OCCASIONAL NOTES.

By G. E. H.

LONDON CITY RAILWAYS.

London, July, 1871.

While New Yorkers are arranging themselves either for underground "quick transit," or quick transit overground—warmly discussing the respective merits of Smith's ingenious "combination" of *one* third coal tar to two thirds ashes *versus* Brown's patented proportion of "*two* thirds coal tar and one third ashes," "as described and explained" for the "coming" universal pavement, or anathematizing their jolting horse cars—conservative old London, brushing centuries of dust from her ancient spectacles, is thoroughly testing the many facilities which modern engineering affords for transporting her millions of population, between the limits of her city walls and the immense outlying suburbs, by rail, tram and road.

The "Metropolitan" underground railway has lately extended its southern arm nearly to the portals of the "Old Lady of Threadneedle Street," thus giving still further convenience of rapid and cheap transit for the "city" man of which our "down town" *habitué* of the New York overcrowded tramways, traversing the "blocked" line of Church or Chatham Streets, can form scarcely an idea.

This completion of what may be termed the "inner circle" of railway communication between the suburbs and the heart of the city of London, was duly commemorated by an "official opening," and one of those liberal and magnificent banquets peculiar to "city" feasts, at the Mansion House Station, which was largely attended by many of the prominent and influential members of the parliamentary, civic, social, and engineering world.

The station was tastefully decorated for the occasion, though one could but notice the unfinished condition of the walls through the hangings, which the hasty erection of the building, within three weeks, readily excused.

This last extension of the line from "Blackfriars" has not only been the most expensive, but of a difficult character, unprecedented even in metropolitan railway experience. To the courtesy of the resident engineer we have been often indebted, and, from the facilities afforded by him, are enabled to present a condensed description of the work.

The station itself is principally built under the new "Queen Victoria" street; and as the space under that street had been devoted by the "Board of Works" to the construction of vaults 12 ft. in depth, and two 8 by 8 ft. subways with sewers (of 3 ft. 6 in.) under the subways, the railway works had to be adapted to their conditions.

This was effected by keeping the railway below the vaults and subways, carrying these works on a tier of heavy wrought iron girders, and the street itself on another tier above the subways. As additional to these enormous weights, that of a portion of the buildings to be erected on the southern side of the street will rest on the girders. They are sustained upon massive wrought iron columns, built of square section, under the girders wherever practicable, each column calculated to a breaking weight of 4,000,000 pounds.

Wrought iron columns were adopted in order to lessen the risk of accident should a train leave the metals, though as a further precaution a heavy brick and timber buttress surrounds each column, three feet high.

In extending the railway under the church of St. Nicholas, the process adopted was to sink narrow shafts at intervals in front and under the church wall, and to fill in with solid brick work in cement to a depth of 40 feet and below the railway level. A tall chimney stack on the opposite side, and several immense warehouses, were similarly proceeded with.

At one point, while passing through the old Lutheran chapel burial ground, the soil to a depth of eighteen feet consisted of little else than skulls and bones; while at the eastern end of the station a very perfect pointed arch passage of the 14th century was discovered, twenty feet wide, and quite large enough to swallow up the houses of the unsuspicious inhabitants above.

Within 280 yards from the terminus, 150,000 tuns of earthwork have been carried away, and 50,000 tuns of new material brought on the ground, within three months, by 2,000 workmen employed night and day.

An estimate of passengers for the year 1871 exceeds 65,000,000, which can only be accommodated by the running of 25 to 30 trains per hour. This the "block" telegraph system allows with perfect safety.

The Metropolitan Railways have been constructed under the direction of John Fowler, Engineer-in-chief, ably seconded by Mr. Baker and Mr. Cooper; and to these gentlemen we are indebted for many favors and much information regarding the works.

In the general railway world, the narrow gage system of from 2 ft. 7 in. to 3 ft. 6 in. is promising a revolution in railway practice; and much credit is due Mr. Fairlie for his strenuous advocacy of the 3 feet gage, and the invention of the locomotive, which bears his name, to profitably work the system. Let him have due credit.

Again, after a long rest, has the "Euphrates Valley" route been revived in Parliament, and seems likely to be ordered. This railway, rivaling the Pacific in its capital of $40,000,000, and intended to shorten the route between England and her Indian possessions by 1,000 miles, is to connect the Mediterranean Sea and Persian Gulf by crossing Asia Minor, and linking in its iron chain many of those ancient cities most familiar to our ears from Bible history, or the "Arabian Nights Entertainments."

But "all aboard" for Babylon, and "this way for accommodation train for Bagdad and Bussorah," will soon lose its novelty; and our children traveling "express" in "Pullman" cars past the cradle of human history, Chaldea, Mesopotamia, Nineveh, shall rest themselves on the site of Paradise, and daughters of Eve discuss the latest Paris fashion on the very spot where their mother's curiosity cost them and us so much.

We have just passed through a tramway struggle, in which American conveniences, having assiduously approached the city limits, have recently failed in their attempts to push their way into the crowded retail streets of the West end; and while the English tramway, with its neat grooved rail, sunk flush with the road, giving the minimum of obstruction to passing vehicles, and the rule which forbids carrying more passengers than can be easily accommodated with seats, are model points which should be rendered as imperative in America, yet we agree with the outcry which objects to those "old men of the sea" from establishing a "right of way," such as their New York prototypes have assumed.

The success of the London tramways has brought out companies with aggregate capital of $7,500,000 for extending their beneficies to those cities of the old and new world not yet provided with such luxuries. But this is not to be regarded so much in the light of overwhelming evidence of their advantages as that of the present speculative mania which is capitalizing every thing, from a silver mine in Utah to a bonded warehouse on the Thames.

The battle of the Asphaltes still goes bravely on. The "Val de Travers" or Swiss Company have laid the "Poultry," "Cheapside," "Old Broad," and "Gracechurch" streets; and although, as a rule, the work is well done, yet its surface is not even, and a slight shower renders it so slippery that many horses are thrown.

The "Limmer" Company, last year, laid a heavy traffic street in the "Borough" which has worked admirably, and have lately completed Lombard street with their material, which is procured from the German States. The process of paving with the "Limmer" is simpler, and does not necessitate the employment of "expert" workmen like the Swiss to "lay" a street. The German Company claim, moreover, that the surface is more even, that no mastic is used, no joints are visible, and that it is not slippery in wet weather; and a company has been formed to monopolize all the asphalte mines in Germany, which is to work the mines, and supply the mineral to the "Limmer" and other concerns.

The relief from the noise and roar of the stone pavements is such, that every street in the city is petitioning for asphalte; and that it will be the "coming" pavement, there can be no doubt.

The feeling here in regard to town travel is, that all the city streets should be laid with asphalte, which gives a smooth, noiseless tramway for all vehicles, while the monopolizing rail tramway should only be allowed to run from the suburbs to the verge of the crowded thoroughfares; which, as combining the maximum of general convenience with a minimum of monopoly, is recommended to the earnest attention of the American citizens.

Information regarding Canals.

There having been many inquiries relative to the dimensions, number of locks, etc., of the Erie and Oswego Canals, we append the following table:

DIMENSIONS OF THE ERIE AND OSWEGO CANALS AND THEIR STRUCTURES.

CANALS.

Length of Erie Canal	351·78 miles
Length of Oswego Canal	38 "
Width at surface of water	70 feet.
Width at bottom:	
With Slope Wall, 1 to 1	56 "
With Slope Wall, 1¼ to 1	52½ "
With Bench Wall	42 "
Depth of water	7 "

LOCKS.

No. of Locks on the Erie Canal: Double, 57; Single 15	72
No. of Locks on the Oswego Canal	18
Length of Locks, 110 feet between hollow quoins, admitting the passage of boats 96 feet in length.	
Width at surface of water of lower level	18 feet.
Width on botom	17 feet 4½ inches.

Experiments made in 1848 and 1849, with a single enlarged lock in good repair, and with full attendance, demonstrated that lockages could be made as follows:

For boat to enter lock, snub and shut the gates	1½ minutes.
To open valves and empty the lock	1 "
To open the gates and get the boat out	1½ "
Total average time consumed	4 minutes.

BRIDGES.

Hight in clear above water line	12 feet.

AQUEDUCTS.

Width about	50 feet.

The light weight of first class boats navigating the canals is from 60 to 65 tuns.

By the regulations of the Canal Board, no boat drawing more than six feet of water shall be cleared after the first day of June, 1864, by any collector on the Erie, Oswego, and Cayuga and Seneca Canals; and it is the duty of every collector, superintendent, inspector and weighmaster, to cause every boat found violating the regulation on this subject, to be so far unloaded as to bring it within the prescribed limits; and in every case where a boat is so unloaded, the fact must be entered on her clearance, with a statement of the portion of cargo taken off; and in every case where a boat shall be found drawing more water than six feet, the master or owner is subjected to a penalty of twenty-five dollars, to be imposed and collected by any and every collector, superintendent, inspector and weighmaster, who may at different times and places detect such overdraft, and it is the duty of every collector to enter upon the clearance the draft of water of every boat at the time of such clearance.

No boat or other craft whose hight or distance from the water line exceeds eleven feet and three inches, and no loaded boat or other craft whose cargo, or any part thereof, is so arranged or placed on such boat or craft, that the top or extreme hight of the same exceeds eleven feet and three inches from the water line; and no steamboat, tug or other craft propelled by steam, whose hight, from the top of the deck, machinery, fixtures or other apparatus exceeds eleven feet and three inches, is allowed to navigate the Erie, Oswego, and Cayuga and Seneca Canals.

All boats propelled or drawn by steam, together with the boats in tow thereof, have preference at the locks over other boats and floats, except as otherwise provided by statute.

A Gift to the People of England.

Mr. John Ruskin, author and art amateur, of Denmark Hill, near London, has recently given a sum of five thousand dollars to the public. Of the many thousand admirers of this gentleman's works, there can scarcely be any who will not predict that his donation was announced in terms remarkable for beauty and originality (perhaps eccentricity), with a strong coloring of Utopian imaginative powers. Mr. Ruskin, moreover, hopes to receive contributions for the prosecution of his idea, from other wealthy and generous men. We give the eminent critic's own words, extracted from the last number of his serial work, *Fors Clavigera:*

"I will tell you a little more of what we are to do with this money as it increases. First, let whoever gives us any be clear in their minds that it is a gift. It is not an investment. It is a frank and simple gift to the British people; nothing of it is to come back to the giver. But, also, nothing is to be lost. This money is not to be spent in feeding Woolwich Infants with gunpowder. It is to be spent in dressing the earth and keeping it—in feeding human lips, in clothing human bodies, in kindling human souls. First of all, I say, in dressing the earth. As soon as the fund reaches any sufficient amount, the trustees shall buy with it any kind of land offered them at a just price in Britain. Rock, moor, marsh, or sea-shore—it matters not what, so it be English ground, and secured to us. Then, we will ascertain the absolute best that can be made of every acre. We will first examine what flowers and herbs it naturally bears; every wholesome flower that it will grow shall be sown in its wild places, and every kind of fruit tree that can prosper; and arable and pasture land extended by every expedient of tillage, with humble and simple cottage dwellings under faultless sanitary regulation. Whatever piece of land we begin work upon, we shall treat thoroughly at once, putting unlimited manual labor on it, until we have every foot of it under as strict a care as a flower garden; and the laborers shall be paid sufficient, unchanging wages; and their children educated compulsorily in agricultural schools inland, and naval schools by the sea, the first indispensable condition of such education being that the boys learn either to ride or to sail; the girls to spin, weave and sew, and at a proper age to cook all ordinary food exquisitely; the youth of both sexes to be disciplined daily in the strictest practice of vocal music; and for morality, to be taught gentleness to all brute creatures, finished courtesy to each other, to speak truth with rigid care, and to obey orders with the precision of slaves. Then, as they get older, they are to learn the natural history of the place they live in—to know Latin, boys and girl both—and the history of five cities: Athens, Rome, Venice, Florence and London. Now, to what extent I maybe able to carry this plan into execution I know not; but to some visible extent, with my own single hand, I can and will, if I live."

This is a beautiful picture of an ideal colony, and might be well attempted on a larger scale that even the generous gift of Mr. Ruskin, largely as it may be augmented, will admit. We hope the donor will live to see at least part of the realization of his dream; for all who know him and his books will be sure that it would be the due reward of a man of goodness and genius.

Durable Sensitive Photographic Paper.

At a recent meeting of the Berlin Photographic Society, the President exhibited a specimen of silvered albuminized paper, the advantages of which are here explained.

In six ounces of distilled water is dissolved one ounce of nitrate of silver (free from acid), and in another similar quantity of water one ounce of chemically pure citric acid. When both compounds are completely dissolved in their respective liquids, the latter is poured into the former, the combined solution being well shaken, and subsequently filtered. Finally, one ounce of alcohol is added.

It is quite sufficient if the paper is allowed to float upon the liquid for the space of a minute, or, at any rate, until it swims evenly upon the surface in all parts. Coagulated paper presents more brilliancy, when printed and finished, than that which is not coagulated.

Upon the purity of the citric acid depends the clearness of the bath, for if the acid is at all impure, a grayish precipitate is formed—probably citrate of silver. At the same time, if this precipitate is filtered off, the results obtained are still of a favorable character. The bath will remain perfectly clear and transparent, even after considerable use.

The durability of the sensitive albuminized paper produced in this manner appears to be quite unlimited, for some sheets of the material which were prepared some nine months back are as white and fresh now as when first sensitized.

The advantages entailed by the employment of the citrate-silver bath are not to be despised, for besides the convenience of always having sensitive paper ready at hand, there is obviously less chance of loss from the paper becoming yellow and useless during a lengthened period of unfavorable weather.

Lubricator for Cylinders of Steam Engines.

In the use of tallow or oil in large quantities, more especially tallow, which is often rancid, it is well known that piston heads, followers, and other internal parts of steam engines are more or less corroded, and often are changed into a state resembling plumbago in physical character, from the combination of carbon, from the decomposed grease, with the iron work. The best oils for this purpose are lard, castor, sea-elephant, and walrus oils; but even with these least objectionable lubricating substances, it is very desirable to have some means by which they can be fed economically, uniformly, and sparingly to the interior of the cylinder.

These desiderata are, it is claimed, secured by the use of the invention we illustrate herewith, the essential parts of which are lettered in the engraving as follows:

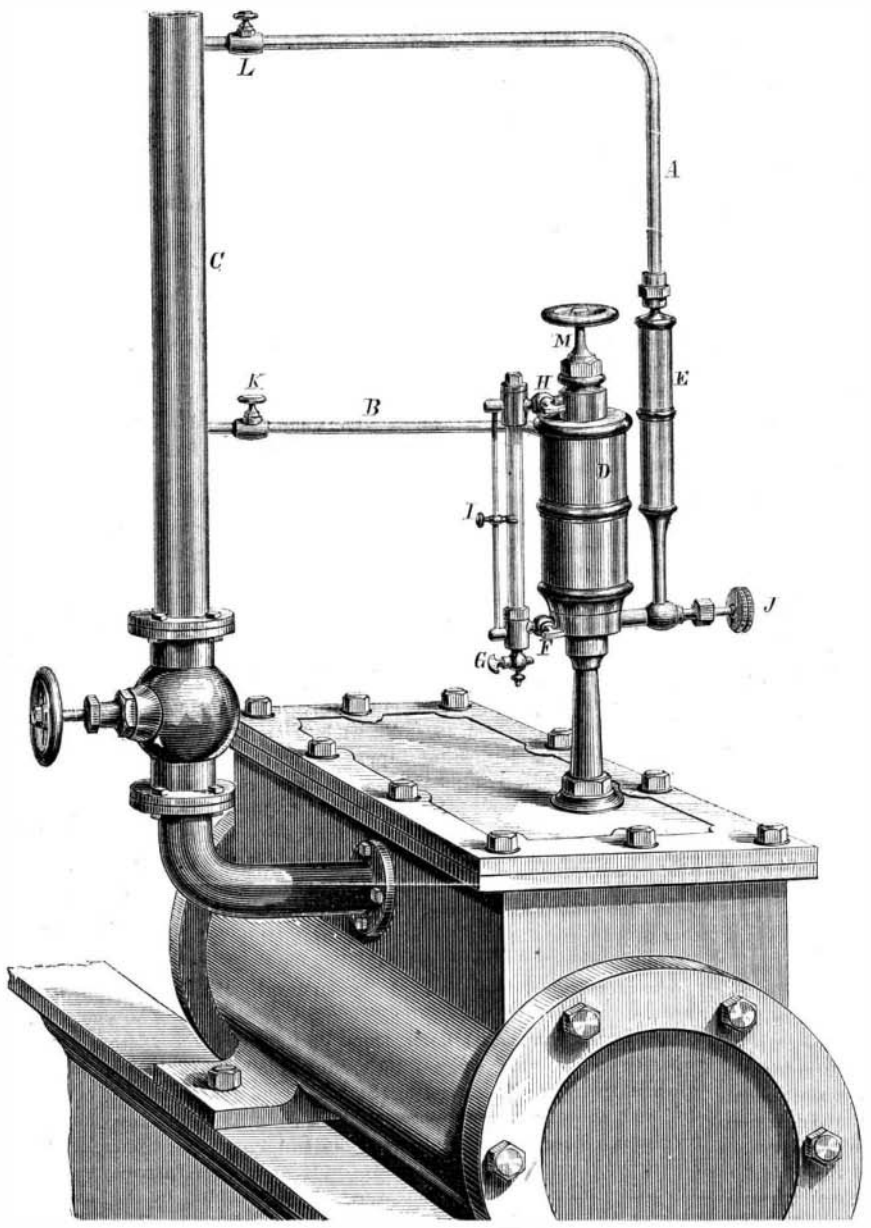
A is the condensing pipe; B the discharge pipe; C the steam pipe from the boiler; D the oil cup; E the reservoir; F a stopcock; G the waste cock used in cleaning the glass tube and removing residuum from the oil cup; H a stopcock; I the sliding gage on the glass tube; J the feed valve; K the valve to shut off the supply of oil when the engine is stopped; L the valve to admit steam into the condensing pipe; and M the valve through which oil is supplied to the cup. There is also a check valve, not shown, on the discharge pipe, B, to prevent steam from entering the cup.

The action of this arrangement is as follows: When the condensing pipe, A, and discharging pipe, B, are connected with the steam pipe, C, the pressure in both the first named pipes is equal; but the condensing pipe has a perpendicular hight above the discharge pipe, and contains a column of water which gives the pressure to force the oil out of the cup, B.

This lubricator is suitable for any engine, either high or low pressure, large or small. In all cases the oil should be discharged in the steam pipe above all the valves. The directions given by the manufacturers for putting up and operating the instrument, are to "stand the cup, where convenient, no matter at what distance from the steam pipe or engine (unless in cold climates, when it is best near the engine). Make the connections as seen in the annexed engraving, as near as circumstances will permit If the steam pipe is copper, punch a small hole—then enlarge it with a tapering punch to receive the tap. The perpendicular pipe on the reservoir, E, must not be less than ten inches above the discharge pipe. and as much higher as may be convenient; when too high, it requires the feed too fine, and when too low, there is not pressure enough to force the oil out of the cup. It takes three inches of water above the check valve to balance it. The best hight is one foot above the reservoir. Care should be taken to make tight joints, as a leak here and there would be enough to oil the engine. The joints where the cup and pipes couple should be sheet lead. If the cup is to be used as soon as put up, fill the reservoir with clean water, also put a little in the cup, enough to show in the glass tube; shut the feed valve to keep the water in the reservoir; put in the oil, and screw down the plug; open the valve to admit steam in the condensing pipe, then start the feed valve, J, a very little, and next the discharge valve, K. It is not necessary to open any of the valves much; the less they are worked the longer the packing will last, and the feed valve need not be open more than just a mere leak. Care must be taken not to feed too fast, as that would force all the water out of the reservoir, E, and it would not work properly; the reservoir and part of the condensing pipe must contain water; feed about one sixteenth of an inch per hour, more or less, by the glass tube. If at any time the oil in the glass tube does not seem to rise, it would indicate that the passage from the glass to the cup was stopped, and should be cleaned out by taking out the cap above the glass tube. Care must be taken, when put back, to hold a wrench in the left hand, against the pressure, while screwing in with the right, so as not to break off the tube arm.

By means of the glass tube the engineer can at all times see just how fast he is consuming oil, and thus is enabled to control the action of the instrument perfectly. The advantages of this method must be so obvious to engineers as to render their enumeration superfluous.

Patented, Feb. 14, 1871, by N. Seibert, whom address, for further information, San Francisco, Cal.



SEIBERT'S LUBRICATOR.

Quiet Ebullition of Liquids.

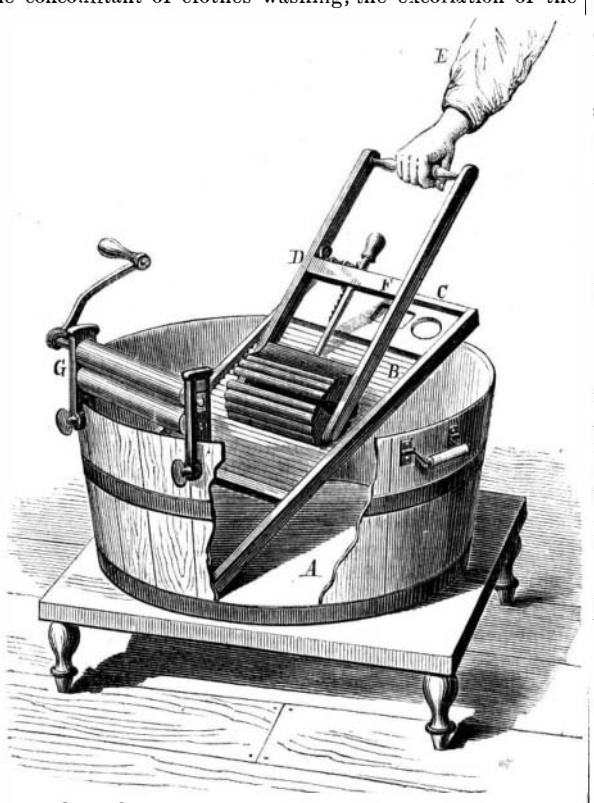
It is of great importance in many analytical and technical processes, that the liquids with which one is operating should boil quietly and with regularity, without that fitfulness and bumping with which all are familiar. It is in this connection that attention is directed to a communication of Th. Schumann, according to which this object may be accomplished in most cases by the following method:

A glass tube about ⅛ inch in diameter is taken; this is melted shut at one end, and bent into the form of a hook, while the other end is left open. The tube, which should be about an inch shorter than the distance from the stopper to the bottom of the retort, is then hung by a string from the tubulure. As the liquid is heated, the air in the tube expanding gives rise to bubbles, which regularly ascend; and when the boiling point is reached, vapor of the tension of the atmosphere is formed at the open end of the tube, and the process of ebullition is carried on for days with regularity and quietness. When an operation is interrupted, or the retort filled with fresh material, it is necessary to remove the tube from the liquid, and then to introduce it afresh.

C. Wilkelhofer recommends for the same object that an artificial generation of gas should be kept up in the liquid during the operation, which he accomplishes by passing a galvanic current through it. The action of one of Bunsen's elements, of ordinary size, is said to be sufficient for the purpose, the wires being of copper or of platinum, as the nature of the boiling liquid may require. It is plain, however, that this plan can have but a limited application in practice.

DUGDALE'S UNIVERSAL CLOTHES WASHER.

This device is calculated to do away with that disagreeable concomitant of clothes washing, the excoriation of the hands through the combined action of the hot alkaline suds and friction. As it also allows much hotter suds to be employed than can be used in ordinary hand rubbing, it reduces the amount of rubbing necessary, and thereby lessens the wear upon the fabric. These advantages are important, and are practically secured by the (if we may so describe it) substitution of artificial for natural hands.



The clothes are held during the process of rubbing between the two ribbed portions of a rubber, which, when brought together by the action of the hand screw, F, hold the clothes securely, and present a rounded contour, between which and the washboard, B, the clothes are rubbed, without the necessity of placing the hands in the suds.

The board, B, is attached to the tub, A, by a screw at C. The frame, D, which carries the rubber, is grasped by the hand in the manner shown at E.

A wringer, G, may be attached to the tub as shown, and then this simple apparatus is complete.

Perhaps an even more important advantage than either of the above named is the avoidance of the danger to health arising from the overheating of the arms and hands, and their sudden exposure to cold in hanging out clothes to dry. This sudden and violent change is a fruitful cause of disease which the employment of the device described would wholly obviate.

Patented through the Scientific American Patent Agency, January 18, 1870, by James Dugdale, who may be addressed for further information, or to whom orders may be sent, at Whitewater, Ind.

The Author's Rage for Titles.

The following remarks from the *Indiana Journal of Medicine*, will apply to authors in general, but more especially to all technical authors, as well as to writers on medical subjects.

"In modern times the Pacha of many tales has given place to the many-tailed Doctor; for if the latter writes a book or an article for publication, he generally appends a long announcement of fellowships, memberships, professorships, and lectureships in various societies and colleges, winding up the tiresome task by writing *etcætera, etcætera*, at the end, as if to imply that he could tell us more if he only would, or had the time and breath. We see no reason why a physician should do this *unless he means it as an advertisement of his specialty*, for it certainly cannot lend any value to a book that the author was Toe-nail Extractor-Extraordinary to His Majesty the King of the Cannibal Islands; nor does it add to the intrinsic merit of the work that it was written by one who is a member of the Society for the Restoration to an Upright Posture of Accidentally Overturned Tumble-bugs.

Testing by means of the Blowpipe.

According to the *Chemical News*, M. F. Jean states that sulphuret of sodium is one of the best blowpipe tests, if used in the following manner:—First, a bead is made with borax and the substance to be tested, and this bead, having been made very fluid within the reduction flame, there is added to it some dry and pulverized polysulphuret of sodium, and the bead again heated in the reduction flame. If the substance under investigation can form a sulpho-acid, there will be formed a soluble sulphosalt and a clear bead; but when no such salt can be formed, with lead, for instance, an opaque bead will be formed. Iron, lead, bismuth, nickel, cobalt, palladium, thallium, silver, copper, uranium, &c., fused in a bead of borax, to which, afterwards, sulphuret of sodium is added, will yield a black or brown colored opaque bead; zinc yields a white opaque bead; cadmium, while yet hot, scarlet red, and yellow after cooling; manganese, a dirty chestnut brown; gold and platinum, a clear, transparent, mahogany brown bead; tin, a clear, transparent, yellowish brown bead; chromium, a green bead; arsenic and antimony, colorless clear beads; vanadium and iridium, blood red beads; a slight excess of the sulphuret of sodium is required, and the bead should be heated carefully, but steadily, and with a good blast in the reduction flame.

Orange Wood.

Mr. George W. Moody, of Waxahachie, Texas, has obligingly sent us a specimen of orange wood, sometimes called *Bois d'arc*. He informs us that it is indigenous to Texas, and is there valued highly for carriage and wagon building. Changes of weather never affect it, and wheels made of it have been in use for ten or fifteen years without needing repair, while other wheels in the same locality require to have the tires shrunk once a year. Vehicles built of this wood command higher prices by thirty per cent than those of ordinary timber. Land with this timber growing on it can be bought for from three to five dollars per acre. The wood yields a beautiful orange dye, for which the sawdust, now valueless, can no doubt be used. Mr. Moody anticipates that, when railroads are extended to his section of the country, one stick of this timber will be of more value than an acre of the land is now.

MR. J. L. DENNEY, of Christiana, Pa., has had struck an artistic medal for patentees. An engraving of the exact size and shape of it may be seen in advertising page. The emblems are appropriate, and the whole design is artistic.