Scientific American

NEW YORK, JANUARY 18, 1851.

The Future---Industry.

A prudential preparation, and a far-reaching sagacity to anticipate something of the future, are evidences of superior mental endowments, and a superior civilization. The barbarian cares only for the present—he revels in the dance or the feast of momentary enjoyment, heedless of those provisions for the future which distinguish the civilized man. The wise man derives lessons from every event he witnesses, and treasures up the experience of the past to guide him for the future; he remembers the teaching of the wisest and most experienced of mental philosophers—the son of Israel's Shepherd King, and he does not forget how the sluggard is commended to "go to the ant, consider her ways, and be wise: for she provideth her meat in summer, and gathereth her food in harvest."

Last week, while taking a brief survey of the progress of science and discovery during the past fifty years, we were particularly struck with the accumulated number of discoveries which have rewarded unremitting application and industry, and which have conferred honor on many low-born names. Many discoveries have been made, apparently by accident, but, as a general thing, we find they were made by men of observing and reflective minds, and who were prosecuting researches with some distinctive object in view. It has often happened, that men who have studied and labored unsuccessfully in the search of a certain object, have been rewarded with quite a different but more important one, than that for which they had so long struggled and studied. This was the case with Newton and the apple, and the grand discovery of the metal, potassium, by Davy.

We instance these cases, and have chosen this subject, to give a word of advice to our young men especially. Industry is sure to have its reward sooner or later, and young men who, in the common course of providence, have a good future before them, should never forget this. Let your attention and labors be rightly and well directly. James Watt had labored much and studied long before he was rewarded; but the reward came at last. Sitting in deep reflection upon his favorite subject—the steam engine—the invention of the grand improvement, viz., the separate condenser, beamed upon his mind like a flash of lightning,—hundreds of others have been rewarded in the same way. "He that trifleth with time layeth up for himself rags and sorrow." In our long winter evenings, our young men should endeavor to spend the hours at their disposal to some useful purpose. Innocent amusements are good in their place—we like to see young people enjoying themselves; but oh, how many triflers of time do we see every week, and how much time we see wasted every day, which, if well spent, would cause future consolation and enjoyment,—whereas we can expect to see no reward reaped by those who are so unwise, but that of regret, and, it may be, poverty. Almost every person has cause to regret misspent time.

Let every one who reads this determine to employ his future moments better than the past. At the opening of a new year it is a good time to commence life anew. Good purposes are good things, for no man, without a good purpose, ever pursues good objects. The advice given will apply to men in every condition of life, and in every calling and profession. Lay out a right-good path for the future, and "whatsoever thy hand findeth to do, do it with all thy might."

A New Locomotive for Cuba.

Messrs. Norris and Brother, of Philadelphia, have just finished another of their large class of locomotives for one of the railroads in Cuba. We see that the fine locomotive works of Norris, in Schenectady, N. Y., are to be let.

New Aerial Propeller.

An inventor named Tough has invented a new Aerial Propeller; it is a remarkably *tough* subject.

More about Agricultural Chemistry.

A society in Scotland has been testing different manures in the production of turnips, which must be of interest to a great number of our readers. There were fifteen fair experiments made, but those of the greatest importance were between manure kept under roof and manure exposed to the weather. We will refer only to these two, but stating that from seven tons of Peruvian guano, 25 tons 8 cwt. of turnips were produced on the acre. This was the largest produce of the fifteen experiments. Forty loads to the acre of uncovered kept manure, and 40 loads kept under cover, gave the following resuls:—that kept under cover produced 20 tons 16 cwt. per acre, that from the uncovered produced 20 tons 8 cwt.—a very small difference indeed. As two-thirds of our people are engaged in agricultural pursuits, this subject is of great importance to them, and we cannot do better than publish that part of the report of the Club mentioned (St. Quivox Farming Club):

"The chief feature of interest involved in these experiments is the comparison between the crops grown on farm manure kept under a roof, and those on dung kept in the usual manner. It is an important contribution towards a solution of the question—whether it is profitable to roof over manure heaps at farm steadings? It is needless to expect that this point will be settled in the laboratory of the chemist. As in many other things, the farmer must in all likelihood, find out the way for himself, and the chemist will afterwards tell him why his practice is correct. At a recent agricultural meeting, Prof. Way, when asked if the advantages gained by covering a manure heap were worth the expense, replied that the question was an unfair one, as he could not be supposed to know what the expense would be; but, as a principle, he would say by all means cover it over, and if they must dilute their heap, dilute it when they wished, and not let the heavens do it for them. Even if mixed with soil, he wished to say that it would do better to cover it. It may as well be said, however, that if the heap must be diluted in order to keep it in a cool condition, it can in no way be so cheaply done as by rains; and if these should wash out a portion of the soluble fertilizing matter, a good tank can be constructed to receive it at far less expense than a large roof; and besides, we have here a fact, and one fact is said to be worth a number of theories, that the manure kept in the open air was as valuable for the growth of turnips, as that kept under a roof. The quality may be a little lessened by exposure; but what remains appears to be weight for weight of equal quality. Nor is it likely to lose much if mixed with soil containing a considerable portion of alumina. Professor Way has himself shown, by his admirable discoveries, that such soils possess the power of absorbing and retaining the fertilizing properties of manure in so effectual a manner, that no amount of rain will wash them out. With this knowledge, it is difficult to discover what great good can result from roofing over a heap of dung mixed with earth. In these times it will not do for farmers to undertake expensive works which may be of doubtful utility; and it is therefore satisfactory to find that some progress has been made in the accumulation of data, from which a correct judgement may be formed. A few more of careful, conducted experiments, to confirm or disprove those of our respected President, will be the simplest way of setting the matter at rest; for, with all deference to those who guide us to principles, it is facts from the field which will most readily influence practical men, at least so long as the knowledge of these guides is so incomplete that their deductionss are frequently found not to be trustworthy."

A new theory, we see, of enriching waste lands, is brought forward by a Mr. Baldwin, of Virginia, in the "Plow, Loom, and Anvil." It is simply to cover or shade the waste lands—prevent its exposure to the sun. Heavy manuring is a more reasonable method, for sure and quick results; and, after all, we must say that the report above is inconclusive. Let five tons of manure be set aside, under roof, for 6 months, and 5 exposed to the weather, and then test them fairly. Turnips are a good test crop.

Meeting about New York Gas.

A meeting was held at the Chinese Rooms, on Wednesday evening last week, the object of which was, to advocate a Gas Reform and approve the veto of Ex-Mayor Woodhull.—Speeches were made by C. E. Lester, Horace Greeley, a Mr. Camp, a Mr. Price, and others. Mr. Camp stated that he had a gas made out of refuse materials, which was purer, and could be made for one half less than the kind made from coal by the New York gas companies. Mr. Lester and Mr. Greeley spoke about the discoveries and improvements which had been made, were making, and are to be made, which left coal gas far behind the progress of the age. We must say that all this wants confirmation. Very little improvements have been made in the manufacture of coal gas for twenty-one years. Where cannel coal is cheap and where the coke can be sold for a reasonable profit, no gas has been able to compete with that of coal. We hope the cannel coal of Virginia will be able to be brought to New York and sold cheaply. In some English cities every working man burns gas in his house, and the cost per annum is not to him one-fourth of what oil, camphene, or candles cost us here, and certainly one-third the price of our gas. The gas companies' contract will run out in two years, and then the lighting of the city should be left to open competition. Let the Common Council now make open proposals for a contract, to go into operation when the present contract expires. That will bring out the pith of those who propose to supply us with cheap gas. Let there be fair competition in this thing; let every thing be done openly and above board. We would like to see gas produced so cheap that it would be introduced and used in all private houses. This, we believe, could be done by a strong, wise, and spirited gas company; for, if it has been done in other quarters of the world, it surely can be in New York.

Drawing in Academies and Colleges.

We have received a letter from a correspondent, stating that Mechanical Drawing is taught, Minifie's work being the class book, in Norwich University, Vt. We have also received a catalogue from our correspondent (J. B. T. Mead, Cadet, N. U.), and we are well pleased with the course of instruction. The term opened on the 3rd inst. Candidates who do not pursue the regular college course are admitted to the scientific course, and are required to sustain a satisfactory examination in English grammar, geography, and algebra through equations of the first degree. To young mechanics we say, by all means save all the money you can, and give yourselves the best education possible. Is there one man living who does not regret misspent time and money of youthful days? Without a good education, no man becomes distinguished. Oh, how many men, now ignorant, might have been educated had they only saved up a few cents every week when they were young. It is indeed true that the majority of men appear not to have the right stamina for studying a subject that requires severe reflection; but it is also true, that a taste for dry study can be cultivated, and a faculty for it can be easily destroyed. To young men we say, learn—learn when you are young, and apply your wisdom when you grow up into manhood and old age.

Sash-Bar Grooving Machine and old Gen. Bentham.

The British papers have lately been boasting of an invention made by Mr. Paxton, the architect and designer of the Great Glass Palace, for grooving sash-bars, for which he received a medal from the Society of Arts, in 1841. This has called out a correspondent of the London Mechanics' Magazine to the defence of the ingenious Sir Samuel Bentham, the original inventor of planing machines, a subject in which a great number of our readers are interested. The patent of Sir Samuel, 28th April, 1793, reads thus, "besides the general operations of planing, rebating, morticing, sawing in curved, winding, and transverse directions," he invented an apparatus "for preparing all parts of highly finished window-sash." In 1797 Bentham proposed and introduced steam power into the Portsmouth Royal Dock Yard, and new machinery for working in wood, which he described in a letter to the Navy Board as follows:

"1st. By means of reciprocating motion."

"Sawing in general; particularly straight work—such as sliding timber, slitting deals, cutting, quartering, and straight planks of all kinds."

In the margin of a certified copy of this letter is written, "All introduced except sliding timber."

To return to the proposal.

"2ndly. By means of rotary motion."

"Edging, tongueing, grooving, rebating and cross-cutting into lengths, deals of all sorts for joiners and house carpenters' work."

Against this article is written in the margin, perhaps as late as 1813, "Long since introduced with great success."

Then follows in the proposal,

"Tongueing and grooving piles for dam-work."

"Converting slabs and offal timber into treenails."

This was also executed, so that slab and offal theretofore sold mostly for fire-wood, was by means of his machinery made available for the fabrication of various articles of secondary importance.

To the above particulars, Sir Samuel added, "These, amongst various other instances, have occurred to me as giving occasion in his Majesty's dockyards for the substitution of the invariable accuracy of machinery, to the uncertain dexterity of more expensive manual labor."

By sir Samuel's machinery junctures were as accurately cut as any other parts—even dovetails, mortices, and tenons.

The original of this letter, 1797, doubtless is amongst the records at the Admiralty; there is a copy of it in the books of the Inspector-General's-office, and a certified copy exists in private hands.

New York Streets---Mud.

We can boast of a great many things, such as the largest city, the greatest amount of shipping, steamboats, &c., but all these are nothing to brag of in comparison with our muddy streets. There are gulfs in the Catskill Mountains, but what are they in comparison with the gulfs in some of our intersecting streets. A horse and cart almost disappear in the puddles, and donkeys would never come out alive. It is related that a little boy, one of those hard-faced, knotty-headed little fellows so plentiful in some of our by-streets, was seen to disappear head-first on last Friday, from the curbstone in front of the Chinese Museum. His mother, a podgy little body of a peculiar stamp, was looking on at the time, and lifted up her hands in mute despair at his sudden departure into such a region. A crowd was soon collected, gazing into the place where our little hero had disappeared, some proposing to get a long pole, and others shouting for grappling irons, when lo and behold! a slight movement was seen near the mud top on the other side of the street, then a waggling of a little gritty half brown and some other mixed colored head, and then the little fellow struggled up, looking over to his mother with an eel in the one hand and a mud turtle in the other, and with such a grin—oh! to have seen it. It is reported that the Mayor and Commissioner of Streets came up about the conclusion of the feat, and have become satisfied about the productiveness of New York streets. Proposals will soon be issued for the planting of eel-grass, and the full protection of our street fishing ponds.

Henry M. Paine, at Worcester, has received by the last steamer from England, his letters patent, which secure to him and his associate the benefits derived from his grand discovery by the people of Great Britain.

A rich vein of the phosphate of lime, about 6 feet wide at the surface, containing 90 per cent. of the phosphate, has just been discovered in New Jersey.

☞ Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING JANUARY 8, 1851.

To J. M. C. Armsby, of Worcester, Mass., for improvement in Candlesticks.

I claim casting the fly-wheel of the corn sheller solid with the feeding wheel, so as to bring it between the two bearings of said wheel, as herein before set forth.

[Some mistake of the Patent Office here.]

To David Baird, of New York, N. Y., for improvement in Spring Mattresses for invalids.

I claim, first, the employment of the end stays, having rule joints, allowing a limited range of motion and standing in a bracing position, substantially in the manner and for the purpose set forth.

Second, I claim the centre supports for rendering that part of the mattress permanent when desired.

To Thomas Bennet, of New York, N. Y., for improvement in Rotary Pumps.

I claim the arrangement of the curved water ways in the annular space above the fan or paddle, when substantially as described, in combination with the rotating fan or paddle wheel, substantially as described, and for the purpose specified.

And I also claim the self-adapting valves, substantially as described, and governing the apertures leading to the annular space above, in combination with the rotating fan or paddle wheels, and the curved water ways, substantially in the manner and for the purpose specified.

To E. B. Bigelow, of Clintonville, Mass., for improvement in Looms for weaving Tapestry Carpets with parti-colored warp.

I claim regulating the delivery of giving out of one or more warps or chains, by the separate tension of each, substantially as specified, in combination with a ground or controlling warp, which determines the length of the cloth warp, regulated by its tension and controlled by a break, or an equivalent thereof, when the lathe beats up, substantially as specified.

I also claim the employment of fingers, moving or vibrating independently of the lathe, substantially as and for the purpose specified.

To Francis Draper, of East Cambridge, Mass., for improvement in Fountain Inkstands.

I claim the arrangement for cutting off the communication between the cap and the main fountain of ink, by means of a layer of cork, or other similar substance, in the bottom of said fountain, and a cork, or other similar stopper, fitted on the bottom of the cup tube, or the lower end of said extended cup tube pressing against said layer, as set forth, in combination with the above specified arrangement, the inner cylinder in which said stopper moves as a piston, by which the air is more effectually excluded from the main fountain of ink.

To Wm. Maguire, of Cincinnati, Ohio, for improvement in machines for Jointing Staves.

I claim the arrangement, substantially as herein described, of a circular rest, having a sliding motion to and fro, in the plane of its axis, and having, around its perimeter, catches for the retention of the stave during the process of jointing, and rotating the distance from stave to stave, at every forward stroke, and held fast for the action of the rotating jointers upon the stave at every return stroke, the jointer and circular rest being so arranged as to impart, at the same time, to the stave edge, any given bevel and taper, according to the size and bilge of the cask.

To S. W. Marston, New York, N. Y., for improved Fly-tumbler Lock for fire-arms.

I claim the fly-tumbler arranged and combined with respect to the sear and the cock, in the manner and for the purposes set forth.

To Edward Neely, of Savannah, Mo., for improvement in Grass Harvesters.

I claim the manner herein described, of suspending the cutter ring from the wheel by means of straps, or other yielding material, for the purpose herein described.

I also claim the combination of the cutters, bevelled cutter ring, and straps, for the purpose of raising the cutter ring over any obstruction coming against the edge of the knife, as herein described.

I also claim the manner of arranging the guide board, standard, arm, and strap, secured as described, for the purpose of guiding the machine and allowing the parts to yield to a sudden stopping of the machine, or to irregularities in the ground, for the purpose and in the manner described.

To Jacob Neff, of Philadelphia, Pa., for improvement in Electro-Magnetic Engines.

I claim the insulated discs, in combination with the platina points, to act in concert with the magnetic wheels, in manner and form, and for the purposes described.

To Cunningham H. Pennington, of Rome, Ga., for improved arrangement of arches in bridge-trusses.—Ante-dated Dec. 9, 1850.

I claim the method herein described, of combining and arranging the several arches of a bridge, so as to make each arch alternately the upright and inverted arch, as it passes from one span of the bridge to another, and vice versa, when one set of arches have their remotest distance from each other, and their greatest sustaining point, directly over and under the points, when the other set of arches are changing from upright to inverted arches, or vice versa.

To James Shields, of New York, N. Y., and Samuel Pierce, of Troy, N. Y., for improvement in Coal Stoves.

We claim the method, substantially as herein described, of supplying currents of atmospheric air to the products of the combustion, at or near the thread leading from the fire chamber to the flues, in combination with what is known as Nott's fire-chamber, having the draught throat leading therefrom, between the top and the grate, the upper part of the fire pot may constitute a feeder or chamber of preparation, substantially in the manner and for the purpose specified.

To S. R. Simpson, of Springfield, Ohio, for improved Parallel Vise.

I claim the attaching the lower end of the moving jaw of the vise to a block that is attached to and moves with the end of the screw, in the manner and for the purpose described.

To A. L. Simpson, of Durham, N. H., for improvement in Ox Yokes.

I claim arranging in the beam of the yoke two draft staples, some six inches apart, in lieu of one at the centre and the combination or use therewith, of a branch chain of proper length, connected to the main draft chain, at a proper distance from the beam, and the adjustable hook, for modifying the length of the branch chain, as specified and for the purpose set forth.

To James Warner, of Springfield, Mass., for improved means for revolving the breeches of repeating fire-arms.

I claim the cranked shaft operated by the tumbler, having its axis of vibration in the line, or nearly so, with the axis of rotation of the cylinder, substantially in the manner set forth.

R. G. Westacott, of Worcester, Mass., (assignor to R. G. Westacott, E. L. & N. K. Lombard, of Boston, Mass., or elsewhere) for improvement in the manufacture of Caviar.

I claim salting the roe or ova, whereby extraneous matters are separated, the same consisting in suffering it to stand in pickle, or a strong saline solution, or until it undergoes a process by which ova, and such extraneous matters separate from one anothor, the former rising to the surface of the pickle, while the latter falls to the bottom of it.

And I also claim the combination of the male sturgeon oil, as above mentioned, with the salted ova, for the purpose of improving the manufacture thereof, as specified.

For the Scientific American.

Mechanical Principles.--No. 3.

ACTION AND RE-ACTION.—Perpetual motion has always been a favorite subject with tyros in mechanical principles, and the subject has lately been renewed in the shape of Mr. Paine's gas light. There is no connection, however, between strictly mechanical action and a combination of mechanical and chemical action: those who make such comparisons do not understand the subject; for, viewed in the light in which Mr. Paine's light has been called by a gentleman "perpetual motion," the steam engine, as it now stands, is just as much so. Why? because one man can dig as much coal in one day as will supply an engine of 100 horse power for the same time. The steam engine, therefore, gives out a far greater mechanical result than the labor required to produce the elements and feed them to the engine to call forth its powers. Strictly speaking, there can be no such thing as perpetual mechanical motion. Why? because "*action* and re-action are equal and opposed to one another." *Inertia* is simply a principle of matter, or quality in all bodies, by which they can neither generate nor destroy motion, it therefore follows that when bodies act upon one another, in any way whatever, the total quantity of motion, in a given direction, after the action takes place, must be the same as before it; for, if it were otherwise, some motion would be produced by the action of the bodies, which would contradict the principle that they are inert. Mechanical action does not mean any inherent active principle in bodies, but the effect of motion in bodies. If two balls of glass were projected opposite to one another in a tube, both balls being 12 pounds, with a velocity of 100 feet per second, the momentum of each would be $12\times100=1200$, therefore the momentum, at the point of contact, where they meet, would be 2,400. This would shatter them both to pieces. If one, in motion, struck the other when stationary, the ball, in all likelihood, would not be broken, for the momentum exerted would be only one half. The second ball, therefore, if it could be carried along with the moving one, would be reduced in velocity, but the amount of moving matter would be doubled, consequently the quantity of motion (momentum) would be the same, thus proving that action and re-action are equal. Momentum is the quantity of matter multiplied into its velocity. A ball of 12 pounds weight moving at a velocity of 10,000 feet per second has double the quantity of motion (momentum) that a ball of the same weight has, when moving with a velocity of only 5,000 feet per second. A body of 5 pounds weight, moving at a velocity of 10,000 feet per second ($5\times10,000=50,000$) has more momentum, or force, than 50 pounds moving only at the rate of 500 feet per second, ($50\times500=25,000$), but 50 lbs., moving at the rate of 1,000 feet per second, has as much momentum as 5 pounds moving at the rate of 10,000 feet per second. A piece of tin on a mandril, if made to revolve at a great velocity, will cut through iron, because it has so much of a superior momentum as to counterbalance its defect in hardness, as compared with the iron. A round ball, without a cutting edge upon it, when shot from a cannon, will pierce through iron plates, with the greatest ease. The steam pressure on a piston, if the area is 100 inches, and the pressure 100 lbs on the square inch, is the same as the weight of a body amounting to $100\times1000=100,000$ pounds, and the velocity of the piston at 300 feet per second, will give an amount of momentum equal to $10,000\times300=3,000,000$, lifted one foot per second, or a horse power of 5,454 6-11, for a horse power, is a unit of 33,000 lifted one foot high per minute. If we say 300 feet per minute, we have a horse power 60 times less, or 90 10-11 horse power. When the velocity in feet and the weight are multiplied into one another, the resultant may be called the whole weight moved one foot in the time specified.

MACLAURIN.

MESSRS. EDITORS—In last week's Scientific American it was stated that "a ball of lead, 2 inches diameter, will fall faster than a ball of lead one inch." This I think, is incorrect and contradictory to the known laws of gravitation. As the earth's attraction acts separately and equally on every particle of matter, without regard to the nature or species of the body, it follows that all bodies must be moved with the same velocity. If two equal particles of matter be placed at a certain distance above the surface of the earth, they will fall in parallel lines and with exactly the same speed, because the earth attracts them equally,—in the same manner a thousand particles would fall with equal velocities. Now, these circumstances will in no wise be changed if those 1000 particles, instead of existing separately, be aggregated into two solid masses, one consisting of 990 particles, and the other of 10. We shall thus have a heavy body and a light one, and, according to our reasoning, they must fall to the earth with the same speed. W. A. BLACK.

Philadelphia, Jan. 6, 1851.

For the Scientific American.

Belts and Pulleys.

In Vol. 6, page 53, of the Scientific American, is an inquiry in regard to the use of thick and thin belts to drive machinery. I have found by experiment, that if equal weights were suspended upon opposite sides of the same pulley, by straps of equal weight, but of unequal thickness, the weight suspended by the thick strap would preponderate, and which seems evident, from the consideration that the thick belt carries the weight further from the centre of motion—the inside of the belt, next to the pulley, not being strained as much by the weight as the outside, in consequence of the bending of the strap, thereby increasing the strain on the outside, while it is proportionably diminished on the inside, and, in effect, increasing the size of the pulley by so much of the thickness of the strap as is not strained. It therefore becomes obvious that, as the pulley is enlarged by this means, a less number of revolutions will be produced by a thick belt than by a thin one, provided, however, that both belts have the same velocity; but, as it is evident that if the driven pulley is enlarged, the driving pulley must also be enlarged by the same means, consequently the velocity of the belt alone will be increased, while that of the two pulleys remains the same.

E. M. CHAFFEE.

New Haven, Dec. 23, 1850.

Coal for Gas.

The London "Journal of Gas Lighting," for last November, has an elaborate article on the comparative lighting powers of different kinds of coal, and the respective values of their residuary products. From this article is compiled the following table. Five cubic feet per hour of the gas produced by each description of coal, it must be understood, gives a light equal to the number of candles stated in the first column of figures. The second column shows to what proportion of the cost of the coal the residuary products are equivalent.

	CANDLES.	PER CENT.
Scotch Cannel,	20 to 30	5 to 20
Newcastle Cannel,	22 to 25	30
Wigan Cannel,	20 to 23	20 to 25
Newcastle Coking Coal,	11 to 15	50 to 55
Derbyshire do.	12 to 15	40 to 45
Yorkshire do.	10 to 13	45 to 50
Lancashire do.	10 to 12	45 to 50
Cumberland do.	10 to 12	35 to 40
Gloucestershire do.	10 to 12	30 to 35
Cheshire do.	10 to 12	20 to 25
Somersetshire do.	9 to 10	40 to 45
Staffordshire do.	9 to 10	35 to 40
South Wales and Dean Forest do.	8 to 9	45 to 50

This table may teach the public how fallacious it is to suppose that gas can be sold at the same price, with the same profit, all over the world. The lighting power of the coal—the value of the residuary products—the extent of consumption—must all be taken into consideration. We must also bear in mind that the residuary products of the same coal vary in value according to locality.

The Philadelphians have given a grand fete to Capt. Mathews of the "City of Glasgow."