APPLIED SCIENCE.

NEW METHOD FOR TESTING THE QUALITY OF IRON.—Van Ruth, the Inspector of Mines of Holland, examines the structure of iron by smoothing the surface at the desired point, and then treating it from 6 to 24 hours, according to temperature, &c., with hydrochloric acid, until the slaggy portions, which are more readily affected than the iron, are dissolved out and the fibers are left in relief, so that an impression may be taken from the surface with printers' ink, India ink, &c., which will exhibit the structure clearly, and serve for distinguishing and comparing the iron.

PROCESS FOR BLEACHING RAPE, POPPY, AND LINSEED OILS.—Puscher states that by mixing 220 pounds of these oils intimately with 44 pounds of a mixture containing equal parts, by weight, of 96 per cent alcohol, and oil of vitriol, they do not become partially resinous, as when oil of vitriol alone is used, but the sulphethylic acid mixes perfectly uniformly with them. The green turbidity that soon appears after a while becomes black, and, after standing 24 to 48 hours, forms a slight black sediment. Poppy and rape oils become perfectly clear; linseed oil in thick layers retains a trace of yellow. The oils, after being drawn off from the sediment, must be thoroughly shaken with several quarts of hot water, to free them from traces of sulphuric acid, and then be allowed to settle.

INERASIBLE WRITING INK AND BLACK ANILINE VARNISH.—An ink that is not affected by strong mineral acids nor alkalies, and at the same time will not corrode steel pens, may be made by triturating 50 grains of aniline black with a mixture of 60 drops of concentrated hydrochloric acid and 300 grains of alcohol, and diluting the deep blue solution obtained with a hot solution of 90 grains of gum-arabic in 1,400 grains of water.

A very deep black varnish for wood stained black, brass, or leather, can be prepared by using a solution of 315 grains of shellac in 1,440 grains of alcohol, instead of the solution of gum-arabic, to dilute the above-mentioned aniline-black solution.

EFFECT OF DIFFERENT MANURES ON THE PRODUCTION OF OPIUM.—Experiments, by Dr. Dietrich, gave the following results. The blue German poppy not only yields the largest amount of opium, but also that richest in morphine. Opium from unmanured land contains less than one-half per cent of morphine; that from land manured with saltpeter had three to four times this amount; while that from land manured with sulphate of ammonia contained 15 times as much. The application of potash and phosphoric acid, alone or mixed, did not essentially increase the amount of morphine. He concludes, therefore, that the ammonia of the atmosphere does not afford sufficient nitrogen for the formation of vegetable products rich in that element; that nitrogenous fertilizers are of the highest importance for this purpose; and that the presence of nitrogen in the manure, as an ammonia compound, is more favorable to the formation of morphine than as a nitrate.

DETECTION OF ADULTERATIONS OF MADDER.—A simple method, quoted from Pernod, is given in *Iron*, for detecting the more probable adulterations of madder. These he divides into two classes; those which give colored compounds with oxide of tin, &c., such as logwood, peachwood, barwood, &c., and those which contain tannin, with little or no coloring matter, such as oak bark, extract of chestnut, &c. These latter substances produce a black or brown color with solutions of iron. To detect adulterations of the first class, take a piece of white paper of four inches square, dip it into a solution of tin crystals, lay it on a white earthenware plate, and sprinkle a little of the finely-powdered sample upon it. If logwood be present, purple spots will appear in about half an hour. Peach and barwood will be betrayed by red spots, and fustic by yellow; while pure madder gives merely a faint yellow color. A piece of paper similarly steeped in sulphate of iron will serve for the detection of the second class of impurities, every particle of which will be indicated by a fine black spot. An adulteration amounting only to one part in a thousand parts of madder may thus be detected.

PRESERVATION OF FOOD BY COLD.—A hint at what may possibly become an important method of preserving animal and vegetable substances for an indefinite length of time, without subjecting them, as at present, to the action of heat, and thereby materially affecting their texture and taste, is furnished by Boussingault to the Academy of Sciences of Paris. In a recent communication to that body, he states that, as long ago as 1865, he exposed beef bouillon in hermetically sealed vessels to the action of a freezing mixture at a temperature of 4° F., keeping the same immersed in the mixture for several hours. On opening these vessels, quite lately, he found that the contents had undergone no change, and were precisely as before being submitted to the cold.

The juice of sugar cane, exposed in a closed vessel to a similar degree of cold, was also preserved from any alteration. Boussingault refers in his article to the fact, well known to geologists, that a low temperature, continued for ages, prevents the decomposition of muscular fiber, instancing the fact of the discovery in 1808, at the mouth of the Lena River in Siberia of an elephant buried in the ice which was so well preserved as to serve as food for the dogs of the native tribes.

"SUBSTITUTE FOR MILK FOR CALVES.—An article of food for calves, suggested by Liebig, analogous to his substitute for milk for children, has been thoroughly tested by Von Rothenhan, with the most favorable results. Its cost is about half that of milk, it is easier to prepare than other substitutes for milk of inferior character, and which are not as eagerly taken by the calf, and it never produces diarrhea or other injurious consequences. For the latter reason it is also especially adapted to young pigs. It may be prepared as follows: 1 quart of water, 1 quart of skimmed milk, 1,130 grains of bruised malt, 1,130 grains of wheat flour, and 90 to 100 drops of a solution of bicarbonate of potash in 11 parts of water are stirred together, allowed to stand for half an hour, then well boiled with stirring, and finally filtered through gauze to remove undissolved flour, &c., which might cause flatulence, &c. It will keep 24 hours, and must be prepared daily, and given warm. For the first six weeks all the milk is given the calf, then the mixture is gradually substituted for a portion of the milk, until eight quarts of the mixture and no milk are given per day. As much clover and white hay as it will eat are supplied at the same time. After three months only half as much of the mixture is fed, with the addition, however, of about half a pound of oil-cake, and, in the Fall, of boiled potatoes also. It may likewise be given to calves at first, when milk does not agree with them.

EFFECT OF TIME OF SEEDING ON GRAIN.—Prof. Thiel of the Agricultural School of Darmstadt, while attributing the failure of development of much of the seed sown in great part to defective seeds, to the variable depths at which they are deposited when a drill is not used, and to the numerous injurious insects, suggests that the effect of unfavorable weather, in addition to all other causes, especially with Winter grain, may cause the destruction of a great number of plants already developed, and that, consequently, a most important point to be determined, in connection with certainty of crops, is the proper time for seeding. In order to substantiate this opinion experimentally, portions of ground were seeded with rye and wheat, at intervals of eight days, from Dec. 14 to Nov. 27, when heavy frost prevented further seeding. The number of fully developed stalks was compared with the number of seeds that germinated, as well as with the whole number planted. The differences in development were estimated by the number of stalks and heads, and the length of the stalks; the number of grains, according to the author's view, in small patches, not affording a proper criterion for comparison, even if the ravages of the birds did not render their complete determination impossible. In the tabular statement given the numbers are in all respects favorable to the three early seedings. In spite of the differences in time of seeding, there was a difference of only a few days in the shooting of the stalk, and in blossoming, so that the grain ripened about the same time; and in these facts may lie the poorer yield of the late seeding, even of the plants that reached maturity. These began to shoot under the influence of favorable weather in the Spring, without having had time to assimilate sufficient nutriment for vigorous development. The author does not contend that a difference of eight days in seeding time, at the right season, would necessarily have a decided effect, but that other influences, such as peculiarities of soil, character of preceding crops, &c., may be greater; and again he admits that the weather in the beginning of November may at times perhaps be less favorable to newly sown seed than in the middle of the month; but he claims, that circumstances of this kind do not affect the general statement (as substantiated by his experiments) namely, that sowing seed at the proper time, i. e., early in the season, insures greater certainty of germination and development, more vigorous and healthy plants, fuller growth, larger number of stalks and heads and longer straw.

INDUSTRIAL PROGRESS.

The Tecumseh Iron Company of Cherokee County, Ala., was recently organized under favorable circumstances. It has a subscribed capital of $100,000, with many leading citizens of Alabama and Georgia as stockholders. It augurs well for its success, also, that it has Gen. Willard Warner as President and manager.

The works of the Nes Silicon Steel Company in Sandusky, Ohio, are approaching completion. The company propose to make steel rails and superior qualities of iron by a new patented process. The President is E. Gulick, and the Vice-Presidents are Messrs. Alonzo B. Cornell, E. P. Wheeler, and William Halsey.

The straits to which English manufacturers are reduced for cheap coal compels a leading technical paper to observe that "the day is probably not very far off when it will become matter for full consideration how England may best and most economically draw upon the immense coal seams of Picton and Cumberland River in Nova Scotia."

Birmingham, Eng., advices of the 27th ult. state that "several steel manufacturers, partly owing to brisk demand, and partly on account of the increased cost of fuel and raw materials, have found it advisable to raise prices 10 per cent. The American and continental markets show no falling off, on the contrary, an increasing quantity is being shipped from Liverpool weekly.

It is a pleasing indication of the drift of public opinion that in a recent election contest in Sandusky, Ohio, it was regarded as the best claim of a candidate that he had subscribed $5,000 to establish steel works, aided the railroad and coal interests of the place, and insured the building of a blast furnace in the city. This is better than a long recital of "party" services.

Cotton mills, a Memphis paper observes, pay well in the South. It gives the balance sheet of one in that city which runs 100 looms and 3,024 spindles, and realized last year $30,353, equivalent to 25 per cent on the capital stock. A mill in Augusta, it is also said, running 500 looms, paid two years ago a dividend of 20 per cent. "The nearer," it aptly remarks, "the cotton mills are to the cotton fields the greater are the profits."

St. Louis aspires to have cotton factories. A local journal says: "We shall have no permanent trade in cotton until we set thousands of spindles to work manufacturing cotton goods. The completion of the bridge over the Missouri will insure a constant supply of cheap fuel, thus giving us a motive power at a cost little more than that of water power in the East, while our manufacturers will find a ready market right at their doors."

Joining in the general desire to encourage and foster manufactures in the South, *The Savannah Republican* observes that some cotton mills in Georgia pay 30 per cent on the capital invested therein; that the facilities for obtaining water power are abundant, while plenty of raw material is at hand, and labor is comparatively cheap. The same journal approves of the act of the Legislature exempting from taxation the capital (from other States) invested in the Arkwright factory.

According to the census returns, which show a wonderful increase in the value and diversity of the manufactured products of the entire country, the 11 States whose manufactured products exceed $100,000,000 annually, were as follows:

States.	Annual Products.	States.	Annual Products.
New-York	$765,194,651	New-Jersey	$159,257,732
Pennsylvania	711,894,344	Connecticut	161,065,474
Massachusetts	553,912,568	Michigan	118,394,076
Ohio	269,713,610	Rhode Island	111,418,354
Missouri	206,213,629	Indiana	108,617,278
Illinois	205,520,672		

NOTES ON EDUCATION.

Col. E. B. Morgan of Aurora proposes to give the Auburn (N. Y.) Presbyterian Theological Seminary grounds, buildings, and money, to the amount of $500,000. All this on condition, however, that the institution is removed to Aurora.

An editor of Columbus, Ohio, is graciously gratified, and says so enthusiastically, by the charming costume of the young ladies at some public performances at the High School, lately. The Senior Class was dressed in modest calico.

Harvard is having a course of Sunday evening sermons which is to continue through May and June. In the list of clergymen are the names of the Rev. Phillips Brooks, Alexander McKenzie, John F. W. Ware, H. W. Bellows, Edward E. Hale, and A. P. Peabody.

There is a complaint at the South that many of her young men are not now educated in this country, but abroad, whence they return with good manners, a little smattering of Latin and French, a little music, a few poor drawings, and a good knowledge of wines. They also bring back a contempt for republicanism, and no religion to speak of. This is all wrong, if it be true.

The English National Union for Improving the Education of Women has offered seven scholarships of £125, tenable for one year, for competition throughout the United Kingdom—the competitors to be young women over sixteen years old. These scholarships are to be awarded by the Universities of Oxford, Cambridge, and Edinburgh, Trinity College, Dublin; the Science and Art Department, Society of Arts, and College of Preceptors, London, at their examinations this year.

Archbishop Manning, in appealing to the Catholic clergy to use all their influence for religious education at the next general election, says that no Catholics can take degrees in England "without exposure to the pestilential infidelity of Oxford or London University, where ethics and metaphysics are taught in such a way that young Catholics, though they may see the falsity of the conclusions, are perplexed and confused, and cannot find answers."

Another building is to be added to the Indiana State University. It will be useful above anything else for the accommodation and exhibition of Dr. David Dale Owen's very valuable collections in mineralogy, geology, and zoology. The second floor will be used for the library of the institution. This already numbers 7,000 volumes, and $2,500 is expended upon it every year. The attendance during the present year has been greater than at any previous time in the history of the University. The establishment of two additional chairs in the Literary Department is contemplated.

The California University is as lucky as it is deserving. Gifts are pouring upon it in an avalanche. There is the Tompkins $50,000 Oriental Professorship; there are the Toland Medical College property, Mr. Reese's gift of Dr. Lieber's library, and his intended purchase—a large and valuable library for the University in Europe. Large and well arranged cabinets of mineralogy, geology, and archæology, have just been presented; also a quartz battery and ten acres of land adjoining the University. Several gentlemen have lately made gifts in money.

The Massachusetts Association of Classical and High School Teachers recently discussed the question of single or double sessions in high schools, and voted by a good majority that the single session was preferable. The chief argument used was that all great scholars and literary men did all their work for the day before dinner. The Association also talked about the expediency of enlarging the range of the requirements for admission to college. President Eliot of Harvard was present, and said that if Harvard should adopt this higher standard she would have to do it alone, for hers was already as high as any of the other colleges would agree to. He thought that the six years of the students could be utilized better than at present, but they would have to go below the high schools to effect the change.

In Boston they are urging the matter of instruction in sewing in the public schools. The Chairman of the Committee on Industrial Schools has presented to the School Committee a report upon the question, which has not been acted upon, but which has attracted great public interest. It includes the following proposed orders:

1. *Ordered*, That, on and after September next, sewing now taught in the sixth, fifth, and fourth classes of the girls' grammar schools, be gradually introduced into the three other classes in said schools; the present fourth class and its successors, as it advances from the fourth to the third, and from the third to the second, and from the second to the first class, to continue to receive instruction in sewing, so that in three years from this time it may be universally taught in all the classes of the girls' grammar schools, and more thorough and progressive instruction given.

2. *Ordered*, That, whenever the gradual progress of this plan permits, practical instruction in cutting, shaping, fitting, and thoroughly making children's and ladies' garments shall be given to the members of the first and second classes of the girls' grammar schools; and that in preparation for it, the District Committee of each girls' school shall be authorized to procure and nominate to this Board a sewing teacher, thoroughly competent to give the aforesaid instruction, and, giving her whole time to the city, to take supervision and charge of the whole department of sewing in the school; her salary to be subsequently determined by this Board, but never to exceed the highest salary paid to any female assistant in said schools.

3. *Ordered*, That, when the gradual progress of this plan makes it necessary, the Committee on Accounts be authorized to furnish, on the requisition of each district committee, all the materials necessary to give the contemplated instruction in cutting and making garments, to an extent not exceeding $200 to each school, and not exceeding $50 to any one room.

4. *Ordered*, That each district committee be authorized, if at any time they shall deem it expedient, to select and associate with them one or more competent ladies from their district, to aid them in superintending or carrying out this plan of thorough instruction in sewing.

New Publications.

IN THE SCIENCE OF HEALTH for May we have "Health against Fashion;" "Diet of a Nursing Mother;" "Seasonable Dishes;" "Teeth of Different Nations;" "Popular Physiology;" "Flatulence and Heart-burn;" "Health of Mechanics;" "American versus Chinese Medicine." Answers to correspondents, &c., make up a good number of this excellent Magazine, which is only $2 a year. Sent on trial three months for 25 cents. S. R. WELLS, 389 Broadway, N. Y.

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WATERS'S CONCERTO PARLOR ORGANS are the most beautiful in style and perfect in tone ever made, and will wear a lifetime. The Concerto stop is the best ever placed in any organ. It is produced by a third set of reeds peculiarly voiced, the effect of which is most charming and soul-stirring, while its imitation of the human voice is superb. Prices low for cash, or part cash, and balance in monthly or quarterly payments. Other Organs from $50, upwards. Organs to let, that may be purchased. Illustrated Catalogues mailed. Warerooms, 481 Broadway, N. Y. HORACE WATERS & SON.

A GREAT OFFER FOR APRIL!!
Horace Waters & Son, 481 B'way, N. Y.,
will dispose of 100 PIANOS, MELODEONS, and ORGANS of first-class makers including Waters's, at EXTREMELY LOW PRICES FOR CASH, during THIS MONTH. New 7-octave PIANOS, modern improvements, for $220 and $275, cash. THE WATERS CONCERTO PARLOR ORGANS are the most beautiful in style and perfect in tone ever made. Prices at bargains, for cash. Monthly installments received, running from one to three years. New and second-hand instruments to let, and rent applied if purchased. Illustrated Catalogues mailed.

Notices of Bankruptcy.

FOR SALE.

EAST ALABAMA AND CINCINNATI RAILROAD.
In the District Court of the United States for the Middle District of Alabama—In Bankruptcy. In the matter of the East Alabama and Cincinnati Railroad Company, a bankrupt.
Pursuant to the order of the said Court, made on the 8th day of April, A. D. 1873, the undersigned, assignees in bankruptcy of the East Alabama and Cincinnati Railroad Company, hereby give notice that they will expose for sale for cash, at public auction, at the Artesian Basin, in the City of Montgomery, Alabama, at 12 o'clock, meridian,
ON THURSDAY, THE FIRST DAY OF MAY, A. D., 1873,
all the continuous railroad of said company, from its terminus at Hafrula, in the State of Alabama, to its terminus at Guntersville in the State of Alabama, together with its franchises, equipments, rolling-stock, machine-shops, depots, water stations, road beds, machinery, tools, easements, and every other right, interest, or estate whatsoever, which was conveyed by said East Alabama and Cincinnati Railroad Company by its mortgage or deed of trust executed on the first day of July, A. D., 1870, to Henry Farnam and William H. Barnes, subject, however, to the lien of the State of Alabama on the instruments of the first mortgage bonds of said Railroad Company, and to the lien of the holders and owners of the first mortgage bonds so indorsed by the State of Alabama, to the amount of four hundred thousand dollars, and subject to the further lien of the holders and owners of the first mortgage bonds of said Railroad Company unindorsed by the State of Alabama, to the amount of three hundred and five thousand dollars.
SAMUEL G. JONES,
JOHN F. BAILEY,
Assignees in Bankruptcy of the East Alabama and Cincinnati Railroad Company, Bankrupt.—Dated Montgomery, Alabama, April 8, 1873.

IN the matter of the Estate of BOWLES BROS. & Co. in Bankruptcy.—The list of creditors filed in said case being incomplete, all creditors who have not been represented in Court are requested to communicate immediately with the assignee in Boston, and state their address and the nature and amount of their claims, in order that the full amount of indebtedness may be ascertained as early as possible.
HENRY J. STEVENS, Assignee, 19 Court-st., Boston.
New-York creditors can learn the necessary facts by applying to SANFORD, ROBINSON & WOODRUFF, Counselors-at-Law, 160 Broadway, New-York City.

Marble and Slate Mantels.

A. KLABER, Steam MARBLE and MARBLE-IZING WORKS, 156 and 158 East Eighteenth-st. Marble and Marbleized Mantels, Tiling, Marble Counters, Monuments, at prices that defy competition. Marble turning for the trade.

STEWART'S SLATE MANTELS—Rich and elegant designs. Slate work of every description. MARBLE and WOOD MANTELS. T. F. STEWART & Co., 220 and 222 West Twenty-third-st., near Seventh-ave.

THE PENRHYN SLATE Co. have removed to their new warerooms, Union-square, Fourth-ave., and Seventeenth-st., and are offering a large assortment of MANTELS, GRATES, &c., combining many elegant and unique designs, at prices challenging competition.

To Whom it may Concern

FISH COMMISSION.—The Annual Report of the New-York Fishery Commissioners is ready, and will be sent to any one without charge on application to ROBERT B. ROOSEVELT, 160 Broadway.
ROMAYNE SEYMOUR,
EDWARD M. SMITH,
ROBERT B. ROOSEVELT,
Commissioners.

London Advertisements.

YORKSHIRE RELISH.
The Most Delicious and Cheapest Sauce in the World.
Warranted pure and free from any injurious ingredient.
672,192 BOTTLES SOLD IN ONE MONTH (AUGUST, 1872).
Sale unprecedented in the history of Sauces.
Sold by Grocers, Druggists, and Oilmen, in bottles, at 6d., 1s., and 2s.
Trade Mark—Willow Pattern Plate. Beware of Imitations.
Manufacturers: GOODALL, BACKHOUSE & CO., Leeds, England.

Goodall's Quinine Wine

The BEST and MOST AGREEABLE TONIC yet introduced. For the relief of Indigestion, General Debility, and Loss of Appetite it is invaluable. Recommended for its purity by the Food Journal. Arthur Hill Hassall, M. D., Wentworth L. Scott, esq., F. C. S., F. A. S. L., F. R. S. S. A., &c. Sold by Grocers, Oilmen, and Chemists, in large bottles, at 2s. each. Beware of imitations. Prepared by GOODALL, BACKHOUSE & Co., Leeds, England.

Corporation Notices.

CORPORATION SALE OF REAL ESTATE and LEASES OF FERRY FRANCHISES.
Public notice is hereby given that the Commissioner of the Sinking Fund of the City of New-York will offer for sale at Public Auction, on TUESDAY, APRIL 29, 1873, at noon, at the Exchange Salesroom, No. 111 Broadway, in the City of New-York, the following Real Estate belonging to the Corporation of the City of New-York:
Premises known as No. 160 Wooster-st.
Premises known as No. 252 West Thirty-fifth-st.
Premises known as No. 53 Spring-st.
Premises known as No. 49 Leonard-st.
Building and land on the east side of Avenue C, between Sixteenth and Seventeenth-sts., known as the Eighteenth Ward Market.
Full warrantee deeds will be given to all purchasers. Lithographic maps of the above real estate may be obtained at the Comptroller's Office on and after the 10th of April next.
ALSO,
SEALED BIDS will be received, to be publicly opened at the Comptroller's Office on APRIL 29, 1873, at 3 o'clock p. m., for leases for a term of 19 years from May 1, 1873, of the following Ferries and Ferry Franchises:
Ferry now established from foot of Houston-st., E. R., New-York, to foot of Grand-st., Brooklyn, E. D.
Ferry now established from foot of Grand-st., New-York, to foot of Grand-st., Brooklyn, E. D.
Ferry now established from foot of Ninety-second-st., E. R., to Astoria, Long Island.
Lease of Ferry Franchise now established from foot of Barclay-st., N. R., to Hoboken, New-Jersey.
Lease of Ferry Franchise now established from foot of Desbrosses-st., N. R., to foot of Hamilton-st., New-Jersey.
The leases to be made to conform to the requirements of laws relative to Ferries and such regulations, ordinances, or by-laws as are now, or hereafter may from time to time be made or passed by the Common Council or State Legislature.
Bids to be addressed to the undersigned and indorsed "Bids for Ferry Franchises."
The right to reject any bid if deemed to be to the interest of the City of New-York is reserved by the Commissioners of the Sinking Fund.
ANDREW H. GREEN,
Comptroller.
Comptroller's Office, New County Court-House, March 27, 1873.

ORDINANCES APPLICABLE TO THE ORDINARY USE OF THE CENTRAL PARK.—The Board of Commissioners of the Department of Public Parks, this 31st day of March, A. D. 1873, adopt and ordain the following ordinances for the use of the Central Park, to be observed by all persons not in the service of the Department:
I. No one shall enter or leave the Park except at the established entrance ways, nor shall any one enter or remain in it after 11 o'clock at night, during the six months beginning May 1; nor after 9 o'clock at night during the six months beginning Nov. 1, except as, on special occasions, its general use may be authorized beyond the regular hours.
II. No one shall climb upon or in any way cut, break, injure, or deface any wall, fence, shelter, seat, statue or other erection, nor any turf, tree, shrub, or other plant, nor throw stones or other missiles, nor discharge fire or carry any fire-arm, fire-cracker, torpedo or fireworks, nor make a fire, nor play any musical instrument, nor offer or expose things for sale, nor post or display any sign, placard, flag, banner, target, transparency, advertisement or device of business, nor solicit business or hire, nor beg or publicly solicit subscriptions or contributions, nor tell fortunes, nor play games of chance or with any table or instruments