us unworthy motives in conducting his business. In this respect we are bound to take the Bible doctrine, and abstain from all appearance of evil. In connection with these remarks, however, it is proper to inform inventors that an Inventor's Exchange has recently been opened by Messrs. S. A. Heath & Co., on the same floor with our extensive offices (but in no way, directly or indirectly, connected with the *SCIENTIFIC AMERICAN* Office); and those of our readers who desire an agent in this city to dispose of their patents, or to purchase for them good inventions, are recommended to correspond with Messrs. Heath & Co. direct. Messrs. H. & Co. inform us they have made extensive arrangements for exhibiting machines and models at the coming fair of the American Institute, and desire us to state that they will have efficient persons in attendance to describe the operation of the machinery which they will exhibit, and make sales of territorial rights, or solicit orders for machines, as the parties employing them may direct.

BURNHAM'S WATER WHEEL.—We learn since writing the description published on page 56, present volume, *SCIENTIFIC AMERICAN*, that at one mill it drives two pair of five feet corn stones and one pair of five feet wheel burrs, and grinds 21 bushels of grain per hour, besides driving all the machinery in the mill. The wheel is six feet in diameter and works under a six-foot head and face of water.

FOREIGN SUMMARY—METALS AND MARKETS.

The great prominent event of the week is the completion of the *Great Eastern* on the 8th ult.—the time specified for this result in J. Scott Russell's contract. On the subsequent day this achievement was celebrated by a grand banquet on board, at which there was quite an array of great men. There are two steam cranes on the decks for loading and unloading, and 5,000 tons of coal can be put into the bunkers in 24 hours. The fittings of the main saloon are magnificent, but several minor rooms are not to be completely furnished until the first voyage is made; still they are very neatly arranged. All the rooms and cabins are very lofty in the ceiling, being about 15 feet in the clear, which will make them exceedingly pleasant. The engines were tried before the invited guests sat down to dinner. She has separate sets for the two side-wheels and the stern propeller. The former were built by Boulton & Watt, the latter by Scott Russell; and great interest was excited in regard to their performance. Those for the side-wheels consist of four oscillating cylinders, each of 74 inches diameter and 14 feet stroke. Each forms a complete engine in itself, capable of easy connection and disconnection, and when united, they make four entire combined engines. Those for the screw are also four in number. Each cylinder is 84 inches bore and only four feet stroke, so as to work at the rate of 45 strokes per minute, with steam at 15 lbs. on the square inch, cutting off at one-third the stroke. The united power of the two classes of engines is 12,000 horse. Of course this power must be generated in the boilers, which are said to be very strong and sufficient to supply the requisite amount of steam. When loaded, this vessel will weigh about 30,000 tons, and, when driven by the 12,000 H. P. engines, a speed of 22 miles per hour is expected to be attained. In 1641—two hundred years ago—the navy of England consisted of 42 ships, the aggregate tonnage of which was 22,511 tons; now, what do we see in the progress of two centuries in England? One single steamship, belonging to the merchant navy, of a greater capacity than the whole fleet of the kingdom in the days of Cromwell. The engines of this great ship worked beautifully when put in operation, and the result was considered by all the engineers on board to be satisfactory in the highest degree and beyond what could have been expected. It is stated that her first ocean voyage will be to Portland, Maine; but she was built for the East India trade, and this is to be her ultimate destiny. In cases of emergency she can carry 10,000 soldiers, besides her crew, with all their equipments of war, and will be able to run down the largest frigate in the world as easily as one of our river steamers can run down a row-boat. This is the grandest experiment in ship-building ever attempted since the Deluge, and nowhere out of London, we believe, could the men and money have been secured for such a gigantic venture.

R. Mushet, the well-known metallurgist, has recently obtained two patents for new alloys of metals. One is for a compound of cast-iron and metallic tungsten; the other for combining a small portion of tungsten with cast-steel, whereby the quality of the latter is stated to be greatly improved.

Mr. C. Beslay, of Paris, has lately secured a patent for coating articles of iron or steel with tin, zinc or lead, or alloys of these metal, by electrical deposit. In the galvanic batteries which he employs for depositing these metals on the iron or steel, such as knives, &c., he employs a solution of caustic soda or potash instead of acids. The alkaline solution dissolves the tin and lead to form the coating without engendering any tendency to oxidise the metal which is to be coated, and thus a very permanent and adhesive deposit is made.

At a late meeting of the Electric and International Telegraph Company, held in London, a dividend of 6½ per cent per annum was declared. R. Stephenson, M. P., acted as chairman, and in making some remarks, he recommended a large reserve fund to meet the expense of wear in the cables. He stated that some submarine cables were worn out in five years, others in ten, and as the company had expended £140,000 in cables, £14,000 should be laid past as a reserve every year to renew their cables in ten.

THE DEMAND FOR COTTON.—The efforts of the Manchester Cotton Supply Association seem to be producing some good results in spreading the cultivation of cotton,