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REMOVAL.

The Scientific American *Office has removed from its old location, 128 Fulton st. (Sun Building), to No. 37 Park Row (Park Building), where all letters, packages, and models should hereafter be addressed. Entrance is had to the office also at No. 145 Nassau st. Munn & Co.'s American and European Patent Agency is at the above office.*

Floods—Embanking Rivers.

Most rivers are subject to annual swellings and depressions. The cause of this is the melting of snows near their sources, and the falling of periodic rains, succeeded by seasons of comparative dryness. The floods come down charged with loose soil, and spread over an extensive area beyond the natural beds of the rivers, and on retiring within their channels deposit much of their alluvial matter. In the course of centuries, these deposits form those deltas on the river banks, which are distinguished for agricultural fertility. The annual freshets, however, to which overflowing rivers are subject render their deltas uninhabitable, unless protected by embankments for keeping out the waters. The fertility of the low lands on river banks was known at an early date in the history of man, and means were devised by the ancients in Egypt and Assyria for reclaiming them from the floods, and rendering them adapted for supplying nations with waving fields of golden grain. The art of river embanking, or leveeing, as it is more generally called among us, found its way into Europe from the East, and it has attracted much attention in our own country, especially in the Southwest, where the richness of the "Mississippi bottoms" is proverbial. A work on this subject, by William Hewson, civil engineer, has just been published by John J. Reed, Center street, this city, and from a perusal of it, we are satisfied that the author is acquainted with his subject both scientifically and practically.

Two causes, he states, operate to produce floods; one is the irregularities of river beds—the other, irregularity in rain-falls. The former are within the fields of human effort to counteract, and therefore form a special subject of inquiry. He also states that rivers decrease in the rate of their descent as they approach their outfall. Thus the average fall of the Mississippi river for the whole distance from the confluence of the Ohio to the Gulf of Mexico is about three inches per mile, but if the channel were straight, the uniform descent would be about six inches. During a flood, this river rises to 50 feet at Cairo, Illinois; 42½ feet at Friar's Point, Miss., and only twelve feet at New Orleans, thus showing a very great difference in the declension of rise, as the river passes downward.

It has been asserted by some writers that one river may absorb another of equal magnitude with itself, without producing a rise of its surface; and Cressy, in his "Encyclopædia of Engineering," takes this ground, asserting that the Tiber, in Italy, swallows up the Teverone without becoming deeper or wider. Of course, if this were the case, there must be the production of a double velocity in the waters. Mr. Hewson states that Cressy and Eytelwein, who have made such statements, are mistaken regarding the depth. The Mississippi is contracted below its junction with the Ohio, and it really grows narrower as it flows on after swallowing up all the great rivers that flow into it. It is a mile wide at Cairo, Ill.; at New Orleans, it is only half a mile wide. This is rather a remarkable circumstance, but our author explains the cause. The Mississippi, as it grows narrower, becomes much deeper, and as a consequence, having less resistance, its velocity is much increased. As a practical application of this conclusion, in the case of the Mississippi river, Mr. Hewson says, "it may be therefore safely affirmed that the retention of flood water in the channel by levees, like all tributary accessions to its volume, while deepening the channel and increasing the velocity, will not, as a direct consequence, elevate the surface of the water." This is a very important conclusion; one which, he states, appears to be paradoxical, "but is drawn fairly from undoubted premises." This is certainly a most interesting question, because if this conclusion is correct—and it appears to be so—a wide field is here opened up for the profitable reclamation of many vast marshes along river banks, and the conversion of them into fruitful fields.

But there is another result of still greater importance than this connected with embanking rivers. This is no less than the growth of the lands or reclaimed deltas. Thus, by raising levees on the Mississippi, the bottom lands have been greatly increased in amount—no less than 96 feet per annum. The unleveed portion of the Po, in Italy, showed an annual increase of only twenty-two feet of delta, but since it has been embanked throughout, it has gradually increased to 229 feet annually not that the ground has grown in hight, but the dry land has increased in extent. In England and Scotland, the embankment of rivers has produced wonderful results. By increasing the velocity of the volume of the rivers, their beds have been scoured out, and the channels deepened during floods, so that these very levees have also operated to produce a drainage effect upon the adjacent low lands during low water. Here is a fact worthy of the attention of those who would engage in reclaiming the rich delta lands on our Western rivers by erecting strong levees.

The method of constructing river embankments is ably treated by Mr. Hewson. He urges the utmost care upon all engaged in this branch of engineering, in the erection of good foundations and solid embankments in the first place, which is certainly very important. Our object is to direct attention to the benefits which may be secured by levees in certain situations, and to the engineering science and practice connected with it.

Treating Flax.

No fabric is more beautiful than linen. For garments and drapery it had always the very highest place among rich and poor. Flax is unequalled for variety of texture, as it is made into huge cables capable of bridling a ship of war, and into threads more attenuated than those of a spider's web, for the manufacture of Belgian lace. The finer qualities of linen are very costly, and the coarser kinds much more so than cotton. This is owing to the processes, through which flax is required to pass, to render it fit for those operations which separate the fibrous from the woody matter. "Fine linen, clean and white" is a term used in Scripture to denote a chaste and beautiful appearance, and assuredly there is no more beautiful fabric than fine white linen. It is rather remarkable that, although we have millions of acres in America of the finest soil for growing flax, we do not raise any worthy to be compared with that of Russia, Holland or Tuscany, and there is not a single yard of fine linen, so far as we know, manufactured from one end of our country to the other. This is not very creditable to us, because this question is one which is as old as the establishment of our first colonies. We know that good linen may be made from American flax, because we have seen some home-made shirting made from it which was nearly as fine as the common imported qualities. A linen factory was established at Fall River, Mass., a few years since, but we have not yet seen any of its productions in the market, although thousands of yards of foreign qualities are sold daily.

Some valuable discoveries in the preparation of flax we hope will yet be made, so as to cause a complete revolution in this branch of the manufacturing arts. This was expected from the flax-cotton of Claussen, about which so much was said a few years since, but it turned out a delusion. From this, however, we have no reason to conclude that new improvements cannot be made; on the contrary, the field is more inviting than ever to the experimenter.

An improvement in this department of the arts has recently been patented in England by J. J. Cregeen, of Rotherhithe, which appears to be a move in the right direction, and may lead to important results. It is applicable to the treatment of jute, hemp, China grass, flax, and all the fibrous vegetable stalks which contain resin or gluten. He first steeps them in hot water of 120° Fah. for forty-eight hours, after which they are washed in warm water, and during the operation are continually passed between fluted rolls. Subsequent to this they are crushed between large rollers that have blunt teeth on their circumference, by which action the woody matter is entirely broken, but the fibrous unInjured. After this operation, the flax is dried, and the shive, or woody substance, is easily driven off by a slight scutching in connection with a fan blast. The flax is next steeped in a tank filled with half-formed soap composed of oil and a solution of ammonia. This steeping process lasts for about twelve hours, the heat of the liquor being maintained at 90° Fah. The flax is now taken out dripped, and again washed in hot water in a tank, during which operation it is also kept passing between fluted rolls until it is quite clean. By this treatment very little tow is made, the fiber is preserved in full length, and is very glossy and of a silky appearance. Jute and some other kinds of flax cannot be spun without being soaped, and a preparation of oil and soda is sprinkled upon it for this purpose, but no steeping takes place in such a liquid, as by the process described. No doubt the steeping in the hot liquors, and then in the saponacious one, is troublesome and expensive, but it is asserted that the finer qualities of yarn can thus be made from almost all kinds of vegetable fiber.

Young's Coal Oil Patent.

The remarks with which we accompanied the publication of Young's patent, on page 186 of the present volume of the Scientific American, have caused considerable commotion among many who are interested in the manufacture of coal oils. We stated that the patent seemed to cover the manufacture of oils from coals and such like mineral substances by distillation, and that unless it could be proven that some other person had made the discovery prior to the patentee, it would be sustained. We have received a communication this week from Washington, which points out how "the patent may be broken down" (we copy this expression from the letter of our correspondent) upon another principle, namely, the non-fulfilment of the conditions embraced in the 15th section of the Patent Law of 1836. This provides that the patentee, if an alien, must put and continue his invention or discovery on sale to the public on reasonable terms, eighteen months (or earlier if he chooses) after the patent is issued; and failing to do so, it becomes invalid. If Mr. Young has not complied with this provision of the Patent Law, of course, his patent has become forfeited to the public.

We have no information upon this important point, but should it prove that Mr. Young has failed to introduce his improvement in accordance with the provision of the law above cited, it will afford another illustration of the severity of our miserable system of discriminating between foreign inventors and our own citizens.

Colored gelatine is a very good substitute for glass to make illumination lamps and the like, and it can be molded into any form.

New Steel Wire.

Of late great improvements have been made in the production of iron and steel in England, and wire has in its turn been greatly improved, both in the quality of the stock employed, and the processes of manufacture. The British Admiralty, by fixing a standard for their cable, first led the inventors of that country to improve the quality of wire, and when the makers began to vie with each other the standard was soon left behind and much greater excellence attained. The latest and greatest improvement is the patent steel wire of Messrs. Webster & Horsfall, of Birmingham, of which we are favored with some particulars by Mr. Nunn, their agent in this city. He, himself, has been for many years a wire-maker, and knowing, as he does, the various qualities in the market, his decided opinion as to its superiority is worth a great deal among those who use this article. The *Icarus*, *Pandora*, and *Melpomene*, three steam frigates of the largest class in her Majesty's navy are being rigged with it, and the British Admiralty Report endorses its great strength and especial applicability to the manufacture of rope cable or rigging. We find that it takes 2,800 pounds to break a No. 10 patent steel wire, while the same gage iron wire breaks with 800 or 900 pounds; a No. 16 patent steel wire is broken with 1,100 pounds, and the same gage iron wire is broken with a strain of 300 pounds. Thus a steel wire need only be one-third as heavy and bulky to bear the strain of iron, and this lightness will extend its application to rigging and mining purposes.

The comparative strengths of new steel wire and hemp, when made into cable, will be seen at a glance by the following table of the relative diameters of the same strength made from actual experiments:—

Steel Wire Rope.	*Hemp Rope.*
5 inches	14
4¾	13
3½	12
3	11
2¾	9
2	6½
2½	5½

We are glad to say that it has been introduced into this country by Mr. Nunn, and at every trial has proved to be an invention of great importance.

Indian Improvements.

While Britain's soldiers are busy reconquering India, her engineers are not idle. Roads, aqueducts, and railways are everywhere progressing and steamboats of light draft are advancing on the waters of her most sacred rivers. A steam ferry is to be established on the Indus at Attock and there will soon be more. A railway bridge over the Jumna, built of stone and iron, is about to be constructed and it will be a great work, when finished. The following are some details on the subject.

The length of the bridge between the abutments is 3,224 feet, the number of openings, 15, the distance from center to center of the piers, 219 feet, and the depth of the bottom of the foundations below low water level, 50 feet. The railway will be 81 feet above low water level.

This is a new aspect in the history of war, to conquer first, then plant—not your standard—but the steam engine, and leave it to work out that truer victory which is gained by the supremacy of the arts of peace.

Dreadful Steamboat Explosion.

On the 27th ult., the most dreadful explosion which has taken place on the Mississippi since the new steamboat law went into force occurred near Baton Rouge, by which two hundred persons, it is reported, lost their lives. The steamboat was the *Princess*, bound to New Orleans, from Vicksburg. Correct accounts have not yet been obtained regarding the cause of the explosion, but it was no doubt owing to an overpressure of steam, and too little water in the boilers. Most of those who lost their lives were ladies. This boat was considered one of the finest on the river.