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- posed road feasible and economical. 1 figure The Steam Quieter. Invention for silencing the roar of discharging steam. 12 figures
- II. TECHNOLOGY .- Notes on Strong Alkaline Developers. By H. STUART WORTLEY Action of Light on Batteries. ByH. PELLAT.
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pear, cherry, black cherry, etc. Jellies, Jams, and Preserves. How to make jelly of apple, crab apple, guince, raspberry, white currant, peach, red currant, cherry, goose-berry. General notes, etc

- III. ELECTRICITY .- The Induction Balance and Sonometer. By GEORGE M. HOPKINS. How to make this most recent and most remarkable electric apparatus. Figs. 1 to 3 The sonometer in perspective and in detail. Figs. 4 to 6. A new arrangement of Hughes' induction balance. enactive and in detail The Internal Current in a Voltaic Cell. By CONRAD W. COOKE. A
- British Association paper on a galvanometer for demonstrating the in-ternal current transmitted to the liquids within a voltaic cell. IV. CHEMISTRY.-Abstracts of Chemical Papers. Products of distilla-

Scientific American.

THE GRAIN TRADE OF NEW YORK.

son, without being amazed at the movement of breadstuffs trains of grain cars are almost constantly in sight, while on senting that amount of grain of the specified kind. On the ing from eight to fourteen thousand bushels of wheat, corn, or other grain. In single file, one of these vast tows would of cars, according to the nature of the grain.

Not unfrequently four or five ocean steamers, and a fleet warehouses along the shores, permanent or floating elevators York Central. are similarly engaged in the rapid handling of the staff of piers of the Erie and other railways.

judged from a few statistics. During the week ending September 6, the receipts at this port were: Flour, 112,124 minute, or a larger quantity of lighter grain. barrels; wheat, 2,271,492 bushels; corn, 1,327,014 bushels; bushels-about as much as was received at all the other sea-2,519,409 bushels of wheat, 914,623 bushels of corn, 2,996 ing September 10 (six days), the clearances of flour and grain week is still greater.

During the year 1878 the receipts of grain alone at this same period the export of cereals from New York amounted volume. A rough outline of it will have to answer.

As already indicated, the vast stream of life-sustaining transporting wheat from Northern Minnesota to New York -26 cents a bushel-is less than was the cost of the carriage wealth flows to us through channels of two distinct sortsby water and by rail. The inflow coastwise is too small, of wheat by lake and canal from Chicago twelve years ago. relatively speaking, to demand especial notice. The Erie **► + + +** canal, with the Hudson river on one side and the railways FORMER EXTENSION NORTHWARD OF SOUTH AMERICA. on the other-chiefly the New York Central and Hudson In his report to the Superintendent of the Coast Survey, River Railroad, the Erie road and the Pennsylvania Cendescribing the past winter's dredging operations of the Coast tral-divide the traffic about equally. And the grain received by each route has, speaking generally, its particular | Survey steamer Blake, Professor A. Agassiz shows that the treatment. That which comes by rail is graded according soundings taken, together with those previously known, make to rules agreed upon by the New York Produce Exchange, it possible to trace with tolerable accuracy the outline of the and is sold by grade, the identity of the grain being lost. The land masses which anciently united the West India Islands with the continents. After describing the geography of the grain received by water, on the contrary, is chiefly handled without grading, the identity of lots being preserved. In 100-fathom line, Prof. Agassiz says that, on examining the the latter case the consignee receives the identical grain 500-fathom line, Jamaica is found to be the northern spit of a gigantic promontory which once extended toward Hayti shipped to him, say from Buffalo or any point farther West; in the former, he receives not the grain billed to him, but a from the mainland, reaching from Costa Rica to the northcertificate for so many bushels of wheat, corn, or other ern part of the Mosquito coast, and leaving but a compara tively narrow passage between it and the 500-fathom line engrain of a specified grade, his particular shipment being, for circling Hayti, Porto Rico, and the Virgin Islands, in one economy in warehousing and handling, mixed with other gigantic island. The passage between Cuba and Jamaica receipts of the corresponding kind and grade after it has been officially inspected, graded, and weighed. The quan has a depth of 3,000 fathoms, and that between Hayti and VI. ASTRONOMY.-The Giant of the Worlds. A study of Jupiter. By tity of grain represented by each certificate is limited to Cuba is not less than 873 fathoms, the latter being probably 8,000 bushels, except for oats, for which the certificates are an arm of the Atlantic. The 500-fathom: line connects, as a gigantic island, the not to exceed 10,000 bushels each. These certificates, which hanks uniting Anguilla to St. Bartholomew, Saba Bank, the are dated and numbered consecutively, state in detail the kind, grade, and quantity of grain represented by them, and one connecting St. Eastatius to Nevis, Barbuda to Antigua, Tow. Practical plans for ameliorating the conditions of factory life. | are furnished to the consignee before noon of the same day, and from thence extends south so as to include Guadeloupe, at which time the business of the Produce Exchange begins. Marie Galante, and Dominica. This 500-fathom line thus On the floor of the Exchange all ungraded grain is sold by forms one gigantic island of the northern islands, extending sample, the various samples being exhibited on their proper | from Saba Bank to Santa Cruz, and leaving but a narrow tables, in small paper boxes duly labeled, the amount of the channel between it and the eastern end of the 500-fathom lot, and the place where it is stored or afloat, being fully set line running round Santa Cruz. As Santa Cruz is separated

down. The graded grain is represented by type samples, One cannot cross either of our river ferries, still less cir- so that dealers can see exactly what their certificates cumnavigate the city or take a few hours' sail up the Hud call for. A buyer purchases for exportation from various sellers, say, 100,000 bushels of No. 1 white winter wheat, or visible on all sides. On the Hudson River Railroad, and all any other of the dozen different grades of winter wheat. the other iron thoroughfares converging upon this city, long He handles no grain, but receives instead certificates reprethe river vast rafts of grain laden canal boats more than presentation of such certificates to the railway company or rival the railway trains in carrying capacity. It is no un- companies issuing them, freight and accrued charges being common thing for one of the large towing steamers to bring paid, the companies deliver the grain out of their general down the river fifty, sixty, or more canal boats, each carry stock of that grade, at such point in the harbor as may be designated.

A vast amount of loading is done at the elevators at 65th make a continuous line of canal boats more than a mile in street and North River. A larger amount is transferred by length; while an equivalent tonnage in cars would require floating elevators, which draw up alongside the great steamtwenty-five or thirty 40-car trains, or from six to seven miles, ers as they lie in their accustomed slips, receiving or discharging their freight. Our illustration gives a general view of an elevator of this sort, of which a fleet of twenty of other shipping, may be seen about the great railroad ele- or more are constantly employed in our harbor. There are vators at 65th street, receiving cargoes of grain and cattle, besides numerous stationary elevators belonging to large At each of the piers of the numerous European steamship grain dealing firms, at the lower end of New York island and lines, floating elevators are busy transferring grain from along the Brooklyn shore; and the Erie Railroad Company canal boats; others are at work in midstream alongside ocean ' are building at the Jersey City terminus of that road an elesteamers and sailing ships at anchor; and at the extensive vator which promises to more than rival those of the New

The speed at which grain is transferred at these elevators life, brought to their doors either in canal boats and barges, is amazing to one not familiar with their management. A or in cars floated, on boats made for the purpose, from the shaft inclosing an endless chain of buckets is thrust into a laden car or canal boat, and instantly the grain begins to The magnitude of this grain trade of New York may be travel up the long incline to be delivered on the opposite side at a rate often exceeding fifty bushels of wheat a

The report of the Produce Exchange for 1878 shows the oats, 279,355 bushels; rye, 139,886 bushels; barley, 1,100 authorized charges for handling grain at this port to be, per bushel: weighing, $\frac{1}{2}$ cent; elevating from canal boats, $\frac{1}{2}$ board ports together. During the same week the exports of cent; for delivering on board single deck ocean vessels, inbreadstuffs from New York included 113,224 barrels of flour, cluding trimming, \$7 a thousand bushels; ditto, double-decked .ocean vessels, \$8; on ocean vessels in bags, \$6.25; on coastbushels of oats, 103,701 bushels of rye. At the last date wise vessels, \$2.50. The expenses on grain to shippers by named, September 6, the amount of grain in our city gran rail from the interior are: for inspection, 25 cents a car; elearies and afloat in our harbor embraced in round numbers, vation, 1/2 cent a bushel; half weighing, 1/2 cent a bushel; 3,750,100 bushels of wheat, 3,100,000 bushels of corn, 810,000 storage, 1/4 cent a bushel. At the New York Central elevabushels of oats, 160,000 bushels of rye, and 26,000 bushels of tor the charge for bulking grain with storage (10 days) is 14 barley. The grain of all sorts in store at New York was cent a bushel. The Erie and the Pennsylvania Central Com-6,332,035 bushels. The storage capacity of the port is about panies charge, for holding grain on storage in lighters, 1/4 cent 12,000,000 bushels, but the present active demand for grain a bushel for each ten days. The charge for delivering afloat for foreign shipment, due to the general deficiency of Euro- ungraded grain in railroad lighters, including elevation from pean crops, prevents any large accumulation here. Indeed, boats, ranges from 3 cents to 11/2 cents a bushel, according the bulk of shipping devoted to the transportation of grain to the bulk of the lots handled. The authorized charge for from this to foreign ports is at this season something unpre- towing laden canal boats about the harbor ranges from \$5 to cedented in the history of the world. During the week end- \$11, according to distance. The freight tariff from the great grain distributing point of the West, Chicago, varies with the for Europe alone embraced eighty-five vessels (45 barks, 30 season, the style of carriage, the degree of competition steamships, 4 ships, 5 brigs, 1 schooner), carrying a grand between the railways, or between water and rail carriage. total of 78,112 barrels of flour, 1,942,248 bushels of wheat, In the winter, when the lakes, the Erie canal, and the Hudand 1,249,092 bushels of corn. The promise for the current son River are closed, the rate rises as high as 25 cents a bushel. On the opening of the water routes the rates fall, dropping at midsummer as low as 8 or 9 cents by rail and 6 port were, by canal; 63,663,049 bushels; by vessels coast- cents by water. The average rate by water during 1878 was wise, 1,090,236 bushels; by rail, 63,960,486 bushels-a total 714 cents; by all rail routes, 12 cents. As an important link of 128,613,771 bushels. Changing flour and meal to their in the water route, the Erie canal is of infinite importance. equivalents in bushels, the receipts of grain, flour, and meal The existing railways alone would be incompetent to do were, during the year, 152,862,170 bushels. During the the carrying required at the time required (assuming the foreign demand unimpaired); besides, by having the monoto 107,819,044 bushels, the exports from all the other Atlan- poly, their rates would not only be made higher than now tic ports together (including Montreal) being 104,678,187 obtains, but possibly so high as either to destroy the possibushels-evidence enough that our city still holds the lion's bility of our competing in price with Russian wheat in Livershare of this trade. To describe in detail the manner in pool, or to make competition possible only at the sacrifice of which the grain trade is conducted here would require a all profit to our wheat growers. It is worth noting in this connection that during the present year the average cost of

tion of alcohol. A new alkaloid. Composition of wood. Phosphor. escence of lobsters' flesh

Note on Characine. ByD. T. L. PHIPSON. A new and peculiar organic substance found in fresh water alga

The Bleaching of Sugar Sirups by Ozone. By ALBERT R. LEEDS Effect of ozone on filtered syrup.

- V. NATURAL HISTORY. ETC.-Some Curious Exotic Insects. Fig.1. Schizodactylus monstruosus. Fig. 2. Bradypora cloporta. Fig. 3. Myg-nimia aricula. Fig. 4. Atta barbarica (worker). Fig. 5. Æeodoma-cephalotes (worker). Fig. 6. Pachylis gigantea. Fig. 7. Catocantha incarnata. Fig. 8. Bell bearing bocylia (enlarged). Prehistoric Man in Germany Recent cave discoveries in Moravia. An Open Polar Sea
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