

peculiar form of chamber shewn in the drawing, nor to the precise arrangement or form of the several parts which have been described; this part of the invention being the addition of an air chamber to locomotive and other boilers, for the purposes above described."

BRITANNICUS.

Observations, Economical and Sanitary, on the employment of Chemical Light for Artificial Illumination. By Dr. E. FRANKLAND.*

Until the commencement of the present century, artificial light was derived almost exclusively from the animal kingdom; but the great economy attending its immediate production from our vast stores of vegetable fuel is becoming more and more apparent, and is in fact so generally admitted as to render more than a mere allusion to it and a glance at the following Table, unnecessary.—

Table, showing the comparative cost of light from various sources, each equal to 20 sperm candles burning 120 grains per hour each, for 10 hours.

	<i>s.</i>	<i>d.</i>
Wax,	7	2½
Spermaceti,	6	8
Tallow,	2	8
Sperm Oil (Carcel's Lamp),	1	10
London Gases, B, C, D, E,†	0	4¼
Manchester Gas,	0	3
London Gas, E,	0	2¼

Notwithstanding the great economy and convenience attending the use of gas, and in a sanitary point of view, the high position which, as an illuminating agent, coal gas of proper composition occupies, its use in dwelling houses is still extensively objected to. The objections are partly well founded and partly groundless. As is evident from the foregoing table, even the worst London gases produce, for a given amount of light, less carbonic acid and heat than either lamps or candles. But then, where gas is used, the consumer is never satisfied with a light equal in brilliancy only to that of lamps or candles, and consequently, when three or four times the amount of light is produced from a gas of bad composition, the heat and atmospheric deterioration greatly exceed the corresponding effects produced by the other means of illumination. By using a gas, however, of nearly the normal composition, such as the hydrocarbon gases above named, it is evident that three or four times the light may be employed, with the production of no greater heat or atmospheric deterioration than that caused by wax candles or the best constructed oil lamps. But there is nevertheless a real objection to the employment of gas-light in apartments, founded upon the production of sulphurous acid during its combustion: this sulphurous acid is derived from bisulphuret of carbon,

* From the London Athenæum, June, 1853.

† London Gases, A, B, C, D, E.—These are the gases furnished to consumers by five of the principal London Companies. For obvious reasons the names of the Companies are not mentioned.

and the organic sulphur compounds, which have already been referred to as incapable of removal from the gas by the present methods of purification. The formation of sulphurous acid can readily be proved, and even its amount estimated, by passing the products of combustion of a jet of gas through a small Liebig's condenser; the condensed product being heated to boiling with the addition of a few drops of nitric acid, and then treated with solution of chloride of barium, yields a white precipitate of sulphate of barytes, if any sulphur compound be present in the gas. These impurities, which are encountered in almost all coal gas now used, are the principal if not the only source of the unpleasant symptoms experienced by many sensitive persons in rooms lighted with gas. It is also owing to the sulphurous acid generated during the combustion of these impurities that the use of gas is found to injure the bindings of books, and impair or destroy the delicate colors of tapestry. Therefore the production of gas free from these noxious sulphur compounds is at the present moment a problem of the highest importance to the gas manufacturer, and one which demands his earnest attention. As it is nearly impossible for the consumer to procure gas free from these objectionable compounds, the only method of obviating their unpleasant and noxious effects is to remove entirely the products of combustion from the apartments in which the gas is consumed, and thus prevent them from mingling with the circumambient air. This suggestion was first made by Faraday, who, accomplishing this object, contrived the very beautiful and effective ventilating burner (in operation upon the lecture table). This apparatus, which is used at Buckingham Palace, Windsor Castle, the House of Peers, and in many public buildings, may be truly said to have brought gas illumination to perfection; for not only are all the products of combustion conveyed at once into the open air, but nearly the whole of the heat is in like manner prevented from communicating itself to the atmosphere of the room. The only obstacles to the universal adoption of this description of burner are, its expense, and the difficulty of conveying the ventilating tube safely into the nearest flue without injuring the architectural appearance of the room. The public at large will, therefore, await the removal of the objectionable compounds in question by the gas manufacturer, before they will universally adopt this otherwise delightful means of artificial illumination.—*Proc. Roy. Inst., May 20, 1853.*

The allegation that the present method of gas purification will not remove all the sulphur, is certainly erroneous. We have seldom been able to find a trace of sulphur, either in the gas of our City, or in its products of combustion. The test alluded to, unless carried much farther, would not distinguish the sulphuric from carbonic acid. ED.

*A Suggestion in Gas Lighting.**

Every one who has had experience of rooms lighted with gas must be aware of the great heat produced by its combustion, and of the effect it has in diminishing the purity of the air, and therefore rendering it less

*From the London Builder, June, 1853.