

## CHAPTER VIII.

KILN SMOKE, OVEN SMOKE, AND NOXIOUS  
VAPOURS.

**Open Kilns.**—There are still a large number of open kilns in use, surrounded by dwelling-houses. They are neither costly nor complex in construction; each consists of a brick building varying from 20 feet long by 15 feet wide and 12 feet high, open at the top, and provided with about twenty firing holes about a foot from the bottom. When the kiln is charged with bricks a layer of coal dust is put on at the top, and the fires, which are open ones, are lit at the bottom. The smoke works its way between the wet bricks at the bottom of the kiln until it forces itself out at the top and volumes of dense black smoke are sent off continuously for three or four hours, until sufficient heat has been generated in the kiln to consume it. This cannot be prevented, and is repeated every time the kiln is relit with a fresh charge of bricks.

**Temporary Kilns.**—There are a number of kilns put up to work for periods of one to three years. A field is purchased for building purposes, and millions of common bricks are required for inside work. A kiln is therefore erected, the clay from the excavations is made into bricks, and burnt in the kiln and so a nuisance is created. Invariably such kilns are in close proximity to dwelling-houses, the inhabitants of which complain, but are told that the nuisance from open kilns cannot be cured, and must be endured.

**Permanent Kilns.**—If these kilns are required to be permanent the Local Authorities seldom interfere. In one

case a desire to do something was evinced as a result of public pressure. A brick company had worked out their clay with open kilns in a moderately populated district, and had been a nuisance for twenty years. They then purchased land in the centre of a densely populated district, put up a big open kiln, and commenced brick making and burning. The people in the district were so indignant at this infliction that they sent a petition to the Local Authority, with threats, if action were not taken to end the nuisance. The Local Authority asked the company to replace the open kiln with a modern smokeless kiln, to which the company replied "that the clay was of such a peculiar nature that it would take them four or five years to work up the clay to make sufficient room for a continuous kiln, and even if they put one down at a great cost they would not have sufficient trade to keep it going." The nuisance went on year after year, the Local Authority took no further action, and the people were almost smothered with smoke.

An improved barrel, up and down draught, continuous kiln, the patent of Sercombe & Co., Leicester, has been devised to prevent smoke. In the single system there are from three to seven chambers, and in the double system there are from seven to sixteen. The draught is a continuous one through all the chambers, produced by a tall chimney taking off the fumes and products of combustion, and securing a uniform heat. The fires are accessible, under control, are lightly fed with coal dust, and perfect combustion is the result. This class of kiln is very popular, and the makers claim a saving of 80 per cent. of coal compared with that used in kilns of other patterns such as round kilns, Scotch kilns and clamps, or open kilns. In these continuous kilns the burning, the drawing, and the filling go on at the same time, which makes the kiln far superior in every way to the old-fashioned types, which have to be lit up before, and let out after, every burning and cause a quantity of smoke for

hours after lighting up. This kind of kiln has practically solved the smoke question as far as the burning of bricks and other material are concerned. There are now hundreds of kilns working of the class named, which are not only practically smokeless, but turn out more and better work in a given time. This is a positive proof that the emission of volumes of smoke for hours together in the burning of bricks, etc., is quite unnecessary. In Sheffield, by putting pressure upon the owners of kilns, the old kilns have in a number of instances been abolished and the modern kiln substituted, with remarkable results, especially from a smoke abatement point of view.

**Potters Kilns and Ovens.**—The smoke nuisance in the Potteries is caused chiefly by enamel kilns, fritt kilns, drying kilns, biscuit and glost ovens, and stove pots. The kiln of the ordinary type, for fixing the enamel colours and over-glaze decorations, is practically a large muffle furnace constructed of fireclay quarries jointed with fireclay, with furnaces at the side.

Fritt kilns are somewhat similar to the tank furnaces used for melting glass, in fact the process of fritting is really the manufacture of glass which, in a vitrified condition, is discharged into cold water, which causes it to break up so that it may be more readily handled.

Drying kilns are tanks of fireclay, fixed over fireplaces in which the moisture contained in such materials as are ground wet, is evaporated by heat.

The ordinary up-draught oven in which biscuit and glost firing is performed consists generally of a firebrick cylindrical box with an air-chamber between the inner and outer walls to prevent loss of heat. Up to nine or more separate furnaces or mouths are built into the oven, each having a separated flue or bag through which the flame passes in an upward direction. Horizontal flues are provided also under the floor and terminate in the centre of the structure, so that a portion of flame can be

diverted to the centre of the contents. The arrangements of the saggars or boxes containing the ware provide for further distribution of the hot gases, which, after reaching the crown of the oven, pass into the hovel and thence out into the open air. In the down-draught oven the openings in the crown are made up and the gases are drawn off through apertures in the floor by a flue usually communicating with a chimney. When the oven is charged the fires are lighted and a little heat is maintained for some time to drive off the moisture present in the contents and afterwards the temperature is raised.

Potters' kilns and ovens, coal fired, do produce and pour into the atmosphere dense volumes of black smoke. Nearly 20 years ago an attempt was made to destroy the smoke demon in America, on the Continent, and in the potteries, by converting coal-fired kilns and ovens into gas-fired, and the experiment was singularly successful in the abolition of the smoke fiend, and in a great saving of fuel.

Producer gas, or town gas was proved to be suitable for the various kinds of kilns and ovens. In spite of the most definite demonstrations, nearly 20 years ago, that it was practicable and profitable from every point of view to prevent the smoke nuisance from kilns and ovens in the potteries, the nuisance is, if not so bad to-day as ever it was, a disgrace to twentieth century civilisation.

If the coal-fired kilns are not constructed so as to consume, as far as practicable, the combustibles used therein, then they should be so constructed forthwith, and all necessary care used in the firing of them, or the better and more satisfactorily gas firing should be substituted for coal firings.

**Coke Ovens.**—Much damage has been done to crops by smoke and fumes from coke ovens. An action was heard in which a farmer sued a colliery company for damage done to his crops by the smoke and fumes from coke ovens. It was claimed on behalf of the colliery company

that, whilst it was possible that the colliery had to some extent contributed to the damage, no nuisance had been committed as they were carrying out the ordinary trade of the district and that moreover what damage had been committed was not entirely attributable to them, as the railway was much nearer the field than the colliery. A verdict for plaintiff for £8 4s. 0d. with costs was, however, recorded.

The antiquated oven for making coke by which huge volumes of smoke were discharged at a very low level is being rapidly superseded by the most modern up-to-date by-product coke ovens which are practically smokeless. Even the old bee-hive coke oven, for which has been claimed a superior class of coke, is giving place to more modern ovens which are smokeless, and more economical.

**By-Product Coke Ovens** are becoming very popular all over the country. The cost of installation is heavy, but in a few years the revenue from the by-products alone is sufficient to repay the capital outlay, and they are the complete cure for the coke oven smoke nuisance for the fumes emitted from the brick chimney (120 feet high) can scarcely be seen owing to their thinness.

The Public Health Act, 1875, *Section 91* covers all kinds of kilns and ovens, and empowers Local Authorities to take action procuring magistrates' orders, demanding the abolition of kilns, or ovens, that are a nuisance, and the adoption of those that are not. If administrative authorities who are invariably too tolerant to smoke makers, would point out how profitable it would be to abolish the old coal-wasting kilns and put in the improved smokeless kilns, it would in all probability lead to action.

If the prospective profits will not induce them to abolish the nuisance, then it becomes the duty of the Authorities to carry out the law and compel them to adopt (for the good of the public, as well as themselves)

the most improved and scientific system available for the prevention of unnecessary annoyance and damage.

**Noxious Vapours Abatement.**—Noxious vapours are from blood boiling, bone boiling, soap boiling, tripe boiling, tallow melting, fellmongering and other offensive trades. Consent in writing must be obtained from the Local Authority in order to carry on such a trade, and any person establishing an offensive trade without consent is liable to a penalty of £50 and £2 per day for every day on which the offence is continued (Public Health Act, 1875). Everything that is practicable must be done to abate the Noxious Vapour Nuisance, or prevent or counteract such effluvia, or the person so offending (being the owner or occupier of the premises, or foreman or other person employed by the owner), shall be liable to a penalty not exceeding £5 nor less than forty shillings, and on a second or subsequent conviction to a penalty of double the amount of that imposed for the last preceding conviction, but the highest amount of such penalty shall not in any case exceed the sum of £200.

**Noxious Vapours from a Digester.**—The Sheffield Local Authority received complaints of a noxious vapour nuisance arising from Bone Mills in the district 10 years ago. The Digester was an iron one, vertical, about 20 feet long and 6 feet in diameter. It was filled with bones, which were subjected to steam treatment at about forty pounds pressure for about four hours. Then from the top of the Digester the steam, and animal matter were discharged into the atmosphere, and the matter was the subject of complaint from people living and working within a mile of the bone mills. On the suggestion of the writer, the steam, after it had done its work in the Digester, was conveyed by a metal pipe to the Lancashire boiler, discharged into the ashpits, passed through the fires and into the boiler chimney about 80 feet high.

There has been no complaint of the nuisance since the alteration was made.

**Offensive Smells from Hay Cooking.**—Complaints were made of offensive smells from the cooking of old and inferior hay by steam in a vertical boiler. After a few hours cooking the steam was discharged at the top of the boiler into the atmosphere. The nuisance was satisfactorily abated by discharging the steam into the river which was near to the works.

**Boiling Animal Matter.**—Noxious fumes were discharged into the atmosphere from the boiling of animal matter. Hoods were put over the vessels in which the animal matter was boiled, the vapours collected, and discharged from a pipe (at a low level) into the atmosphere.

To remedy the nuisance the pipe connected to the hoods was carried to the front of the fire which was underneath one of the vessels and the vapours were discharged over the fire, and emitted from the chimney at a moderate height with the fumes from the fire. This method of destroying noxious vapours removed all cause for complaint.

**Metal Foundry.**—The works of a company were surrounded by dwelling-houses and the Local Authority received complaints, from people living in the locality, of a nuisance arising from noxious fumes when the melting and casting of brass and other metals was in operation. The chimneys which served the melting furnaces were raised to a reasonable height (the furnace fuel was coke), other suggestions to minimise the nuisance were carried out, and everything that was practicable was done, as required by the Public Health Act, to abate the nuisance without stopping the works. After this had been done the nuisance remained unabated, the fumes emitted caused a smarting of the eyes, dryness, and irritation of the throat, and one of the complainants stated that it spoiled the fodder so that his horses would not eat it.

He entered an action under common law in the High Court Chancery Division for an injunction, July, 1918. His evidence was corroborated by the Analyst for the City of Sheffield and other witnesses who lived in the district.

The Managing Director of the company said they had done everything that was practicable to abate the nuisance, and the writer stated in his evidence that the company had carried out the requirements of the Public Health Act, 1875.

A leading metallurgist on behalf of the company, said, "It was impossible for the company to do more than they had done to abate the nuisance, without putting out the furnaces, and the fumes emitted were not poisonous." The judge said, "If the fumes emitted from the said works were not poisonous, they were most irritating and offensive, the plaintiff had suffered from the nuisance longer than was reasonable and he should grant an injunction to become operative at the end of the war, but not before, owing to the fact that the firm was engaged on war work." The company appealed against the decision, but the appeal was dismissed and the company had to discontinue their business in that district.