SCIENTIFIC AMERICAN

A WEEKLY JOURNAL OF PRACTICAL INFORMATION, ART, SCIENCE, MECHANICS, CHEMISTRY, AND MANUFACTURES.

Vol. XXXIII.—No. 25. [NEW SERIES.] NEW YORK, DECEMBER 18, 1875. [$3.20 per Annum. [POSTAGE PREPAID.]

A NEW GRAIN ELEVATOR.

A new grain elevator in New York city is now in process of construction by the New York Central and Hudson River Railroad Company, which is designed as the beginning of arrangements for the accommodation of a great grain trade which ultimately will tend to direct a large trade, to New York city in this line.

The magnitude of the future facilities for cheaply handling grain in New York can be inferred both from the requirements of the large traffic of the Central and Hudson River Railroad and from the fact that, with that line, other lines will necessarily be brought into active competition, and so led to provide adequate terminal accommodations for their own benefit. The Pennsylvania road has already recognized this, and, it is reported, contemplates the erection of an elevator as large as that of the New York Central Company, and subsequently of building one of double the size, capable of holding 3,000,000 bushels of grain; while the Erie, we learn, proposes to construct a small transfer elevator of 100 000 bushels capacity, and probably in the future a building of much greater size.

At the present time New York suffers from no lack of storage capacity for grain taken from vessels. There is an abundance of floating elevators, and the stationary edifices will, together, accommodate some 12,000,000 bushels. The absence of railroad elevators has, however, rendered the handling of the enormous quantity of grain arriving by rail both costly and difficult, in a degree which may be estimated from the fact that the same has now to be shoveled by hand from the cars of the New York Central and Hudson River road into canal boats. and by the latter transported to storage houses to the lower part of the city.

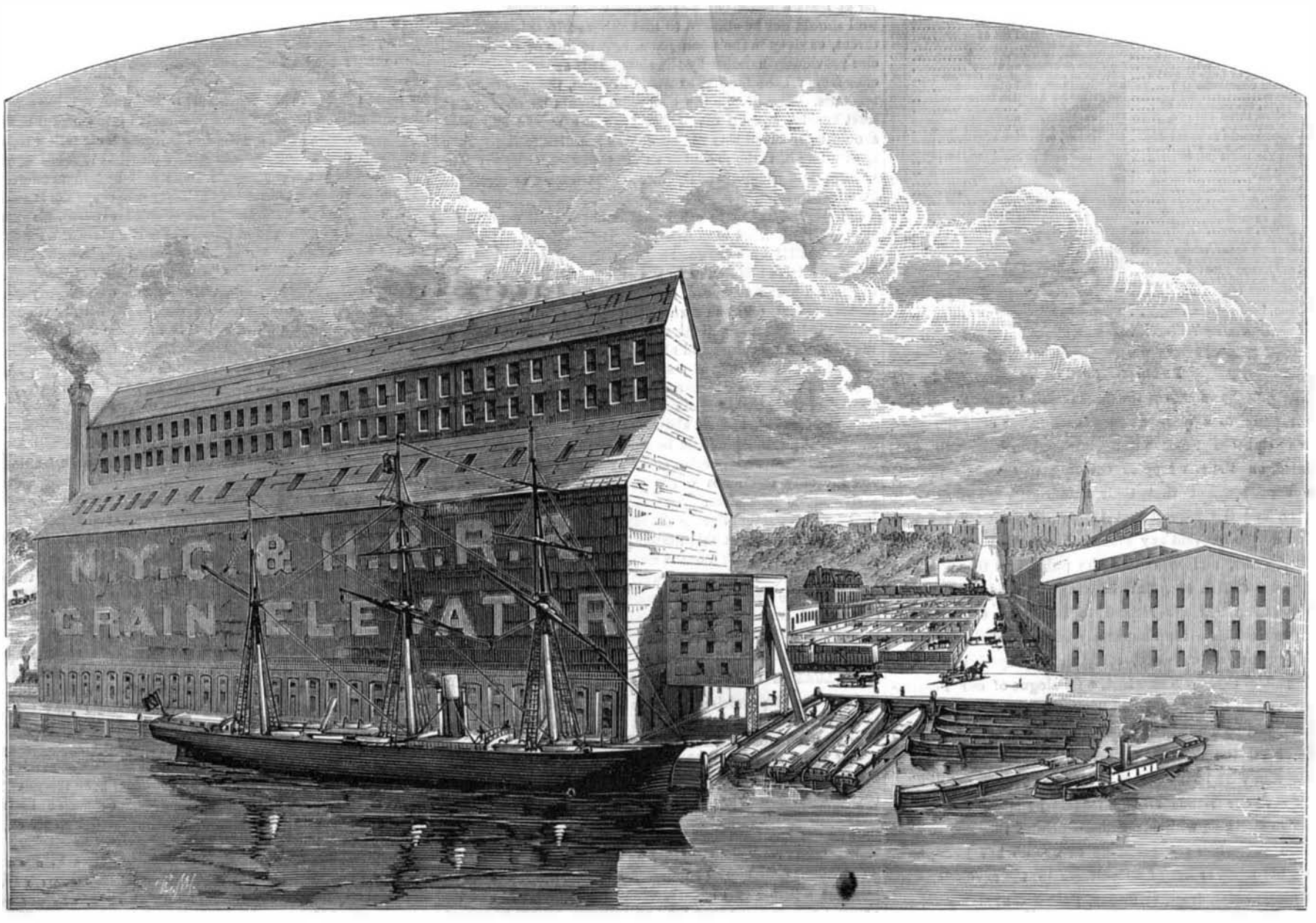
The opposition to building elevators on the part of the railroad managers has been based on economical motives. The grain-grading system now existing, through the agreement between the Produce Exchange and the roads, has hitherto not been favored; and as a result, under the old plan (it being necessary to deliver the identical grain received for storage) such grain would have to be stored in a separate bin even if it did not nearly fill the latter, so that it was practically impossible to utilize even half the capacity of the accommodations provided. The present system obviates this trouble, and admits of the employment of nearly the full capacity, through proper weighing and inspection, by which the exact amount of the same quality, etc., of grain is returned to the storer: though such is not the identical material, as several consignments may be mingled in one or more bins, in order that the latter may be completely filled. Another obstacle has been found in the fact that the buildings must be erected on the Hudson River, and suitable bottom for laying foundations has hitherto not been reached. This difficulty has, by dint of persevering search, been overcome, and now the Central, Erie, and Pennsylvania roads have, on their respective properties, found solid bottom at a depth of some 75 feet.

The New York Central and Hudson River Railroad Company's elevator, at the time of writing, exists partially in the shape of foundations and partially on paper, in the form of plans. Mr. Charles Hilton is engineer in charge, and through the courtesy of Mr. C. B. Gerard, the assistant engineer, we have obtained the following facts in regard to the edifice, and from the drawings our artist has prepared the accompanying accurate representation of the structure as it will appear when completed one year hence. The building is located between 60th and 62d streets, and on a line with Twelfth avenue. It is 354 feet in length by 100 feet in width, and 160 feet in hight, and contains 264 bins, each 65 feet high, having a capacity of 6,000 bushels each, or an aggregate capacity of over 1,500,000 bushels of grain. The foundation is composed of some seven thousand piles driven into the river bed at intervals of 2 feet 9 inches between centers. These are cut off below low water level, filled in with sand, and transversely capped with heavy timbers. Two diagonal cappings follow above, and a series of granite piers, pyramidal in shape, finally support the ponderous timbers which sustain the bins. The superstructure is of brick outside to the top of the bins, and slate above.

At the north end, four tracks enter, and between the outside pairs twenty-two receiving pits are made, each pit holding one car load of grain, and so located as to come just abreast the car doors. Steam shovels are to be used to remove the grain from the cars; and the grain is then carried by the elevator leg, which enters each pit, to a receiving hopper above the bins. The power for elevating is furnished by a 500 horse power double engine. As soon as the receiving hopper is filled, an attendant on the ground floor opens a valve and allows its contents to run into a weighing hopper placed beneath. The scale rod is also in the lower story, though connected with the hopper far above by suitable devices, so that the weight is easily read off. The weighing hopper may be rotated on a vertical axis, and is provided with an inclined spout. This spout traverses the interior periphery of a ring, into which opens a series of conduits, leading to twenty-four adjacent bins. By means of a wheel and index hand, the attendant can adjust the hopper spout against any desired bin chute, and it only remains to open a valve to deliver the grain into the bin. Meanwhile the receiving hopper valve has been closed, and the hopper is being refilled, so that the raising of the grain is continuously carried on. At the bottom of each bin is a spout, and under every fourth row of bins there is an endless moving belt. Bags, after being filled at the spouts, are thrown upon the belt, and thus transported to the vehicles at the delivery door.

In order to accommodate shipping, a separate hopper is provided, and a spout therefrom leads outside the building to the hold of the vessel. Arrangements are also provided for removing grain from boats, the elevator leg for this purpose being 60 feet in length and capable of vertical adjustment over a distance of 20 feet, to suit varying conditions of tide, etc.

Our engraving represents the new elevator, and also affords an idea of another edifice, probably the largest of its kind in the world, and of the extensive yards owned by the New York Central and Hudson River Railroad Company and let to the Union Stock and Market Company as a receiving station for the immense droves of live stock received from the West over the Hudson River road. The sheep and hog house, which very recently has been completed, is shown in the distance. It is a brick structure 370 feet long by 200 feet wide, and is



THE NEW YORK CENTRAL RAILWAY'S GRAIN ELEVATOR AND STOCK YARD

divided into one section 100 feet in length and three stories high, for the reception of hogs, and another occupying the remaining space, but four stories in hight, for beeves, calves, and sheep. The ground floor is utilized for cattle and the upper stories for the sheep, broad inclined planes being the means of ascent. The interior is thoroughly illuminated by a large skylight and innumerable windows, and the ventilation, obtained by flumes and hundreds of apertures in the walls, is thorough; 20,000 hogs, 30,000 sheep, and 2,000 calves can be accommodated at once on the various floors, which aggregate in area nearly seven acres. The yards outside offer quarters for 4,500 head of cattle. The land included in these new improvements, for conducting freighting business by this company, is some 20 acres, nearly all of which is made or filled-in ground, which has heretofore been useless.

Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT

NO. 37 PARK ROW, NEW YORK.

O. D. MUNN. A. E. BEACH.

TERMS.

One copy, one year, postage included.....$3 20
One copy, six months, postage included..... 1 60

Club Rates.

Ten copies, one year, each $2 70, postage included.....$27 00
Over ten copies, same rate each, postage included..... 2 70

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VOLUME XXXIII., No. 25. [NEW SERIES.] *Thirtieth Year.*

NEW YORK, SATURDAY, DECEMBER 18, 1875.

Contents.

(Illustrated articles are marked with an asterisk.)

PUBLISHERS' CARD.

The present volume of the SCIENTIFIC AMERICAN is drawing rapidly to a close. The next number ends the year. Some eighteen thousand of our subscribers will find, printed on their wrappers covering this week's papers, the announcement that their subscriptions are about to expire, and the request that they will remit for the new volume. To prevent any break in the conti- nuity of their subscriptions, and to enable the publishers to know how large an edition to print at the commencement of the year, subscribers are invited to remit for a renewal as early as possible. Simultaneously with the mailing of this week's paper, an envelope, containing Prospectus for 1876, a beautiful chromo Name List, a Catalogue of our Publications, and an Illustrated Hand Book, useful for inventors and others, will be mailed to all our subscribers; and we hope to receive all the lists back again filled with the names of those who wish in the future to take our paper.

To save our friends all the trouble possible, we also inclose an envelope with our address printed thereon, so that all the subscriber and getter-up of a club has to do, is to place his name or list of subscribers in the envelope, with the postal order, draft, or money, put a 3 cent stamp on the former, and drop it into his post office.

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DIPHTHERIA.

There has been recently in this city, and throughout the country, quite an alarming spread of diphtheria, amounting almost to an epidemic. The disease is one which fastens on children most readily, although it attacks adults with often fatal effect. Its chief causes are neglect of proper sanitary precautions and the inhalation of foul sewer gas and of the emanations from damp and badly drained ground. We believe that it is not realized, by dwellers in and owners of our city houses, how imminent the danger of such disease is, or else we should see more efforts directed by private individuals toward the closing up of any possible avenue of entrance for mephitic gases into dwellings. It may be laid down, as a general rule, that the merest whiff of sewer gas pervading a hall or room should be considered as a signal of impending peril, and not a moment's delay should intervene before measures are taken to discover its origin. If the drain pipes in a house are properly constructed, there should be no smell whatever; and the first points to look to are whether there is a good trap in the sewer pipe in the cellar, and whether there is a ventilating tube leading from the soil pipe into a chimney, or to a hight at least two feet above the roof. If not, these additions should at once be made. If a tenant be the sufferer by foul odors, and the proprietor neglect the proper safeguards, in this city, the former has only to apply to the Health Board, when an inspector will examine the premises, and the result will be a peremptory summons to the recreant landlord to make the necessary alterations within three days or thereabouts, or in default pay a fine, and also the cost of the work which the Health Board will proceed to perform for him. It is well for tenants to remember this, as we happen to know of cases where many people have all but risked their lives, perhaps through inability to take the precautions themselves, and supposed inability to force their landlords to do so.

About a year ago, Dr. Stephen Smith, of the New York Health Department, published some useful suggestions relative to diphtheria which are well worth remembering. Under the heading of precautions, in addition to the removing of sources of sewer gas escape as mentioned above, he advises the removal of every kind of filth from around the house, the cleaning and white washing of dirty walls, and the disinfection of cellars and ventilation of all apartments, especially those which have been occupied by people suffering with the disease. It is well, in such rooms, not only to lime-wash the ceilings but to paint the woodwork, boil or subject to a high degree of heat every article that can be so treated, and expose the room and its contents to currents of fresh air for at least a week before reoccupation. Children that are well should not be allowed to kiss others affected with sore throat, or sleep in the same room, or use toys or other articles previously handled by the sick. It is safer to isolate ill ones from all the family, except, of course, the necessary attendants. The air in the sick room should be changed at least hourly, and all discharges from the mouth and nose should be received into vessels containing disinfectants, such as solutions of carbolic acid or sulphate of zinc, or upon cloths which are to be immediately burnt or else boiled or soaked in disinfecting fluid.

Diphtheria, like many other serious maladies, is not difficult to check if attended to in time; but it frequently baffles the highest skill if allow to run. Its distinctive feature is the formation of a false membrane in the throat, which shows itself in grayish brown patches. Sometimes the whole membrane forms suddenly; but as a rule, the patches first appear accompanied by fever and prostration. The first symptoms of the disease, sore throat and abnormal heat, are too often considered as premonitory of a simple cold; but there is no necessity of such error if parents will carefully examine the throats of their children as soon as soreness is complained of. The patches can almost always be well recognized, and a competent physician should be instantly summoned. Home-made remedies and gargles should not be depended upon; and the only treatment worth practising before the doctor arrives is to administer pounded ice, the use of which was found very effectual during the ravages of the disease in the Oneida community in this State. The prevailing dampness peculiar to the winter months may lead to increased numbers of cases of the malady. It is well therefore to keep in mind that there are but three safeguards: first, cut off the foul air; second, watch all sore throats in the family; and thirdly, summon the doctor immediately.

A VALUABLE GIFT BY CHEMISTRY TO THE WORLD.

A celebrated physician, the late Dr. Valentine Mott, used to say that iodine was the greatest gift which medicine had ever received from chemistry; and it may now be said that one of the most remarkable and important services rendered by chemical investigators to the arts and sciences is the discovery of bromine, by Balard in France, just 50 years ago. Berzelius, while describing it in his "Chemistry," mentions that no use had been found for it, but he cautiously adds the words "thus far," showing that he confidently expected that a use would ultimately be found. The discovery was fruitless in a period of 15 years, when daguerreotypy was invented; and bromine soon took an important place as one of the most valuable ingredients in the necessary materials, and now bromine compounds are indispensable to the photographer. Another 15 years elapsed; and then physicians commenced to experiment with the new element, and they soon ascertained its great value as a remedial agent, and the salts of bromine now form a series of the most important substances in the materia medica. Lately it has been found that bromine and some of its compounds are the very best etching materials for engraving metals, surpassing all acids and other agents, as described on page 369 of our current volume. But there is no reason to believe that this will close the list of the uses of this remarkable elementary substance, which is found in sufficient abundance in the waters of the sea and of many saline springs to make it comparatively cheap. A short account of the manner in which it is produced will undoubtedly interest many readers.

Bromine is commonly obtained from the mother liquor or bittern of salt works, which is rich in bromine compounds, the latter being retained in the liquor, as they do not crystallize out as easily as the chlorine compounds, of which common salt is the principal. The old method is to pass chlorine gas through the liquor, which, as the chlorine has greater affinity to the bases than bromine, sets the bromine free. The latter is then absorbed by shaking portions of the thus chlorinated liquid with ether, which dissolves out the bromine, and is darkly colored by it. Then the ether is shaken with caustic potash or soda, which combines with the bromine, and so a bromide of potassium or sodium is obtained, out of which the bromine may be set free again in the same way as chlorine is disengaged from common salt, namely, by mixing it with sulphuric acid and black oxide of manganese, and heating, when the bromine distils over.

According to an improved method, the bromine is obtained directly from the mother lye or bittern, by heating the latter with the sulphuric acid and black oxide of manganese, which decomposes the chlorides and yields chlorine gas; this in its turn sets the bromine free from the bromides, and the vapors, with that of water, pass over to a cool receiver, where they condense; while the pure bromine at last floats over a layer of saturated solution, containing 1 part bromine to 40 of water. We ought to add that pure bromine is a virulent corrosive poison. When a small piece of phosphorus is thrown on a few drops of bromine in a tall beaker glass, it is at once violently projected upward with an explosive noise, and in an ignited condition; this forms a striking lecture room experiment, illustrating the effects of very active chemical affinity.

Bromine is a very disagreeably smelling brown liquid, freezing at —8° Fah., and boiling at 150°, when it changes into a deep red vapor, nearly 6 times heavier than the air. According to Wagner's last *Jahresbericht des chemischen Technologie*, the total production of bromine at present equals 245,000 lbs., of which the United States and Germany produce the greatest part, namely, 100,000 lbs. each. Scotland produces 30,000 lbs., and France 10,000 lbs.

MAKING EXCUSES.

It has been said that a person who is good at making excuses is good for nothing else. Nature never accepts an excuse, the law seldom does, and yet in ordinary affairs of life excuses play a large and pernicious part. There are some people who spend half their time in inventing excuses for what they do in the other half of the time. What a pity this inventive power could not be directed into a useful channel, and made to benefit instead of injuring their fellow men! The habit of making excuses grows on what it feeds upon. If excuses were never accepted they would be seldom offered; but on the contrary, our whole primary school system is built on a plan that fosters the fabrication of excuses, many of which are little better than lies. There is a story of a schoolmaster who called up one of his favorite scholars and asked him why he was late. "Oh," said the little excuse maker, "I dreamt I was going to California, and when I heard the school bell I thought it was the steamboat bell." Glad to avoid punishing his favorite, this absurd excuse was accepted and the delinquent pardoned. We fear there are too many parents and teachers so willing to accept excuses that they greatly encourage excuse making, and indirectly encourage lying. As these pupils grow older and begin to feel a personal responsibility for their actions, they naturally fall into the habit of making excuses to their own consciences and of deceiving themselves. How quickly an ingenious excuse heals the prick of conscience!

We do not mean to assert that, frail and imperfect mortals as we are, we should require perfection of our fellows, nor, like Shylock, demand that the letter of the bond be fulfilled. Justice must be tempered with mercy, but sometimes we must be cruel in order to be kind. Nature's laws are inflexible; there is no escape from the severities of her just penalties. If we breathe infected air through ignorance, we suffer as much as if we had entered it with full knowledge; ignorance of the law does not relieve us from its penalties. Our statute and other laws distinguish between murder committed with premeditation and malice from that committed without forethought. The insane escape punishment for their crimes, however heinous. The man who shoots his sister by accident is at once acquitted. But does the bullet discharged by accident, or by a lunatic, or by any one in the heat of passion, prove less fatal than it would had murder been intended? The severed artery, the pierced lung, the congested brain listen to no excuses. To him that is murdered it is all one whether it was premeditated or not.

The infraction of any and all of Nature's laws brings as certain punishment as does Recorder Hackett's court, nay, more certain, if less speedy. The tight shoe, whether of satin or cowhide, worn voluntarily or involuntarily, by a city belle or a rustic clown, is sure to produce the well known corn. Undue exposure leads to consumption; over study and