The origin, progress and present state of the various establishments for conducting chemical processes, and other medicinal preparations, at Apothecaries Hall.

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AT

Apothecaries Hall.

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APOTHECARIES HALL,

11*th Nov.* 1823.

THE Committee of Managers of the United Stock of the Society of Apothecaries, have great reason to apprehend that the origin and design of their Establishment for preparing Chemical and other Medicines, is very imperfectly understood, not only by the public at large, but also by those Corporate Bodies, Merchants, Medical Institutions, and private Persons, whether Medical Practitioners or others, who have for so long a period honoured them with their confidence; they have, therefore, considered it a duty incumbent upon them to publish a brief Statement of the first formation of their Laboratories, and of the methods in which their Business has been conducted for about a Century and a half to the present time. To this is

subjoined a description of the late greatly enlarged and much improved state of their Laboratories and Apparatus, both for Chemical and Galenical preparations, by which they are enabled to perform the several processes in a manner which will be attended with increased advantage to the Public, in a corresponding reduction of Prices, and at the same time with an equitable profit to themselves.

THE

ORIGIN,

&c. &c.

From the Charter granted to the Society of Apothecaries by his Majesty King James the First, it appears that about the latter end of the 16th and the beginning of the 17th century, the Metropolis of this kingdom abounded in ignorant and dangerous Empiricks, who, not being regularly educated as Apothecaries, made and compounded many "hurtful, false, and pernicious medicines," the evil effects of which were not confined to the Capital, but were disseminated through most parts of the Kingdom. With a view to remedy these grievances this Society was established in the year 1617, and was empowered to make ordinances concerning Medicines and Compositions, advising respecting the same with the President and Censors of the Royal College of Physicians; also to examine the Shops of

Apothecaries within the City of London, and to the extent of seven miles around it, with a view of ascertaining the qualities of the Drugs and Medicines contained in them, and with power to destroy all "unwholesome and hurtful articles" which they might discover during such examination.

It was soon found that the want of Legislative authority rendered the wise and judicious intentions of this Charter nugatory, with respect to all such Apothecaries who were not members of the Society. Early and repeated applications were therefore made to Parliament for their sanction to confirm and establish the powers contained in it, but for various causes such sanction could not then be obtained; so that the evils, which it was chiefly intended to obviate in the preparation of Medicines, continued to an equal and probably greater extent.

From the records of the Society, it appears, that its Members soon discovered a laudable anxiety to relieve themselves from the necessity of depending for a supply of Medicines on the artifices, and the spurious compositions of the Druggists and Chemists of that time, and accordingly, in the year 1623, they formed a plan for supporting a Dispensary of their own, for compounding the more elaborate Confections, (which containing a great number of Ingredients were more liable to adulteration) by a public dis-

pensation under the inspection and management of a Committee of themselves. The utility of this plan, being probably confined to very few articles, must have been of a very limited extent, and it was not until nearly half a century after, that the design of a public Laboratory for the preparation of Chemical Medicines was set on foot. It originated from the difficulty and great expense which must have been incurred, by the Apothecary, in making his own Chemicals, and from the impracticability of his procuring them elsewhere in a pure and genuine form.

In the year 1671 a Chemical Laboratory was first formed at Apothecaries Hall, by subscription among the members of the Society. When compared with the present very extensive establishment, it must certainly have been upon a small scale, but, no doubt, amply sufficient to answer the purpose for which it was then intended, which was to furnish the individual subscribers, and them only, with such chemical preparations as they might have occasion for in their medical practice as Apothecaries.

How long the sale of Chemicals was confined to subscribers alone, cannot now be known, but the increasing reputation of this Laboratory must have soon caused applications for purchasing them, from persons who were neither subscribers nor Members of the Society, for in 1682, the Com-

mittee of Managers were called upon to consider the propriety of acceding to such applications. Whether it was at that time consented to, or not, does not appear, but it must have taken place within a few years after.

In the early part of the reign of her late Majesty Queen Anne, a new era took place in the affairs of this Society. So much difficulty had arisen in providing pure and genuine Drugs and Medicines for the use of the Royal Navy, and the credit of the Society in their chemical preparations was so fully established, that application was made to them by his Royal Highness Prince George of Denmark, Lord High Admiral, to undertake that service, which was readily consented to, and became the origin of a separate commercial establishment under the title of the Navy Stock.

Until this time Chemical processes only were carried on at their Hall, but as it now became necessary to provide both Drugs and their preparations, as well as the various Galenical Medicines at that period employed, a considerable capital was formed, and Warehouses and Laboratories erected for that purpose. The great expense attending the establishment of this Stock, which, from the extensive erections of such various kinds, became unavoidable, rendered it for the first half century a source of small pecuniary

profit to the Proprietors. It is only subsequently to that period, that the numerous and extended wars in which the nation has been engaged, and the consequent large supplies of Medicines required for the service of the Navy, in addition to the great quantities exported to India, by order of the Honourable East India Company, and the large sums which have been of late years received for Medicines furnished for public institutions, as well as private families, that a profit has accrued by which the Society and its members have been indemnified for the losses and other disadvantages sustained in the infancy of this commercial establishment.

As the concerns of the Society have been at all times conducted with that accuracy, and integrity, which has acquired for the Medicines prepared at Apothecaries Hall the highest character, both throughout this kingdom and in almost every part of the Globe, it will be right to give a general explanation of the manner in which the business is conducted, subjoining a short description of the present improved state of their Laboratories and Apparatus, and also of the several processes carried on in them.

The general management of the affairs of the Society as connected with the preparation of Medicines, is under the immediate superintendance of Committees, who meet four times in the

week, or oftener when required, and some Member of which attends daily, and enters in a Book the processes which he finds carrying on at the time of his visit. These daily attendances are performed by the Members of the Committees in rotation.

The *buying Committee* meets every Tuesday at one in the afternoon, to examine and compare the samples of articles sent in by the Druggists, and to direct their purchase; the articles wanting, and the quantity of each required, being specified upon a list posted up in the Hall for the information of any Merchant or Druggist who may choose to offer Samples to the Committee. At these meetings, the best article being selected and determined upon, the Chairman announces the name of the Vender and the price, and the deputy Chairman enters the order. Where two or more Samples of the same Article are equal in quality but vary in price, the cheapest is purchased; if the price of two or more equally good Samples be the same, and the quantity required considerable, the order is generally divided, or given to that house from which the least has been purchased.

In this way every Drug and other article required for the use of the Society's trade is purchased exclusively by sample.

To ensure the correspondence of the bulk of

the article delivered into stock with that of the sample, a distinct *Committee of Inspection* meets every Friday, for the purpose of comparing the bulk with the sample presented on the preceding Tuesday, and rejecting or receiving it accordingly. It is also an important duty of this Committee to examine samples of all preparations whatever, coming from the Laboratories, previous to their being disposed of in trade; samples, therefore, of all Powders, Tinctures, Chemical and other preparations, are regularly presented at this Committee, and their qualities determined by inspection or experiment, when any faulty articles are rejected or returned for amendment, while those which are approved are entered as such, and ordered into the shops and warehouses.

The immediate business of the Chemical Laboratories, as relates to the Processes, Operations, and Apparatus, are under the controul and inspection of Mr. W. T. Brande, F.R.S. the superintending Chemical Operator; and of the Chemical and Galenical Operators who reside at the Hall; and these Officers constantly attend the Buying and Inspecting Committees, and such other Meetings of the Directors of the Establishment as may require their presence.

If any explanation be necessary of the prices charged by the Society of Apothecaries for their

Medicines, which are in some instances higher than those usually affixed to the same articles, even by respectable Chemists and Druggists, it will be only necessary to observe that the mode in which the business is transacted at Apothecaries Hall puts it out of their power to enter into competition with those persons in that respect for the reasons which follow :

The Society consider it their duty to countenance and support the laudable designs of the Royal College of Physicians by adhering strictly to the directions of their Pharmacopoeia in the preparation of Medicines, both as to the quality of the ingredients and the proportions in which they are employed. Moreover, their practice of purchasing none but select Drugs, separated from those parts which are of a damaged or inferior description, compels them to give proportionably higher prices for them than are given by the wholesale Trader, who either imports his own Drugs, or purchases them in their original packages as imported, which he afterwards garbles and divides according to their respective qualities, and fixes his prices to the different purchasers accordingly.

The medicinal Compositions which are most liable to adulteration, because the less easily detected, are Extracts, Confections, and Tinctures. The ingredients of which these are formed, are

for the most part very expensive, such as, among many others, Opium, Cassia fistula, Castor, Colocynth, Saffron, Benzoin, Guaiacum, Scammony, Cinnamon, Cardamom Seeds, but above all the Cinchona Lancifolia, or Crown Bark, which from the very high price it bears, from the large quantity of it which ought to be employed, and from the many inferior sorts of Bark which may be purchased in some instances for not more than a sixth part of its price, affords a strong temptation to abuse, both in the quantity and quality of the article made use of; a temptation, which the most charitable judgment must suppose, in many cases, too strong to be resisted.

That there are Chemists and Druggists in the Metropolis, from whom genuine Drugs may be purchased, and by whom Medicines are prepared with fidelity, is indisputable, but it may be feared that it is too often far otherwise. The advantage of low prices is a powerful inducement with Medical Practitioners, both in town, and particularly in the country, to purchase inferior Medicines; placing that confidence in the vendor of them, to which, they are perhaps not aware that he is not always entitled, and of the quality of Medicinal Preparations the Practitioner himself is frequently an incompetent judge.

As superior excellence in the condition of the

various materials employed in the preparation of Medicines must be allowed to be of the greatest importance, and as it is a trust so liable to abuse, that it must ever be considered highly confidential, it is respectfully submitted that this advantage cannot be satisfactorily secured by any other method than that which has been constantly pursued by the Society of Apothecaries, namely, having no articles of inferior qualities in their possession, and, as far as is practicable, conducting all their processes within their own Walls, and particularly that of powdering Drugs in their own Mills, by which a fruitful source of fraud must be effectually prevented.

The Society beg leave to subjoin, that after repeated solicitations, they have for a few years past, in addition to the general business carried on at their Hall, opened a Department for the sole purpose of preparing and compounding the Prescriptions of Physicians and others, which from the success which has already attended it, they are well satisfied will prove an acceptable enlargement of a system, the principal object of which, in all its branches, has been to provide the public with pure and genuine Medicines.

Description of the Laboratories and their various Appendages, by William Thomas Brande, F.R.S. and Professor of Chemistry to the Royal Institution.

The principal Laboratory is a brick building about fifty feet square and thirty high, lighted from above, and subdivided by a brick wall into two compartments, the dimensions of the larger one being fifty feet by thirty, and of the smaller fifty feet by twenty. The former may properly be termed the *Chemical Laboratory,* all the open fires and furnaces being situated in it, and all operations requiring intense heat being there conducted. The latter is usually termed the *Still-house,* all distillations and evaporations being performed there, exclusively by steam, which is furnished in a manner afterwards to be described, by a boiler placed in a small building annexed to the main Laboratory.

Immediately connected with the above mentioned building is a Chemical warehouse for such articles as are in immediate consumption in

the Laboratory, above which is a small house for a Clerk, the whole being shut off from the Laboratory by iron doors.

The principal entrance to the Chemical Laboratory is through the *Mortar-room*, which is forty feet long and twenty-two broad, and appropriated to mortars, presses, and generally speaking, to all mechanical operations performed by manual labour. At its eastern extremity is a large drying stove, heated by flues, for the desiccation of those articles which cannot be dried conveniently at temperatures easily obtained by steam. At the west end of this apartment a room twenty-two feet by fifteen is divided off, in which is an apparatus for the production of gas from oil, with which the Hall and its various departments, both externally and internally are lighted. Above the mortar-room is a gallery fitted with shelves for various utensils and apparatus, opening at one end into a room appropriated to the use of the labourers, and at the other, into the *test-room*, a small Laboratory fitted up with the requisite apparatus, for minute and delicate investigations, and in which Chemical tests and other articles requiring peculiar attention and cleanliness are prepared.

Annexed to the gas room is a counting-house, behind which a room twenty-two feet square;

commonly called the *Magnesia-room*, is appropriated to the preparation of that article, and also to the manufacture of the most common saline preparations.

Having thus stated the general arrangement and dimensions of the various buildings connected with or forming part of the Chemical Laboratories, I shall now proceed to a more particular account of them, premising that in a detached building there is a steam engine of eight horse power, which is employed with proper machinery, for grinding, sifting, triturating, pounding, and a variety of other operations, which it is not necessary at present particularly to advert to. There are also connected with the Establishment, suitable warehouses, shops, and all other requisite conveniences for carrying on an extensive trade.

In the construction of the new Laboratory safety is ensured by the whole being fire proof, and it is ventilated by a series of apertures in the roof, which may be opened or closed at pleasure. The main chimney is erected in the centre, and has, opening into it below the pavement of the Laboratory four large flues, one of which enters upon each side of its square base. The shaft is one hundred feet high from the foundation, and is accessible in its interior, from one of the underground flues. The flues of the furnaces which are placed against the walls of the Laboratory are

each supplied with registers, and open into a common channel, which surrounds the building, terminating in the chimney, as already described. Each of the four large flues has also a separate register, which may be more or less closed or opened according to the operations which are going on in the various furnaces connected with it. The furnaces thus arranged are,

1. A subliming apparatus for Benzoic Acid.
2. A furnace for the preparation of Sulphate of Mercury.
3. A high pressure steam boiler.
4. A reverberatory furnace.
5. A sand bath
6. An apparatus for Muriatic Acid.
7. Ditto for Nitric Acid.
8. Ditto for the distillation of Hartshorn.
9. A calcining furnace.

There are also a series of furnaces built against the sides of the main chimney, and communicating directly with it by flues of their own, which, as well as the common openings by which they enter the chimney, are supplied with effectual registers, so that when not in use they may be perfectly closed. Of these furnaces, four are chiefly employed for various sublimations, and fusions; four are retort pots; the third side of the chimney is occupied by a powerful wind furnace; and the fourth by a furnace for the

sublimation of calomel. In this Laboratory there is, moreover, a very copious supply of water, both hot and cold; and an engine-hose and pipe is always attached to the water main, in case of accident by fire, as well as for the purpose of cleansing the pavement. Beneath the building are extensive vaults for fuel, with which there is a direct communication by steps descending in one of the angles of the Laboratory.

The *still-house* contains six stills of various dimensions and constructions, twelve pans or boilers, and a drying stove, all of which are exclusively heated by steam supplied from an eight hundred gallon copper boiler, placed in an annexed building, below the level of the still-house; and the flue of which, passing under the pavement of the Laboratories, enters the main chimney already described.

This boiler is calculated to supply steam under a pressure of an atmosphere and a half, and is fed with hot water by a forcing pump kept in constant operation by the steam engine. It is properly fitted with valves, and pressure and water gages.

The main steam-pipe, after ascending from the boiler, sends off descending branches which ramify under the pavement of the still-house in channels of brick-work, covered by cast iron plates. These send off a steam-pipe, fitted with

a register cock, to each still and boiler, from which there passes off an eduction or condensed water pipe, entering the condensed water main, the ramifications of which accompany the steam main, and deliver their contents into a cistern, whence the boiler is supplied with hot water. A large branch of the steam pipe circulates in five convolutions at the bottom of the drying stove, so as to heat a current of air which is made to pass through it; and another branch rising perpendicularly through the pavement, is properly fitted with cocks and screws for the occasional attachment of leaden or other pipes, for boiling down liquids in moveable pans and vessels.

In this building, one of the stills is of a distinct construction, and heated by high pressure steam, supplied from the boiler already mentioned in the description of the Laboratory. Another still, together with its condensing pipe, is composed entirely of earthenware. The former is chiefly used for the first distillation of sulphuric ether, and the latter for that of spirit of nitric ether. The stills and vessels are generally heated by the circulation of steam upon their exterior, but sometimes serpentine pipes traversing the liquor are employed.

In the still house all spirits and waters are distilled; extracts and plasters are prepared;

and all operations are carried on which involve risk by fire, or in which damage is likely to occur from excess of heat.

The *Magnesia room* contains proper vats and boilers for the production and evaporation of saline solutions; the apparatus for the precipitation of carbonate of Magnesia; and a series of vessels for saturating alkalies with Carbonic acid.

In the above outline it has been my object to shew that no labour or expense has been spared to render the Chemical Laboratories complete, and that all the important modern improvements in their construction have been adopted upon an extensive scale, rather than to enter into any particulars respecting the arrangement and dimensions of the vessels, furnaces, and apparatus which they contain. These details will be found in the description of the annexed Plate representing the ground plan of the Laboratories.

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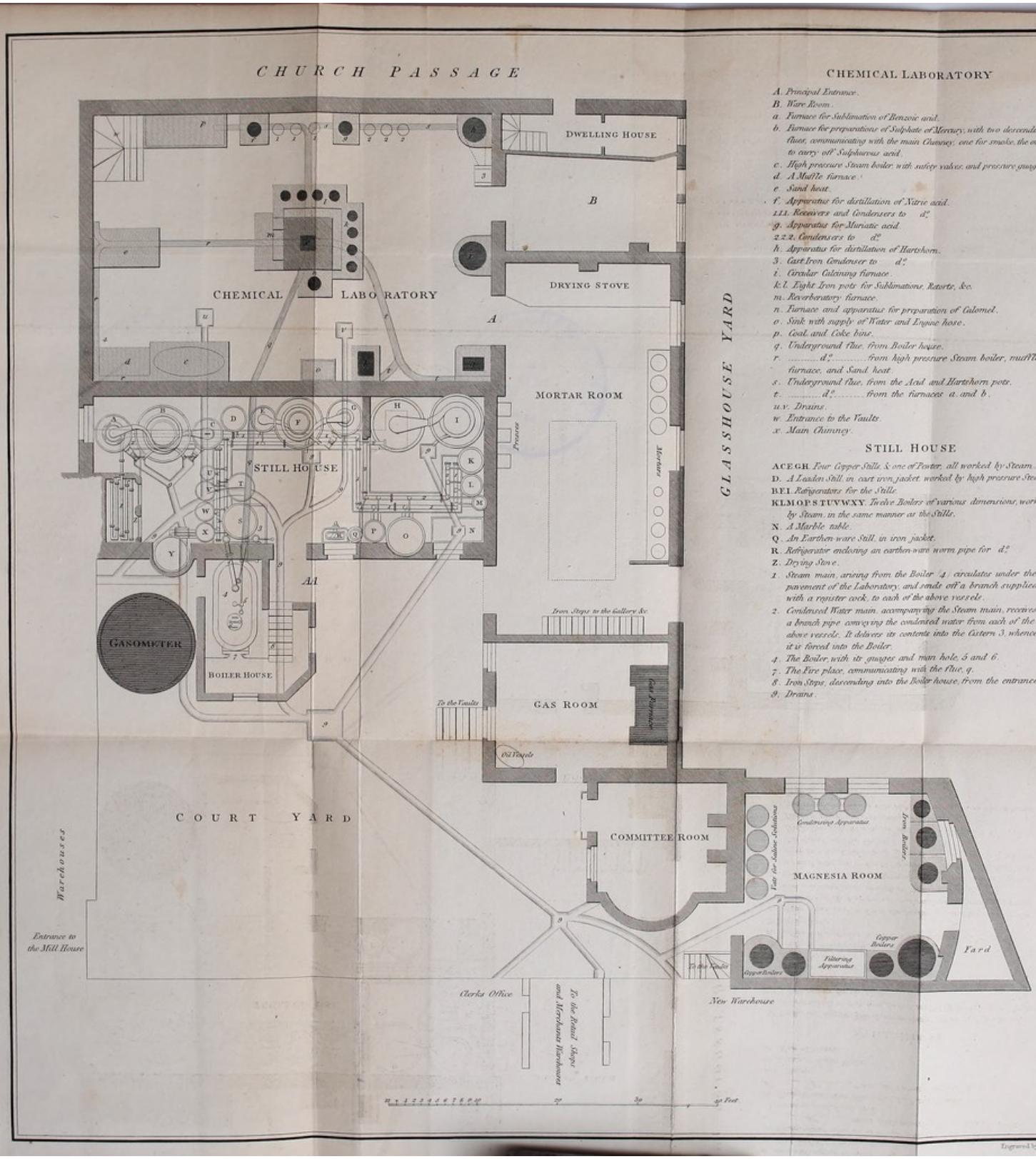

CHEMICAL LABORATORY

A. Principal Entrance.
B. Ware Room.
a. Furnace for Sublimation of Benzoic acid.
b. Furnace for preparations of Sulphate of Mercury, with two descending flues, communicating with the main Chimney, one for smoke, the other to carry off Sulphurous acid.
c. High pressure Steam boiler with safety valves and pressure gauge.
d. A Muffle furnace.
e. Sand heat.
f. Apparatus for distillation of Nitric acid.
111. Receivers and Condensers to d°.
g. Apparatus for Muriatic acid.
222. Condensers to d°.
h. Apparatus for distillation of Hartshorn.
3. Cast Iron Condenser to d°.
i. Circular Calcining furnace.
k.l. Eight Iron pots for Sublimations, Retorts, &c.
m. Reverberatory furnace.
n. Furnace and apparatus for preparation of Calomel.
o. Sink with supply of Water and Engine hose.
p. Coal and Coke bins.
q. Underground flue, from Boiler house.
r. ..... d°..... from high pressure Steam boiler, muffle furnace, and Sand heat.
s. Underground flue, from the Acid and Hartshorn pots.
t. ..... d°..... from the furnaces *a.* and *b.*
u.v. Drains.
w. Entrance to the Vaults.
x. Main Chimney.

STILL HOUSE

ACEGH. *Four Copper Stills, & one of Pewter, all worked by Steam.*
D. *A Leaden Still, in cast iron jacket, worked by high pressure Steam.*
BFI. *Refrigerators for the Stills.*
KLMOPSTUVWXY. *Twelve Boilers of various dimensions, worked by Steam, in the same manner as the Stills.*
N. *A Marble table.*
Q. *An Earthen-ware Still, in iron jacket.*
R. *Refrigerator enclosing an earthen-ware worm pipe for* d°
Z. *Drying Stove.*
1. Steam main, arising from the Boiler *4.* circulates under the pavement of the Laboratory, and sends off a branch supplied with a register cock, to each of the above vessels.
2. Condensed Water main, accompanying the Steam main, receives a branch pipe conveying the condensed water from each of the above vessels. It delivers its contents into the Cistern *3*, whence it is forced into the Boiler.
4. The Boiler, with its gauges and man hole, *5* and *6*.
7. The Fire place, communicating with the flue, *q*.
8. Iron Steps, descending into the Boiler house, from the entrance *AA*.
9. Drains.

Engraved by James Basire.

R C H P A