CARDS.

G. TRAUGH, ATTORNEY AT LAW, Tremont, Schuylkill County, Pa.
Tremont, April 29, 1851. 17-tf.

JOHN HUGHES, ATTORNEY AT LAW, Pottsville, Schuylkill county, Pa. Office in Centre street opposite the Miners' Bank.
April 27, 1851 1y-39*

WILLIAM L. WHITNEY, ATTORNEY at Law, Pottsville, Schuylkill county, Pa. Office Centre street, nearly opposite the Miners' Bank.
Jan. 4, 1851 1-1y

M. WILSON, MAGISTRATE, CONVEYancer, Land Agent and General Collector.—Office, Market street, Pottsville, Pa.
Nov. 30, 1850. 48-1y

H. SAMUEL HERLUCHY, OFFICE, corner 4th and Mahantango streets, Pottsville—(the late ly occupied by Dr. Thos. Brady.)
Pottsville, March 15, 1851 11-tf

DOCTOR C. HÆSELER, HOMŒOPATHIC PHYSICIAN, Removed his Office to one of the new Houses in Coal Street, Pottsville.
April 26, 1849. 18-tf

JAMES H. GRAEFF, ATTORNEY AT LAW, having removed to Pottsville, has opened an office in the Telegraph Office, Centre street, opposite the Miners' Bank.
Office: 1851. 49-1y

SAMUEL HARTZ—JUSTICE OF THE PEACE, Pottsville. Will attend promptly to Collections, Leases, Purchase and Sale of Real Estate, &c., in Schuylkill County, Pa. Office in Centre street, opposite the Town Hall. Oct 20, 1849.

JOHN WILLIAMSON & JAS. COOPER, Counsellors at Law, Pottsville. Office, in Centre St., a few doors East of the "Pennsylvania Hall." Mr. Cooper will attend at all the Courts.
Pottsville, Dec. 7, 1850 49-3m

EDWARD SHIPPEN, ATTORNEY AND COUNSELLOR at Law, Philadelphia, will attend to Collections and all other legal business in the City of Philadelphia, adjoining Counties and elsewhere.—No. 173 Walnut street above Seventh street, Philadelphia.

P. SHERWIN, EXCHANGE AND COLLECTING Office, Pottsville, Pa.—Dealer in uncurrent Bank Notes, Bills of Exchange, Certificates of Deposit, Checks and Drafts. Checks for sale on Philadelphia and New York, in sums to suit.
March 9, 1850. 10-1

JOHN BANNAN, ATTORNEY AT LAW, has opened an office in Centre street, Pottsville, opposite the Episcopal Church, where he will be daily, during business hours, to attend to business letters to him will receive prompt attention, addressed to him at either Pottsville or Orwigsburg.
June 6, 1851. 49-tf

AGENCY—For the purchase and sale of Real Estate, Buying and selling Coal; taking charge of Coal Lands; Mines, &c., and collecting rents—from many years experience in the County he hopes to give satisfaction. Office Mahantango street, Pottsville.
March 6, 1850 CHAS. M. HILL.

PURVES, DEALER IN SCRAP IRON Copper, Brass, Bar and Block Tin, Soldering Lead, &c. Orders received for Brass and Iron work, and Machine furnishing. All orders connected with the above line promptly attended to. South Street, above Front, Philadelphia.
June 15, 1850 24-tf

PUBLICATIONS, &c.

LEASON'S PICTORIAL DRAWING ROOM Companion, with illuminated title, beatly bound in Binders of the Subscriber. Also, all kinds of Binding.
B. BANNAN.

FAMILY BIBLES.—60 Quarto Family Bibles, varying in prices from $1 to $20. Also Pocket Bibles, gilt edge, as low as 37½ cents each. Just received and for sale at
B. BANNAN'S
Cheap Book Store.
July 21, 1852. 17—

DICK'S WORKS—complete edition: A few copies of these justly celebrated works, just received and for sale at only $2. Also,
Smith's Animated Nature, 4 volumes bound in 2, at $3 plates, only $3 75.
For Sale Boat, a splendidly illustrated work, only just received and for sale by
B. BANNAN.
Dec. 27, 1852. 16—

CLARK'S COMMENTARY, ONLY $11.—The Subscriber has just received Clark's Commentary, small print, 4 Volumes octavo, at the low rate of a rare opportunity, for those who desire this invaluable work, to procure a copy.
B. BANNAN.
Also, Comprehensive Commentary, 6 vols—$10 50
Brown, Lowthe, &c., Commentary, 4 vols.—$6 50
April 17, 1852. 16—

A NEW and beautiful Map of the United States—exhibiting its works of internal communication, across the Continent, &c., &c., showing also Texas and the Island of Cuba—for schools and private instruction—just published—for sale by
B. BANNAN.
Dec. 5, 1852. 14—

THE MODEL ARCHITECT, containing original designs for Cottages, Villas, Suburban Residences, &c., accompanied by explanations, specifications, estimates and elaborate details, prepared expressly for the use of Proprietors and Artizans throughout the United States, by Samuel Sloan, Architect.—Published in numbers, and for sale by
B. BANNAN.
A copy of this work ought to be in the hands of every Architect and Builder in the country.
Dec. 6, 1852. 10—

MISCELLANEOUS.

SUPERIOR FIRE BRICK.—Constantly on hand and for sale, the following description of Fire Brick, viz:—
Straight Shape, Large wedge, Small wedge, Soap Split head, Arch and Jam, together with any extraordinary size furnished at short notice.
E. YARDLEY & SON.
March 13, 1852. 11-tf

PORT MONNIAS VERY CHEAP.—Twelve dozen Port Monias, assorted kinds, some as low as 8c., retail and wholesale, at prices a little less than have ever been sold before. Dealers supplied on better terms than they can purchase in Philadelphia, and satisfy yourselves. Elegant Port Monias, cheap, at retail.
B BANNAN.
July 3, 1851. 7—

RACING CLOTH.—A capital article for Entries and Map Covers, by the Roll or yard, just received and for sale by
B. BANNAN.
Also, Drawing Paper of any sized sheets, handbacked with Muslin. Drawing Paper of every description.
Dec. 27, 1852. 16—

DR. CANNON'S Adhesive Cement, for mending China, Glass, Earthen, Stone and Queens-ware, Alabaster, Porcelain, and can be used for glass. This is a good article—no humbug—has been tried; and can recommend it. For sale, wholesale and retail, by
B. BANNAN.
Also, Parker's Furniture Gloss, both capital articles for Housekeepers at moving and house-cleaning season.

THE POULTRY BREEDERS TEXT BOOK comprising full information respecting the choice breeds of Poultry and the mode of raising them successfully. Price 12½ cents. Just received and for sale at
B. BANNAN'S
Cheap Book and Publishing House
Also a capital book for Pedlars, who will be supplied cheap to the 100 copies.

HARRISON'S INKS.—The subscriber has made arrangements always to keep a supply of the celebrated Inks on hand, and will sell it wholesale to dealers, at the Manufacturer's prices—thus saving the carriage. He also retails it in gallon, half gallon, quart, or smaller bottles, at city prices.
B. BANNAN.

PAINTED WIRE GAUZE.—Various figures for Office Window Screens, just received and for sale at city prices at
Cheap Curtain and Variety Store.

NEW MUSIC.

NEW MUSIC.—LEE & WALKER, successors to George Willing, No. 1 Chestnut street, under the Girard House, have just published the following New Ballads, Polkas &c.
Where you Speak, by N. J. Sporle.
Secret, by the author of "Will you have me my own."
Kate, as sung by Mr. Hudson, Music by Dr. Rimbault.
Star bright Flag of Columbia," adapted to the Air of "Ever be Happy," in Opera "Enchantress."
Tom art gone, by the late "J. T. S Sullivan."
Queen Love, " " "
Kate's Love, " " "
Tis an that love can never forget, by M. Keller.
Fairest Bride, by J. A. Getze.
Serenade do, by M. Keller.
Polka do, as performed at Cape May, by John Ball.
The Brilliant, from the Opera of the Four Sons of Aymon, by T. C. Warwick.
Musical Amusements, Elegancies, by Charles Voss.
They have the pleasure to announce to the public that their stock of Sheet Music consists of the largest and most complete assortment to be found in the city, they are constantly adding to their stock all the New Music published in New York, Boston, &c.
PIANOS.
A large assortment of the best manufacturers of New York and Boston, at the lowest cheap prices.
MUSICAL INSTRUMENTS
A general assortment of Guitars, Violins, Banjoes, Accordeons, &c., Violin, Guitar and Harp Strings of the best Italian qualities, all of which will be sold to the public and the trade at the lowest rates punctually attended to.
Dec. 13, 1851. 2—tf

SLEIGHMAN'S Cheap Cutlery STORE No. 33, 34, 35, 36, and 37 Arcade, Philada.
COUNTRY Merchants can save from 10 to 15 per cent by purchasing at the above stores. By immediate cash purchases, they can sell their own Goods, paying but little rent, and live economically, it is plain I can undersell those who have their goods here, pay high rents, and live in style.
Constantly on hand, a large assortment of Pen and Pocket Knives, Scissors and Razors, Table-Knives and Forks in ivory, stag, buffalo, bone and wood handles, Carvers and Forks, Steels, &c., Butchers' Knives, Bowie Knives, Revolving and plain Pistols, &c.
Also received, a large stock of Rodgers', and Wostenholm's best Pen and Congress Knives.
Also a large assortment of Accordeons, &c., &c.—Also, the best English Twist and German Guns.
JOHN M. COLEMAN, Importer.
Dec. 13, 1851. 52-tf

COACH MAKER'S REMOVAL.
THE SUBSCRIBER HAVING FITted up one of the largest Coach Shops in the State, in Coal Street, Pottsville, (a few doors East of Mr. Adams & Co.'s Screen Factory,) where his facilities for manufacturing all kinds of Carriages and Light Waggons cannot be surpassed, being a practical Mechanic, and having a good years' experience in the business, he hopes by strict attention to business, to receive a liberal share of public patronage.
Also on hand Carriages and Light Waggons kept on commission.
Also second-hand Waggons, &c.
Repairing neatly done. Orders from a distance promptly attended to.
CHRISTIAN A. KIRK.
Dec. 5, 1849 23-tf

N M NEWNAM'S
Fifty Row, Norwegian street, Pottsville, Penna.,
Plumbing Shop.
IS CONSTANTLY ON HAND A SUPPLY OF Sheet Lead, Pipe, Sheet Lead, Block Tin, Lead Tube, Shower Baths, Hydrants, Hose, Double Acting Force and Water Closets; also, all kinds of Brass Cocks for water and steam, Brass Oil and Globe Valves for Engines. All kinds of Copper and Plumbing done in the neatest manner at short notice.
Cash paid for old Brass and Lead.
Pottsville, Oct. 16, 1852. 43-tf

PAINTED WINDOW SHADES,
A Splendid Assortment.
The Subscriber has just received a very superior lot of painted Window Shades embracing the latest and most fashionable patterns, varying in price from $1 per piece, at prices at least 20 per cent. cheaper than they can be purchased retail, of the manufacturers. There are several splendid Parlor Patterns in the assortment. For sale, wholesale and retail.
B. BANNAN'S
Cheap Shade, Paper and Variety Store.
Dec 27, 1852. 12—

MINERS' JOURNAL,

AND POTTSVILLE GENERAL ADVERTISER.

I will teach you to pierce the bowels of the Earth, and bring out from the caverns of Mountains, Metals which will give strength to our hands and subject all Nature to our use and pleasure.—Dr. Johnson.

PUBLISHED EVERY SATURDAY BY BENJAMIN BANNAN, POTTSVILLE, SCHUYLKILL COUNTY, PA.

VOL. XXVIII. SATURDAY MORNING, JULY 24, 1852. NO. 30.

TO LEASE.

THE Coal Veins on the Christian Kunkle Tract of Land, belonging to Messrs. Young, Hosack, and others of New York city. This tract of Coal Land is situated West of, and adjoining the lands of the well-known Spring Mountain Mines, in Carbon county, and contains the same choice white ash seams of Coal. A Railroad with a Trail is now being constructed from the heart of the tract, to connect with the Beaver Meadow Road, a distance of between two and three miles, having a favorable down-grade all the way to the point of junction with the Beaver Meadow Road. This Railroad will be finished by the Spring of 1852.

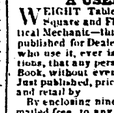
The owners invite colliers to visit the Tract, as they desire to obtain a good Tenant upon fair and reasonable terms. Mr. John Young, at Hazleton, will show the ground and receive proposals for leasing, or application may be made to
J. D. MEREDITH, Agent.
Centre Street, Pottsville.
April 3, 1852. 14-tf

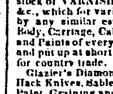
PERFUMERY! PERFUMERY!!
ROUSSELL'S and Hazel's Eau Lustrale tolorante, a most capital article for cleansing the head and hair.
Vinaigre Aromatique, a superior article for the toilette, preferable to the best Cologne.
Storer's Chemical Hair Invigorator.
Velno's Mexican Hair Oil.
Velno's Parisian Fluid for Curling the Hair.
Glenn's Roman Kalydor, for the Complexion.
Purified Charcoal Paste, an excellent article for the teeth.
Treble Extracts, for the Handkerchief
Genuine Bear's Oil in Bottles and Pots.
Glenn's Indian Oil for the Hair.
Roussell's Amandine for chopped hands.
Fenner's celebrated Pomade Divine.
Philocome for the hair, a fine French article.
Hazel's Rose Tooth Paste.
Hazel's Depilatory Powder for removing hair.
Wheeler's Tenberry Tooth Wash.
Roussell's Odontine, a Rose Tooth Paste.
Cologne, Florida, Bay and Lavender Waters.
For sale at the Manufacturer's prices at
B. BANNAN'S Cheap Variety Store.
Feb 14, 1852. 7—

VARNISH, STEAM PUTTY AND PAINT MANUFACTORY.
THE undersigned having made extensive alterations and improvements in his machinery, and having introduced Steam into his Factory, would most respectfully call the attention of his friends and customers through the country to his large and well selected stock of VARNISHES, PAINTS, OILS, GLASS, &c., &c., which for variety and quality cannot be excelled by any similar establishment in the State. Coach Body, Carriage, Cabinet and China Glass Varnishes, and Paints of every description, dry and ground in Oil, and put up short notice in cans of convenient size for country trade.
Glazier's Diamonds, Gold Leaf, Pallette, Putty and Black Knives, Camel Hair Pencils, Varnish, Paint, Graining and Kalsomine Brushes, and English, French and American Glass of all sizes, suitable for Store Fronts, Dwellings &c., with a good assortment of Enamelled and Colored Glass for Public Buildings, Vestibules, &c., &c., constantly on hand and for sale in quantities to suit purchasers, at moderate prices, at the old established Painting, Furnishing and Variety Store No. 60 North Fourth street, west side, below Race st., Philadelphia.
C. SCHRACK.
April 24, 1852. 17—1y

LADIES' COMBS,
Wholesale and Retail—New and beautiful Assortment.
THE subscriber has just received twelve dozen assorted Ladies' Combs, embracing a general assortment, among which are several new and beautiful Patterns, all of which will be sold wholesale and retail at extraordinary low prices. Also children's circular Combs, at
B. BANNAN'S
Cheap Fancy and Variety Store.

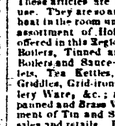
A USEFUL NEW WORK.
WEIGHT Tables of different lengths of Round, Square and Flat Bar Iron, Steel, &c., by a Practical Mechanic—this is one of the most useful works published for Dealers and Workers in Iron, and those who use it, ever issued. So correct are the calculations, that any person can safely buy and sell with the Book, without ever weighing the Iron and Steel.—Just published, price 25 cents, and for sale wholesale and retail by
B. BANNAN.
By enclosing nine postage stamps, the work will be mailed free, to any part of the county.—The Trade supplied at the usual discounts.
June 21, 1852. 4—

GEORGE BRIGHT'S

NEW HARDWARE STORE, 2 doors below Matz's Hotel, and nearly opposite the Miners' Bank, Pottsville, where will be found an excellent assortment of HARDWARE:
Coach Trimmings, Springs, Saddlery, Files, Fine Trays, Britania ware, Assortment of fine Locks, Table Cutlery, Pocket Cutlery, Table Spoons, Anvils and Vices, Assortment of fine Guns, Sheet Iron Crucible, Wire, Tin Plate, Brass Kettles, Sad Irons, Pans and Boilers, Chains, Railroad Traces, Powder and Shot,
Pipe Hand-saws,
&c. &c.
He returns his thanks to the public for the patronage they extended to the late firm of Bright & Pott, and flatters himself that, in his individual capacity, he will be able to deserve and command their continued support by the quality of the goods he has in store, strict attention to business, and the low rates at which he is determined to sell.
GEORGE BRIGHT,
Late of the firm of Bright & Pott.
March 27, 1852. 13-1y

NOTICE.
IMPORTANT TO HOUSE-KEEPERS.

S. HOOVER, Centre Street, Pottsville, Pa., would respectfully announce to the citizens of Pottsville and the surrounding country, that he has added to his large assortment of Cooking, Parlor, Office and Hall Stoves, a splendid article of Summer Range; can either be used in the chimney or in the room; it is moveable; it is a very convenient article for summer use. He has also three sizes of Gas Ovens. These are to be walled in the chimney for Cooking and Baking.—These articles are highly recommended for summer use. They are so arranged that they will not throw the heat in the room unless wanted. He has the largest assortment of Hollow and Iron Ware ever before offered in this Region, such as Tinned and Enamelled Boilers, Tinned and Enamelled Sauce-pans, Iron Boilers and Sauce-pans, Iron Pots and Kettles, Skillets, Tea Kettles, Frying-pans, Flat-irons, Cake Griddles, Grid-irons Roasting-pans, Coffee-mills, Cutlery Ware, &c.; also a splendid assortment of Japanned and Brass Ware, Trays, &c. A large assortment of Tin and Sheet-iron Ware, which he wholesales and retails. He calls the particular attention of the Mercantile Community, Roofing, Spouting, and all kinds of Roof-Repairing done to order. Please call and examine for yourselves. He is determined not to be undersold by anybody.
April 24, 1852. 17-tf

POTTSVILLE ROLLING MILL.

THE SUBSCRIBERS respectfully announce to the public, that their new Rolling Mill is now completed and in full operation, and that they are prepared to supply all kinds of Bar Iron of various sizes, which they will warrant to be superior in quality to any obtained from abroad, at the same prices.
They also manufacture T Rails, for the use of the Collieries and Lateral Roads, weighing from 21 to 50 lbs. per yard, made of the best Iron, and which will be found much cheaper than the imported article.
Being practical mechanics, and having and considerable experience in the Iron business, they flatter themselves that they can give entire satisfaction to purchasers, and will also make it their interest to patronize home manufactures.
HARRIS, BURNISH & CO.
Dec. 6, 1851. 49-tf

BEAVER MEADOW IRON WORKS.

HUDSON & ALLEN, IRON AND Brass Founders, respectfully inform their patrons; and the public generally, that they are now prepared, at the above establishment, to manufacture Steam Engines of every size; Pumps, Railroad and Drift Cars, and every other description of Iron and Brass Castings suitable for the Coal mining or other business, on the most reasonable terms. Iron, Blowing Cylinders for Blast Furnaces and Machine work in general.
Repairing of all kinds done with neatness and despatch, at the lowest prices. All work furnished by them will be warranted to perform well. They would solicit the custom of those who may want articles in their line in this vicinity. All orders will meet with immediate and prompt attention.
S. W. HUDSON,
L. H. ALLEN.
March 15, 1851. 11-1y.

POTTSVILLE IRON WORKS.

GEO. MASON & CO. RESPECTfully announce to the public that they have taken the Establishment known as the Pottsville Iron Works on Norwegian street, where they are prepared to build all kinds of Steam Engines, manufacture Railroad Cars, and Machinery of almost every description, at the shortest notice, and on the most reasonable terms.
—Persons from abroad, in want of Steam Engines, will find it to their advantage to give them a call before engaging elsewhere. [May 11 1f

PASCAL IRON WORKS.

PHILAD'A.—WELDED WROUGHT Iron Flues, suitable for Locomotives, Marine and other Steam Engine Boilers from 2 to 5 inches in diameter: Also Pipes for Gas, Steam and other purposes; extra strong Tubes for Hydraulic Presses; Hollow Pistons for Pumps of Steam Engines &c. Manufactured and for sale by
MORRIS, TASKER & MORRIS,
Warehouse S. E. corner 3d and Walnut sts.

EAGLE IRON WORKS.
IN THE BOROUGH OF POTTSVILLE.—formerly conducted by Chas. W. Pitman. J. Wren & Co. respectfully solicit a continuance of the custom of the works. Being practical Mechanics, they flatter themselves that their knowledge and experience of the business will enable them to turn out work that will not fail to give satisfaction to the most fastidious. They are prepared to manufacture Steam Engines, Pumps, Coal Breakers, Drift Cars, Railroad and other Castings, &c.
All orders thankfully received and promptly executed on the most reasonable terms.
JOHN WREN,
THOMAS WREN,
June 15, 1850—ly] JAMES WREN.

IRON COMMISSION WARE HOUSE,
CENTRE STREET, POTTSVILLE.
THE subscribers are prepared to furnish the Trade, Machinists and Operators, at Philadelphia prices, (freight added) wholesale or retail, best American Bar Iron, manufactured in Pottsville, and warranted of superior quality. Also, tight T rails, suitable for mines; and Cable Chains, furnished at short notice direct from the Importer.
E. YARDLEY & SON.
York Store, Nov. 22, 1851. 47-tf

P. FORD VENETIAN BLIND AND TRANSPARENT WINDOW Shade Manufactory, Wholesale and Retail, No. 22, South 6 Street, Philadelphia. LETTERED SHADES for Store Windows painted to order.
ALSO Reed Blinds, Buff Shades, Paper Curtains, Fireboard Plates, Oilcloths, &c. Gilt Cornices, Bands and Pins, &c., for Drapery Curtains.
August 16, 1851. 32-1y

REPORT
Of the Secretary of the Navy, communicating in compliance with a resolution of the Senate, a Report of the Engineer-in-Chief of the Navy, on the Comparative Value of Anthracite and Bituminous Coals.
NAVY DEPARTMENT, May 21, 1852.
SIR: I have the honor to submit the enclosed report of the Engineer-in-Chief of the Navy, on the comparative value of anthracite and bituminous coals, called for by a resolution of the Senate, passed on the 17th instant.
C. M. CONRAD,
Acting Secretary of the Navy.
HON. WM. R. KING, Pres. of the Senate.

OFFICE OF ENGINEER-IN-CHIEF, U. S. N., February 24, 1852.
SIR: In compliance with your instructions, made in conformity to the orders of the Navy Department in June last, to test the comparative value of Anthracite and Bituminous Coals for the purpose of generating steam, I have the honor to report:
That on the completion of the pumping engine of the dry dock of the New York Navy Yard, I caused experiments to be made with Bituminous (Cumberland) and Anthracite (white ash) Coals; and also on the completion of the United States steamer "Fulton," in January last, I made a series of experiments with the same varieties of coals; the condensed results of all which are herein given. In addition, I would also state, that the United States steamer "Fulton" has been on constant duty several days since the experiments were made, burning constantly White Ash Anthracite.
From a letter from her chief engineer, H. Hunt, Esq., detailing her performance for the first four days, I extract the following: "The engine worked as well as any I ever saw, but the boilers exceeded my calculations; with clean fires very easily keeping forty pounds, cutting off at half stroke without blowers. I will here predict that she (the "Fulton") will do more service at less expense, than any steamer government will have in five years. Whilst she was out on the first four days I was in her, we were frequently shut off or cutting off to run slow, and turning around, running from one vessel to another, so no calculations could be made of her speed or slip of wheel. The furnace doors were open full half the time, to keep steam down, so much more fuel was used than necessary, but the nature of our service was such, that it could not be avoided."
In consequence of the ill health of the chief engineer, he was not able to return in her second trip; the results of her consumption of coal on that occasion, are, therefore, extracted from a letter written by the assistant engineer, S. McElroy, showing the following: "Running time with White Ash Anthracite, January 25 to 28, seventy-one hours. Total coal used, 69,480 pounds, average 992 6-10 pounds per hour." The above extracts are made, not because they are the most favorable which occur in the log, but as they show the action of the engine and boilers for several consecutive hours. Nothing can be smoother than the motion of the engine under ordinary running circumstances; and in relation to the generative power of the boilers, it is more difficult to keep steam down than up.
It is unnecessary to use the blowers for ordinary work, as the natural draught proves abundantly sufficient for twenty to twenty-five pounds of steam, with sixteen to eighteen turns; although they are undoubtedly of great value in cases of emergency, and necessary to the prompt and proper management of the fire room, with Anthracite Coal. The "Fulton" will have no difficulty whatever in making twelve knots in ordinary sea weather as long as the bunkers hold out.
A more extended series of experiments would undoubtedly be more favorable to the Anthracite, owing to the fact that small quantities were put in the furnaces and almost entirely consumed while the engine was working; it being well known that a small body of Bituminous coal will burn longer than the same amount of Anthracite spread thinly over the grates.
The cost of the two kinds of coals used in the experiments were as follows, at the N. York Navy Yard: Anthracite $3 90 per ton, Bituminous $5 65 per ton.
I have made no comparison of the relative costs of the two kinds of coal, as it may vary according to different localities and periods of delivery, and cannot therefore be considered a fixed element; but have confined the results entirely to their generating powers deduced from the following experiments:
1. Experiments with Bituminous coal, made with the boilers of the United States steamer Fulton, at the New York Navy Yard, January, 1852.
The temperature of the water in the boilers being at 38 deg. F., and the temperature of the boiler room 18deg., the fires were lighted at ten hours thirty minutes, A. M.
At eleven hours forty minutes, A. M., the temperature of the water was 212deg. F., and steam began to be generated at the atmospheric pressure. Time raising steam, seventy minutes. The temperature of the boiler-room had now increased from 18deg. to 32deg. F. At eleven hours fifty-four minutes A. M. the steam pressure in the boilers was thirty pounds per square inch above the atmosphere. Time of obtaining thirty pounds of steam, one hour twenty-four minutes from a temperature of 32deg. F.—Up to this time there had been fed into the furnaces one thousand pounds of dry pine wood, equal to five hundred pounds of coal, and two thousand eight hundred and twenty-six pounds of (Cumberland) bituminous coal. Total, three thousand three hundred and twenty-six pounds.
The engine was now set in operation to work off all the steam, which the above amount of coal would generate, no more being fed to the furnaces. In fifty-three minutes the steam pressure was reduced from forty pounds to five pounds, and the number of double strokes of piston made from forty-one to seven, when the engine was stopped. During the time the engine was in operation the steam was cut off at half stroke.
The engine consisted of one cylinder, fifty inches diameter, and ten feet four inches stroke. The space between cut off valve and piston, including clearance, to be filled with steam per stroke is 3.094 cubic feet. The calculation of the amount of water evaporated is made from the quantities of steam measured out by the cylinder, divided by the relative bulks of steam of the experimental pressures and the water from which it is generated.
The initial pressure of the steam in the cylinder is taken at one pound less than in the boilers. The space displacement of piston filled with steam, per stroke is 70.448 cubic feet, to which must be added the above 3.094 cubic feet, making a total of 73.542 cubic feet.

Mean pressure above atmosphere, in pounds.	Number of double strokes of piston per square inch, in cylinder.	Cubic ft. of water made, evaporated.
32½	41	10.226
25	34	7.311
22½	32	6.483
19½	31½	5.879
16½	31	5.352
14	30	4.796
11½	26	3.797
9	23	3.075
7½	21	2.631
5½	12	1.393
4½	7	0.963
		51.911

Taking the weight of a cubic foot of sea water at 64.3 pounds, the total weight evaporated is (51.911X64.3)=3337.877 pounds. The boilers of the Fulton contained 82,000 pounds of water at the initial temperature of 32deg. F., which was raised to 212deg. F., and 3337,877 pounds of it evaporated by three thousand three hundred and twenty-six pounds of coal.
Now it requires five times and a half as much caloric to evaporate a given bulk of water from a temperature 212deg. F. as to raise it to that temperature from 32deg. F. The quantity of fuel, therefore, expended in raising the water from the initial temperature to that of 212deg. F., compared to that expended in evaporating the 3337,877 pounds from that temperature, will be as (82,000X180deg.)=14,760,000 to (3337,877X990deg.)=3,304,498,23, or as 4.4666 to 1,000; consequently 3326-4.4666=744.6 pounds of coal were consumed in evaporating 3337.877 pounds of sea water, or 4,483 pounds of water per pound of coal. It was intended to have made, on the following day, an experiment, under precisely the same circumstances as above, with anthracite; but it was found impossible from the presence of ice to work the engine, the experiment was therefore only made so far as regards the time of getting up steam, with the following results, viz:
The fires were lighted with the same quantity and kind of wood, and the same quantity of coal that had been used the day previous. At seven hours and twenty minutes A. M. the temperature of the water in the boilers being 38deg. F., and that of the boiler room 32deg. F., with the natural draft, the temperature of the water at eight hours and five minutes was 212deg. (steam) and the boiler room 43deg. F. Time to generate steam forty-five minutes. At eight hours and twenty minutes the steam pressure in the boiler was thirty pounds per square inch.—Time of obtaining thirty pounds of steam from water at 38deg. F. was one hour.
With the bituminous coal it will be seen that it required seventy minutes to obtain steam from water at the temperature of 32 deg. F., while it only required forty-five minutes with the anthracite; being a difference of time in this respect of about thirty-six per cent. of the bituminous time.
The data for a comparison of the evaporative values of the coals was obtained by another experiment as follows:
Experiments with White Ash Anthracite made with the boilers of the United States Steamer Fulton, in New York Bay, January 1, 1852.
This experiment was made with the steamer under way, while steaming with steady pressure of steam and revolutions of the wheel, as follows:
Steam pressure (initial) in cylinder per square inch above the atmosphere, twenty-five pounds; double strokes of piston per minute, twenty-one and one-third; cutting off at from commencement of stroke, three-eighths; consumption of coal per hour, eighteen hundred pounds.
From the above data, there was filled per stroke 52.837 cubic feet of the space displacement of the piston, to which add 3.094 cubic feet of space comprised between cut off valve and piston; making a total of 55.931 cubic feet of steam of twenty-five pounds pressure, which would be per minute 55.931X42⅔=2386.39 cubic feet, and per hour 143,183.40 cubic feet. Dividing this last number by the relative bulks of steam of the pressure generated, and the water from which it was generated, we obtained 143183.40-684=209.322 cubic feet of sea water, which at 64.3 pounds per cubic foot, amounts to 13,460.047 pounds, evaporated by 1800 pounds of coal, or 7.478 pounds of sea-water per pound of coal.
3. Experiment with white ash anthracite coal made with the boilers of the pumping engine at the United States Dry Dock, New York Navy Yard.
A comparative experiment was made with the boilers of the pumping engine at the New York Navy Yard, in October, 1851, on the comparative advantages of anthracite and bituminous coals; all the conditions were as nearly alike as practicable. With the anthracite coal a combustion of nine hundred and eighty pounds per hour, evaporated a sufficient quantity of water to supply the engine with steam of twelve pounds pressure above the atmosphere, per square inch, for four hundred and twenty-five double strokes of piston per hour, the steam pressures being alike in both cases; the economical values of the coals will be represented by the number of double strokes of piston made, divided by the quantity of fuel per given unit of time:
425 / 294 = 1.4433 : 980 / 1100 = 0.8909, or the anthracite is better than the bituminous in the proportion of 0.4337 : 0.2673 = 1.623 to 1.000.
It is proper to remark that these boilers were expressly designed for burning bituminous coal.

COMPARISON.
The coals used in these experiments were the kinds furnished by the agents of the government for the use of the United States Navy-Yard and Steamers, and were taken indiscriminately from the piles in the yard without assorting.
The bituminous was from the "Cumberland" mines. The anthracite was the kind known as "White Ash Schuylkill."
From the preceding data, it appears that in regard to the rapidity of "getting up" steam, the anthracite exceeds the bituminous thirty-six per cent.
That in economical evaporation per unit of fuel, the anthracite exceeds the bituminous in the proportion of 7.478 to 4.483 or 66.8 per cent.
It will also be perceived, that the result of the third experiment on the boilers of the pumping engine at the New York Dry Dock, which experiment was entirely differently made and calculated from the first and second experiments, gave an economical superiority to the anthracite over the bituminous of 62.3 per cent.: a remarkably close approximation to the result obtained by the experiments on the "Fulton's" boilers, (66.8 per cent.,) particularly when it is stated that the boilers and grates of the pumping engine were made with a view to burning bituminous coal, which has been used since their completion; while those of the "Fulton" were constructed for the use of anthracite. The general characters of the boilers were similar, both having return drop flues.
Thus it will be seen, from the experiments, that, without allowing for the difference of weight of coal that can be stowed in the same bulk, the engine using anthracite could steam about two-thirds longer than with bituminous.
These are important considerations in favor of anthracite coal for the uses of the Navy: without taking into account the additional amount of anthracite more than bituminous that can be placed on board a vessel in the same bunkers, or the advantages of being free from smoke, which in a war-steamer may at times be of the utmost importance in concealing the movements of the vessel, and also the almost, if not altogether, entire freedom from spontaneous combustion.
The results of the experiments made last spring on the United States steamer "Vixen" were so favorable, that I recommended to the Bureau of Construction, &c., the use of anthracite for all naval steamers fit that time having, or to be thereafter fitted with iron boilers; particularly the steamers "Fulton," "Princeton," and "Alleghany," the boilers for all of which were designed with a special view to the use of anthracite, and with the approval of that bureau.
The "Fulton's" bunkers are now filled with anthracite, and the consumptions referred to in the engineer's report on that steamer show, during the short time she has been at sea, that the anticipated economy has been fully realized.
In view of the results contained in this report, I would respectfully recommend to the Bureau of Yards and Docks, the use of anthracite in the several Navy-Yards, and especially for the engine of the Dry Dock at the New York Navy-Yard.
In conclusion, I desire the approval of the Bureau to make such investigations as my duties will permit, with regard to the experience of the durability of copper boilers, when used with bituminous or anthracite coal; which can be done without any specific expenditure.
The inquiry may prove highly important to the Navy Department, as the use of anthracite under copper boilers has been heretofore generally considered as more injurious than bituminous coal, and is consequently not used by government in vessels having copper boilers.
Respectfully submitted by your obedient servant,
CHARLES B. STUART,
Engineer-in-Chief, U. S. Navy.
Commodore JOSEPH SMITH,
Chief of Bureau of Yards and Docks.

LETTER OF THE ENGINEER-IN-CHIEF OF THE NAVY,
In relation to Coals, addressed to the Chairman of the Committee on Naval Affairs.
MAY 27, 1852.—Referred to the Committee on Naval Affairs, and ordered to be printed.

OFFICE ENGINEER-IN-CHIEF, U. S. Navy, May 27, 1852.
SIR: The Senate, by resolution, having called for my reports to the Navy Department, giving the results of several experiments to test the relative value of anthracite and bituminous coals for generating steam, and referred the same to the Committee on Naval Affairs, I have thought that the results obtained from additional tests and experiments, made in this country and England, would be of service to the Committee, and trust that the importance of the subject, both to the interests of the government and of individuals, will be considered a sufficient apology, if any be needed, for the liberty I have taken in addressing you this communication.
It should be remembered that what is required to be known on this subject, is neither the absolute nor relative evaporation by coals under conditions that never occur in practice, (as too many experiments are conducted,) but the facts to be determined are, the results which can be obtained from them under the ordinary circumstances in which they are used in marine boilers.
With this view I have prepared the following tabular statement, showing the actual evaporation of water effected by bituminous and anthracite coals in the boilers of several naval steamers, and in those of some transatlantic and river steamers plying to and from New York the past few years.
This table, therefore, from being prepared with care from the steam logs of the different vessels (those of the Navy being on file in this office) is of great value; more so, undoubtedly, than if the results had been obtained from a series of special experiments made under the circumstances not normal to the practice, which results, therefore, must be extensively modified before they could be received for practical guides.
The table includes all the cases I have been able to obtain at this time, where the data were unexceptionable; it extends in most instances over a course of several years steaming, and the average evaporation thus obtained, although not equal sometimes to the maximum of special experiments, is in my judgment, more entitled to confidence than any single experiment made with greater critical accuracy, but on too small a scale for trustworthy results.
Of the latter character, I should rank those of W. R. Johnson, Esq., made under the directions of the Navy Department, in 1843, in the report of which he states that "on each sample of coal were made from one to six trials, according to the quantity furnished. The coal consumed in one trial never exceeded 1567 pounds—this being the greatest quantity which the apparatus could receive in the period allotted to each experiment, including the time required for cleaning out the residue, making the necessary adjustments and preparing for a new trial. The total weight of coal consumed in the trials of evaporative power has been nearly sixty-two and a half tons; and the weight used, on an average, nine hundred pounds per trial"—being less, it will be seen, than half a ton per trial, or not three tons for the greatest number of trials made with any one kind of coal, not equal to a two hours' consumption of an ordinary sea steamer.
These experiments were not only very limited in their extent, but were made with a boiler entirely different in its construction from those in Naval and sea steamers, and not at all adapted for that service, and cannot therefore be compared in value to the following practical tests, deduced from the consumptions of hundreds of tons of coals on each steamer named in actual service.

TABLE OF PRACTICAL TESTS OF DIFFERENT VARIETIES OF COAL

NAME OF VESSEL.	TRADE	Sea water evaporated from temperature of condenser (100° Fahrenheit) by 1 lb. of bituminous coal. POUNDS.	Sea water evaporated from temperature of condenser (100° Fahrenheit) by 1 lb. of anthracite coal. POUNDS.	REMARKS.
Michigan,	United States Navy,	*5.000	—	Fresh water
Mississippi,	do do	†4.780	—	Sea water
Spitfire,	do do	†4.870	—	do
Engineer,	do do	†4.531	—	do
Alleghany,	do do	†5.600	—	do
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