SOME CURIOUS OLD BOTTLES.

THE BOTTLE-MAKER OF THE PAST AND HIS CRAFT.

BY THOMAS OXLEY.

ALONG with almost every article of everyday use, the common wine bottle of to-day has its history and development, resulting in the cylindrical bottle as we now know and use it. It is interesting to study the various shapes and forms into which it has been fashioned, not only on account of its utility as a receptacle for wine and other liquors, but also as affording a very

DATED AND STAMPED WITH MERCHANT'S NAME.

considerable amount of information on the use and manufacture of British dark glassware. The wines sent into England from the Continent of Europe come, and always have done so, in bulk, i.e., in the cask, which necessitates the bottle being provided by the merchant to retail the wine to the users and consumers, and as the cost of the bottle has to be included in the price of the liquor, it follows that it must be produced at a low price. Obviously a home-made article produced on or near the spot would be used in preference to a foreign-made article, on which cost of transit would have to be put, and that on a somewhat bulky article in proportion to its value. It will thus be seen that the question whether the bottle shall be made in England admits of no manner of doubt; the fact of dark glass being chiefly used is also of interest, especially when it is borne in mind that, at the present time, it has survived almost exclusively for the holding of wine. This may be for two reasons; in the first place, the materials used, being common, do not require clearing or even care in their selection, while the dark color, with its consequent interference with the rays of light, would, and does, prevent the color of the wine from being in any way affected by the light rays, and bleaching action or discoloration is avoided.

Perhaps the most interesting point in connection with the history of the bottle is the custom which obtains of having the name of the merchant impressed upon its surface. This fashion has been in use for at least 240 years, and to it we owe a great amount of the information we now have concerning the history of British glassware, though it must be confessed there is still much to be learned. It was, as is well known to antiquaries, the fashion in the latter part of the seventeenth and the whole of the eighteenth century to put the date—or, rather, the year—upon things,

that purpose, much in the same way that the impression of a seal is affixed to a letter in wax. Other devices were sometimes used, such as a coat of arms, or crest, and occasionally initials. These would indicate that the bottles were specially made for the consumer of the wine, and, being so, would be continuously used, over and over again, especially so as the cost of the bottles themselves must have been a considerable item in bygone times. It would appear that the earliest form made in this country was a simple bulb blown on the end of a long neck, and roughly provided at the mouth with an encircling ridge, so that a cover could be tied on underneath the ridge to cover the cork or stopper. This projection is very pronounced, vigorously indicating the purpose for which it is placed there. The bottle on the right-hand side of one picture is a typical illustration of this early form; the seal is impressed with the figure of the crowned leopard heraldically displayed, from which its date may be assumed to be somewhat about the end of the sixteenth century, and it is quite Tudor in style. The surface of this specimen is much decomposed from having been buried, and was originally quite black, though slightly transparent. The other one, alongside, gives the next and first step toward a molded or shaped form, being blown in a larger bulb than the earliest; the straight side is produced by being rolled on a flat slab, the bottle thus assuming a more useful form both for capacity and handling. The approach to the cylindrical is here first suggested, and it gradually increases, with, of course, variations and exceptions, until it becomes the common

NA'ILSEA WARE.

wine bottle, truly cylindrical, of present everyday use. The earliest dated bottles at present known partake of this form, which, in all probability, was that in use in nearly the whole of the seventeenth century. A number of these have been found in making the excavations for foundations in and about the city of London from time to time, and when found the surface is decomposed, and frequently beautifully irides-

"Williamson Alford, 1723," and "I. Bilton, 1729," respectively. Similar in form, the workmanship of the impressing seal is very different; in the former it is excellent, while in the latter it is rude and irregular.

EARLY SEVENTEENTH CENTURY.

The larger bottle in the same picture is similar, but a little more symmetrical in contour; it is lettered "W. Stinton," and dated the memorable year "1745." Along with it is a smaller bottle of the earlier type "Rd. Cooke," 1734, showing an overlapping of periods usual in historical research. The cup between is of dark, somewhat coarse glass, and of early date; it was found in the thatch of a cottage during demolition,

EIGHTEENTH CENTURY.

and contained the smaller silver coins of James I. and Charles I., but none later, probably a hoard during the troublous times of the Commonwealth. The cup itself is much worn by usage, and may be estimated with a fair amount of accuracy as having been made in the early years of the seventeenth century, possibly about 1610. Somewhat surprising is the light green glass bottle in another illustration, initialed "C. L.," and also dated "1734." At first sight it would appear as though this was a totally different type, but such is really not the case; it is the same, as is proved by the form of the neck, but the lower part is elongated by being pressed into an octagonal form, which, if it had not been so manipulated, would have been of the usual shape. The color of the glass, a bright clear sea green, the octagonal shape, with the general appearance of height in comparison to width, mark it as unusual. The other shown in this illustration is the more immediate ancestor; the width is more contracted, the body more cylindrical, and the height, in proportion to the diameter, much greater. This form was common in the later half of the eighteenth century; it was still hand-made, i.e., not blown in a mold, and the glass itself very black. This is lettered "G. R.," probably the royal monogram for George III. It is identical in shape, size, and color to one in the museum at Penrith, Cumberland, initialed "E. L.," and dated "1786." At the beginning of the nineteenth century the seal disappears, and the "blown in a mold" comes in, the hand-made bottle only surviving for the first few years, and for out-of-the-way purposes. Such a one is shown in one of the pictures, which is a fine specimen of what is known as splashed ware; it has a capacity of one gallon, and is 14 inches high, its use being to hold or carry beer at harvesting times. This ware was made at Nailsea, not far from Bristol, from the year 1794 to well on in the next century, the date of this bottle being about 1802, or possibly

1745.

CIRCA 1620.

1734.

and this was much in evidence on wine bottles. For one thing, the year may have been used to indicate that particular vintage, and possibly for choice and expensive wines special bottles would be made, bearing the merchant's name and the year. These names and figures were impressed upon the side or shoulder of the bottle, on a small dab of glass placed there for

cent, as is this specimen. It will be observed that the shoulder is almost a corner, the roundness of outline being between the neck and the shoulder. From this time the form of the outline began to reverse, the corner being at the base of the neck, and the round on the shoulder; this is well shown in another of the illustrations. These bottles have impressed upon them

a year or two earlier. It will be noted that there is a decided tendency to go back to earlier forms in it, as evidenced by the taper neck and round-shouldered body, the handle adding greatly both to utility and

elegance. Another point of interest is that, with the exception of the very earliest type, the "kink" in the bottom or underneath the bottle always has been quite as large in proportion as in the worst cases of

the present time, the first one in the second illustration having a very large indentation, occupying at least one-third of the internal capacity.—Country Life (London).

AN AEROPLANE FACTORY.

WHERE THE FRENCH MACHINES ARE BUILT.

THE largest and most successful aeroplane factory in the world is the establishment of the brothers Voisin at Billancourt, near Paris, where the machines of Farman and Delagrange were constructed. The workroom, filled with great flying machines and their separate parts, presents a strange and picturesque spectacle, but what especially impresses a thoughtful visitor is the facility with which an aeroplane can be constructed. Here he finds nothing remotely resembling the formidable battery of apparatus which is required in building automobiles. A saw, a plane, a few planks, and iron sockets, and a quantity of muslin and iron wire practically complete the list of machinery and materials. An aeroplane, with the exception of the motor, can be made more quickly and cheaply than a cab.

The planks, which are of well seasoned ash, white pine or poplar, and about 30 or 35 feet long, are sawn into strips from 2 to 2½ inches square. Four such strips, connected by uprights and cross pieces about 30 inches long fitted into iron sockets, form the *fuselage*, or axis of the aeroplane, which is made rigid by diagonal wire braces. On the *fuselage* are placed a seat and a back for the operator and an iron base for the motor. To each side is attached a wing which is constructed, like the *fuselage*, of four strips of wood connected by cross-pieces and stiffened with wire braces. The two wings extend to right and left in the same straight line and their combined length, including the breadth of the *fuselage*, is about equal to the length of the latter, from 30 to 35 feet. Each wing carries two horizontal aeroplanes of muslin. Nothing remains but to mount the motor, propeller and rudders. The system by which the rudders are controlled is simple and ingenious. Horizontal steering is effected by turning a wheel to right or left, and vertical steering by pushing the same wheel forward or pulling it backward. If the motor is ready, an aeroplane can be constructed and assembled in a week.

The current price of an aeroplane is \$4,000 or \$5,000, about half of which is for the motor. The high price is justified to some degree by the novelty of the industry and the infrequency of orders. It would appear that the cost of preliminary studies ought not to enter into the account. The calculations and theoretical considerations have been furnished, for the most part, by a number of disinterested persons, particularly Capt. Ferber and M. Armengaud, and aviators have gratuitously added the results of their experience. If the aeroplane, in becoming more practical and popular, retains its present simplicity, the cost of construction should not, and probably will not, exceed a few hundred dollars.—L'Illustration.

THE CONSERVATION OF RESOURCES.

THE schedule of investigations adopted by the National Conservation Commission is in general a carefully considered plan, that will be of much benefit even if but partially executed. Indeed, the plan is so ambitious that it is impossible to expect that all of the inquiries will be answered.

Referring to the question of minerals, which interests us most, it is possible to make a rough approximation of the country's resources in coal, lignite, and iron ore, but the determination of the reserves of oil, gas, and other ores is beyond the ability of all of the mining engineers and all of the mining geologists together. The dowser, or the electrical mineral indicator, who can really find ore, has not yet appeared; nor the man who can see into the ground.

The nature and extent of waste in the mining and use of mineral products, and methods of preventing or lessening the waste are good subjects for inquiry; also the more complete utilization of by-products and increased efficiency in the use of all products. But the answer to these questions is simple, viz., encourage the reading of the technical journals.

We venture to correct an academic misapprehension. Americans are commonly considered to be wasteful; this probably is the idea in Washington. We think that Americans are wasteful in some respects, but in others are paragons of economy. As consumers, we are prodigal of our wealth and scandalously wasteful; as producers, our utilitarian ideas lead us to be egregiously economical. Who does not know the captain of industry who is a skinflint in his factories, and a spendthrift in his home or his club?

It is important to define what is waste. Practically we prefer to accept the unphrased definition of the operator in the field rather than the words carefully formulated by the professor in his cabinet or laboratory, because the operator has learned to appreciate many things that the professor generally fails to consider. There is much apparent waste which in reality is not waste at all. For example, remark is frequently made of the immense quantity of sulphur which is thrown away in the treatment of sulphide ores; but it is not considered that the only use for such sulphur would be the manufacture of sulphuric acid, and that most of it is thrown away in parts of the country where there is no market for sulphuric acid, nor probably will be for a time more distant than we can clearly see ahead. If the ores were reserved for an indefinite time, interest charges would overwhelm them.

In all considerations of waste, the position of capital must be held prominently in mind. Resources can be reserved if capitalization be postponed until they are within the safe margin of profitable activity, their

THE VOISIN AEROPLANE FACTORY AT BILLANCOURT, NEAR PARIS.

aspect until that time being as having no relation to commerce, just as if they were undiscovered treasures of nature. Otherwise, they would be saddled with colossal accumulations of interest, to avoid which wasteful exploitation would be compelled.

This is directly in line with many of our apparent wastes. For example, regenerative furnaces have never found so wide application in the United States as in Europe. The reason is that coal is dear in Europe and comparatively cheap in the United States; in the United States the saving of fuel, immense though it be, has not been sufficient to pay the interest and fixed charges upon the greater capital required for the plant. As coal increases in value, this condition will change. Engineers have long been conversant with the increased economy of gas engines, but for a long time they did not come into extensive use because the charges on greater cost of plant offset the apparent advantage in direct operation; as the cost of plant has been reduced, gas engines have come more extensively into use.

So it is through our whole line of industry. Only fifteen years ago we used to deplore that the United States possessed no chemical manufacture worth mentioning, save the rudimentary. So recently as that the time was not ripe for its development. But since then we have seen the growth of an immense chemical industry, utilizing by-product after by-product. This is something that our inventors and manufacturers may be relied on to attend to. A Gayley requires no artificial stimulus to increase the economy in making pig iron, nor does he need the efforts of a Federal commission to point out to him that there is a chance for effecting economy in that art.

fire. We burn our coal wastefully both in factory and in household. Our people are extravagant in their food and their clothing, not in using good things, but because they deliberately throw away a large part of what they buy. If Americans were as economical as the French, the wealth that this country would attain would surpass all belief. It is economy in living that has made the French people the bankers for the world.—Engineering and Mining Journal.

A rail-loading device capable of handling eight rails at a time has been devised for use on the Western Pacific Railway by Mr. T. J. Wyche, division engineer. It consists of two straight bars or yokes held apart by an iron pipe separator so as to have a span a few feet less than the length of the rails to be handled. To each yoke are attached eight bifurcated hooks, the two parts of which are about an inch apart, so that they straddle the web of the rail and catch under either the base or the head according to the way the rail is lifted, whether head up or head down. The hooks are strung along the yoke on heavy chains at the proper distances for piling rails in the customary fashion, one layer with heads up, and the other heads down, the latter fitting between the rails at the first layer. The device is swung from the boom of a locomotive crane, which is placed at one end of the flat car to be loaded or unloaded. The handling is done by first picking up eight rails, heads up, and placing them on the car, then following with the next lot of rails, heads down, so as to pile properly. The necessary splice bars are piled on two rails held by the hooks and then hoisted to place.