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 16.....[NEW SERIES.]....*Seventeenth Year.*

NEW YORK, SATURDAY, APRIL 20, 1861.

FLAX AND COTTON.

The flax question is now engaging considerable public attention. This is owing, in a very great measure, to the present state of affairs in those States which furnish the great supplies of cotton. Several articles have lately been published in the Boston papers in which the culture of flax is recommended to our farmers as a profitable crop, and assertions have been made that it can be so treated as to be rendered a cheap substitute for cotton. To render it fit for spinning on cotton machinery, it is proposed to *cottonize* it, by cutting it into short lengths, then treating it chemically, so as to split it up into fine fibers like wool. About ten years ago, Chevalier Claussen discovered a mode of cottonizing flax chemically, and for about a year or two afterward much was said and much published in England about the probability of this discovery rendering flax a cheap substitute for cotton. All these anticipations were doomed to be extinguished, as the process was found too expensive, and the flax-cotton proved unsuitable for spinning, so as to compete with its rival.

Perhaps no man has devoted more attention to this subject in our country than Stephen M. Allen, Esq., of Massachusetts, who appears to be a firm believer that flax can be rendered a substitute for cotton in the manufacture of cheap fabrics. In the month of February, last year, he delivered an address before the Massachusetts Legislative Agricultural Society, in which he stated that his experiments had been successful in cottonizing flax, and that machinery for this purpose was then being constructed for several mills in New England and the West. He also stated that the flax fiber thus produced was capable of being spun and woven either on cotton or woolen machinery, and that it was suitable for mixing with cotton and wool in small or large proportions, and that a more beautiful and stronger fabric was thus obtained. Specimens of mixed woolen and cotton goods, containing from seventy-five to forty per cent of flax fibrilla were exhibited on that occasion, and pronounced beautiful. Mr. Allen also declared before the Rhode Island Society for the Encouragement of Industry, that flax-cotton could be produced in large quantities "in every Northern State, and that it will spin and weave on ordinary cotton machinery, make a better article of cloth, and cost less than cotton." Such statements as the foregoing are being revived at the present time; they should not be despised, but they should be received with great caution. If flax-cotton can be furnished for lower prices than common cotton, and if it will answer a similar purpose equally well, it has only to be brought to the market for sale, when it will be sure to find plenty of purchasers.

A correspondent writing to us from Springfield, Mass., on flax-cotton, takes a practical view of the subject. He says:—"As the strength of fabrics composed of flax is due almost entirely to the great length of each fiber, what is the advantage of subjecting it to a very expensive process to cottonize it by shortening the fiber, thereby reducing its strength? It is true flax-cotton may be spun on common cotton machinery, but long flax fiber can be spun on flax machinery for two-thirds the cost of spinning cotton. It is therefore absurd to reduce flax to the cotton state." He also asserts that flax cotton costs fifty per cent more than common cotton, and that bulk for bulk it is twenty-eight per cent heavier. These statements are based upon experimental knowledge and deserve attention.

If some new discoveries were made whereby fine flax could be prepared as cheaply as cotton for spinning, then it would be preferred for most purposes as as a substitute, because linen fabrics are far more beautiful than those of cotton. Flax, however, requires to undergo several operations—chemical and mechanical—to fit it for spinning, while cotton only requires ginning, the former therefore cannot stand in competition with cotton, so far as relates to cost. The history of cotton affords an instructive lesson on this head. Before the discovery of the Whitney gin, the expense of cleaning common cotton was so great that it was dearer than fine flax. In those days flax was universally cultivated by European and American farmers, both for domestic clothing and for sale. Every farm in New England had its patch of flax, and almost every house its weaving loom, and throughout the whole of Christendom, at that period, cotton was but little used.

The wand of the magician inventor has changed the face of the country and revolutionized the manufacturing art. The fields of waving flax have nearly all disappeared from our hills and dales, and the loom is no more heard in every household weaving its flaxen web for family clothing. Cotton has taken the place of fine flax for most purposes, simply because it is produced at much less cost. But while we make these undeniable statements respecting cotton, we at the same time believe, that with more science and skill, flax may be extensively and profitably cultivated by our farmers. This part of the subject, however, we must leave for another occasion.

SHIPS' COMPASSES—DANGEROUS ATTRACTION—ENGINES AND IRON HULLS.

Since iron has commenced to enter so largely into the construction of ships, the errors of the compass have become very frequent and dangerous. Any useful information on this subject has, therefore, a special claim upon maritime nations, and upon none more than ourselves. A very interesting paper on this topic was lately read before the Convention of Naval Architects, in London, by F. I. C. Evans, R.N., superintendent of the compass department in the Admiralty. He stated that in sailing vessels, the north pole of the needle was almost invariably drawn towards the ship's head, but the action, in all cases, was very limited in power. In steamships with wooden hulls, the machinery oftentimes disturbs the needle, and the magnetic force varies in direction, according to the arrangement of the engines and boilers; therefore great care should always be observed in fitting up machinery so as to arrange it in such a manner that the least possible attraction will be exerted to disturb the true action of the needle.

In most all iron vessels the errors produced in the compass by local attraction are very uncertain and dangerous, and more so than is commonly suspected by the builder, owner or navigator. In constructing an iron steamer, the hull very frequently becomes a large magnet divided into two portions, similar to a magnetic bar, having a north and a south pole. This is caused by the repeated hammering necessary in riveting the plates. When this is the case, the poles of the iron hull attract and repel the poles of the delicately-poised compass needle and render it unreliable. It has been found that different kinds of iron used in shipbuilding possess different magnetic qualities. The softer the iron, the more subject is it to great magnetic changes, and therefore the more likely to lead to errors in the compass and to increased dangers in navigation.

It has also been noticed that iron ships are in more danger from local attraction immediately after being launched than after they have made one or two voyages. Owners of iron steamers should, therefore, be very careful not to send them to sea very soon after they are launched, but first trim them carefully, and be sure to have the compasses perfectly adjusted before a voyage is undertaken. An iron ship should be thoroughly tested with the compass when the hull is completed, and when being equipped and its engines put in, its head should always be turned in a contrary direction from that which it occupied when the hull was in process of construction. As iron steamers which have their engines put in before being launched cannot comply with these arrangements, it would be better not to fit up machinery in any case before launching. After the engines are fitted up in working order in a steamer, they should be kept constantly moving for several days at the dock, before a trip is undertaken, even when all the parts are in working trim. This suggestion is made in order that the magnetism acquired by the hull through the riveting operations may be "shaken out." The long vibrations of the engines will tend to destroy the induced magnetism in the mass of iron which results from the hammering of the plates, as the magnetism induced by the latter is due to long-continued and short vibrations.

"The Wealth of Nations."

Since commencing our series of articles on wealth, we are frequently asked what is the best treatise on the subject, and we devote one short article to a general reply to the question.

Until the middle of the last century all governments seem to have been under the delusion, which is still not entirely rooted out, that the wealth of a country was to be increased by some law or other device, for "keeping money in the country." In 1766, Adam Smith, after holding the professorships of logic and of moral philosophy at Glasgow, and traveling over the continent of Europe with the Duke of Buccleugh, retired to his native town of Kirkaldy, in Scotland, where he spent ten years in producing that immortal work, which is slowly but steadily changing the legislation of the whole civilized world. It was said a few years since, that the cavity was still to be seen in the plastering, worn by the great thinker's head as he leaned back rapt in his profound meditations. The main drift of Smith's "Inquiry into the Nature and Causes of the Wealth of Nations," is to show that the wealth of a people is not obtained by getting it out of the rest of the world, but is produced by the people's own industry, and accumulated by their individual economy. The views of Adam Smith have since been arranged and illustrated by other writers. The text book used in teaching this science for many years in most of our colleges has been Say's "Political Economy," a methodical and exhaustive treatise on the subject by an able Frenchman. This has been superseded to some extent, within a few years, by the work of Professor Bowen, of Cambridge, perhaps the most learned work on the science that has ever been written. Professor Bowen argues in favor of protective duties on imports, but not on the exploded ground of "keeping money in the country." There have been writers on political science, as there have on all other sciences, who did not understand what they were talking about; the most distinguished of these was Dr. Chalmers, whose work is a confused mass of nonsense. The treatise which we think will be found most acceptable to the general reader is that of Dr. Wayland, ex-President of Brown University. It is embraced in a small volume, and is marked by the comprehensiveness and wonderful transparency characteristic of the writings of this great man.

The Lawrence Model Lodging House.

The late Abbot Lawrence, of Massachusetts, left $50,000 to be appropriated to the erection of model lodging houses, so that the poor might have a convenient and comfortable home at a moderate rent, and to show capitalists that they can get fair interest for their money by building such structures. His executors, after much deliberation, have adopted the following plan, which is worthy of imitation by tenement builders in all our cities:—

Each will be be nearly rectangular, 41 feet wide by 63 feet long, four stories high, with French roof; built of brick, with freestone dressings. The building will be so located on the lot as to admit of drive ways upon all sides, thereby giving an abundance of light and air to all the tenements. There will be four tenements upon each of the five floors, arranged with four rooms for each tenement, with closets, such as water closet, store closet, coal and wood closet and clothes presses. Each tenement is entirely separated from the other tenements by brick partition walls. The entrance hall or street passage is in the center longitudinally, and runs quite through the building, with a rotunda in the center, 16 feet in diameter, in which are placed upon either side of the hall passage a flight of cast iron stairs. The hall passage, as well as the walls of the rotunda, are built of brick, and the floors are built with brick throughout, rendering the entrances from bottom to top nearly fireproof. In the basement will be arranged a store cellar for each tenement, and a public bath room. All the rooms will be amply lighted and ventilated.