SESSION 1910–1911

President: Sir David Gill, K.C.B., F.R.S., etc.

# Visit to the Works of the Dermatine Company, Limited

*On Friday evening, October* 21, 1910.

On Friday, October 21, a visit was paid to the works of the Dermatine Company, Limited. The works are in the district of Camberwell, London, S.E. Crossing the Tower Bridge, a bus drive of half an hour brought us to within a few minutes' walk of our destination. Upon entering the factory after leaving the office premises, the manufacture of belting was shown in its various stages. The material is rolled to the required thickness and width, the edges and body are then stitched with several rows of good strong thread to prevent lamination. Belts are all guaranteed as made from absolutely new material as a base, no old or secondhand ingredients being used in the process. Incorporated with the Dermatine is the best long staple flax for the warp and the strongest cotton duck for the weft in the manufacture of the belting, which is adapted for all kinds of works and climates.

The moulding shop next claimed attention, and here was seen the process of making the special valves for air, circulating and other pumps, both for the ordinary style and for the valves fitted with patent anchor bushes, the object of which is to strengthen the valve at the stud hole, thus tending to its preservation, otherwise the flexible valve, of whatever material, is liable to split. The different kinds of work for which valves are required have been studied and experimented with here, and the features of each noted with a view to supply the most suitable valve for each. The

curved lift valve is advocated in preference to the direct lift one, as the liquid in the former case flows with greater freedom, causing less disturbance of the current. Valve seatings, buffers, ball valves, Perreaux valves, bucket rings and Dermatine facings as inserts for metal valves and other samples and specimens are made, moulded and cured to the required hardness or toughness for the special purpose to be served by each, a process necessitating careful attention.

Our guides next led into the department for the manufacture of Dermatine hose. This, like the belting shop, is of considerable length, and contains the vulcanizing pan, over 60 feet. long; and the tray, when drawn therefrom, adds another 60 ft. to its length. The hose is made upon 60 ft. standard mandrels. A solid layer of Dermatine covering the mandrel is the first operation, and this layer forms the inside lining of the hose. Plies of treated canvas are then pressed on with hand rollers until the hose has reached the required strength. Another layer of solid Dermatine is then added as the covering. It is now bound tightly round with cloth of fine texture and placed in the tray of the vulcanizer. When the tray is full it is run in on a tramway and the contents vulcanized. After this process the binding cloth is unwrapped; the hose is removed from the mandrel by means of compressed air, and is ready for use.

Dermatine hose is made for several special purposes, such as withstanding the action of sea water, sewage, steam, and for conveying liquids either under pressure or suction. A considerable quantity of suction hose of 6 in. and 12 in. inside diameter was supplied in January, 1908, for raising the ill-fated steamship *Principessa Iolanda*, which sank in the Bay of Naples during the launching ceremony in December, 1907. Dermatine is much used in the form of solid tubing for conveying acids, alkalies, etc., and among other goods made by the Company are packings, jointing rings for manhole doors, hydraulic ram rings and pump cups, gauge glass rings, hat packings, canvas hose lined with Dermatine, trolley wheels, carriage tyres and brake blocks. An article of special interest was a pneumatic ear pad for use with the latest type of loud-speaking naval telephone.

Hearty votes of thanks were accorded to the Company and to Messrs. H. Higgs and J. Hannay, under whose guidance the various departments were visited.

# Demonstration with the "Dalmar" Tube Cleaner and the Grille Water Tube Boiler

*On Saturday afternoon, October* 29, 1910.

On Saturday, October 29, a number of Members visited the works of Messrs. Fraser & Fraser, Ltd., Bromley-by-Bow, where demonstrations were given with the "Dalmar" Patent Tube Cleaner and the Grille Water Tube Boiler.

The main feature of the Tube Cleaner consists in the special form of nozzle, on the external surface of which are three spiral wings forming screw threads with a tangential angle of about 35°. The three projecting wings form, when the cleaner is fitted into the end of the smoke tube of a boiler, a second passage for the admission of air, which is given a gyrating motion similar to that of a projectile from a rifled cannon. The cleaner was connected by a hose to the boiler, the operator directed it into the end of one of the tubes, and on pressing the handle of the cleaner, a pressure of steam, to which a scouring action was given by the rifled nozzle, was projected through the tube ; the steam being cut off by withdrawing the pressure on the handle. For use at sea a special cut-off device is fitted next to the handle and worked by the handle, to open or close the steam outlet. By this arrangement, the operator can more easily shut off the steam when changing from one tube to another. This device also avoids the waste of steam, and allows it to give very short intermittent blows of different power, the outlet being regulated instantaneously according to the requirements of the situation. Demonstrations were given with both types of the cleaner. It was stated that a marine boiler with 150 tubes could be cleaned in less than eight minutes, and the work could be done at sea or when the boiler was under pressure.

The Grille water-tube boiler of about 200 h.p. was then examined. The boiler is constructed on the sectional principle, in order to facilitate the frequent cleaning down to prevent the formation of scale. Each section consists of a drum,

connected by clusters of U-shaped tubes, which are expanded into separate steam headers at the top of the drum and into water headers at the bottom. The water header is controlled by means of a blow-off cock, and by closing a valve between the water drum and the lower header, the supply of water is cut off from that particular section, the blow-off cock is opened and reverse circulation is immediately set up by the pressure of steam, which blows the water out of the tubes, the steam at the same time scouring and removing any deposit that may be therein. By this means the objection to bent tubes is overcome, and the life of the tube is prolonged as the formation of scale is prevented. The principal feature of the Grille boiler is the system of cartridges or plugs placed in the ends of the tubes attached to the lower headers, and by which the amount of water admitted is restricted to that required for effective evaporation. By thus limiting the supply of water a higher rate of evaporation is secured than in boilers which have the tubes logged with water. The diameter of the opening of this plug through which the water passes is only $\frac{1}{4}$ in., and in case of a rupture, instead of water being discharged from the full volume of the tube, as in the case of the usual type of boiler, it would only be discharged through the small opening. It is therefore claimed that the risk of stokers being scalded is non-existent with this type of boiler. Another advantage claimed is that the steam is perfectly dry when it enters the drum. The water passing along the tubes is gradually turned into steam, which enters the drum above the water level. In the higher parts of the tubes some superheating probably occurs, and from tests it has been ascertained that whatever moisture may be carried with the steam is effectually separated therefrom by the steam impinging against the face of the header as it issues from the tubes. After explaining the construction of the boiler, demonstrations were given by Mr. J. Hall showing the method of blowing down sectionally, and also of the effects of a ruptured tube.

# Visit to the Warehouses of the Port of London Authority, London Docks

*On Saturday, December* 10, 1910.

On Saturday afternoon, an interesting visit was paid to the warehouses of the Port of London Authority at the London Docks.

The first department visited was the ivory floor, an extensive room in which were collected a large number of tusks, arranged and displayed according to size, quality of ivory, etc. In this room the sales of ivory are effected, merchants coming from all parts of the world to make their purchases. The best quality of ivory is obtained from African elephants, and three large tusks were shown which were estimated to produce about £100 each. The extent of the traffic could be conjectured from the fact that three rows of tusks, forming a small portion of the display, was valued at about £5,000. In addition to the tusks of all sizes and qualities, from African, Abyssinian and Indian elephants, peculiarities in ivory were shown, such as the long, spear-like horn of the narwhal, and relics of a former age in the tusk of a mastodon found in the wilds of Siberia, and the enormous ribs of a prehistoric animal unearthed in Central Africa. Immediately above the ivory floor is the bark warehouse, where is stored an immense quantity of Peruvian and other barks used in the making of quinine and for other medicinal purpose. Samples of the various kinds were shown, and the visitors afterwards proceeded to the spice rooms, the proximity of which was indicated by the mixture of aromas from the quantities of spices stored therein. Cinnamon, mace, cloves, pimento, nutmeg, cassia, cayenne pepper, and chillies are among the aromatic and pungent condiments here collected, and although in great profusion, the system of warehousing is such that the position of any particular cargo can be ascertained in a few minutes. At the further end of the building is the wool warehouse, of which a brief inspection was made.

The wine vaults were then visited, each visitor, previous

to entering the vaults, being furnished with an oil lamp fixed at the end of a piece of wood numbered lest a visitor should be lost or strayed. The vaults are of very large extent, the "ways" along which the barrels are laid having a total length of 27¼ miles. The building dates from the beginning of last century, and, seen in the dim gaslight, the forest of arched granite pillars, with growths of fungus shading from snow-white to a deep brown, is not without beauty. Only port and sherry are stored in these particular vaults, which are kept at a constant temperature of 60° F.

The visitors were then conducted to the museum, where were seen various kinds of gums, essential oils and wax, varieties of poisonous herbs, specimens of metals and woods, together with a number of interesting curios. In another department an explanation was given of the use of the instruments for gauging the contents of the wine barrels, and for testing the proportion of spirits.

The thanks of those who were privileged to attend are accorded to the Port of London Authority for the invitation which was tendered to the members who were present at the ordinary meetings of the Institute held on Nov. 28th and Dec. 5th.