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URE'S DICTIONARY  
OF  
ARTS, MANUFACTURES, AND MINES

CONTAINING

A CLEAR EXPOSITION OF THEIR PRINCIPLES AND PRACTICE

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Illustrated with upwards of Twenty-one Hundred Engravings on Wood

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with a hammer, so as to compress it inwardly, and spread it outwardly on all sides around the place of impact. See STAMPS.

**BATTERY.** In *mining*, a stamping mill. In *electricity*, a combination of glass plates or jars, with both surfaces coated with tinfoil. A combination of zinc and copper, or of other dissimilar metal plates, which are placed in an acid solution, or some other exciting fluid. The galvanic battery. See ELECTRICITY.

**BAULK.** A piece of timber—the whole trunk of a tree. The term is applied by London timber-merchants to wood in lengths of from 20 to 25 feet and 10 inches square.

**BAUXITE.** A mineral which was at one time regarded as an ore of iron. It is so called from Baux, near Arles, the name of one of the localities in France where it is found. Its composition varies, but the following analysis of a specimen from Revest, near Toulon, may be taken as typical.—

|                               |      |
|-------------------------------|------|
| Silica . . . . .              | 2·8  |
| Oxide of titanium . . . . .   | 3·1  |
| Sesquioxide of iron . . . . . | 25·5 |
| Alumina . . . . .             | 57·4 |
| Carbonate of lime . . . . .   | 0·4  |
| Water . . . . .               | 10·8 |

It is used as the source from which to obtain aluminium with the most facility and in the greatest purity. See ALUMINIUM.

**BAY SALT.** The larger crystalline salt of commerce. See SALT.

**BAY, THE SWEET.** (*Laurus nobilis*.) Bay-leaves have a bitter aromatic taste, and an aromatic odour, which leads to their use in cookery.

**BAYLDONITE.** A hydrated arsenate of lead and copper from Cornwall. It occurs in little concretions of a grass-green colour; and was described by Prof. Church in the 'Journal of the Chemical Society' for 1865.

**BAYS, OIL OF.** This oil is imported in barrels from Trieste. It is obtained from the fresh and ripe berries of the bay-tree by bruising them in a mortar, boiling them for three hours in water, and then pressing them. When cold, the expressed oil is found floating on the top of the decoction. Its principal use is in the preparation of veterinary embrocations.

**BDELLIUM.** Two gum-resins pass in commerce by this name. One is the false myrrh (the *Bdellium* of Scripture), the produce of the *Amyris commiphora*. The other is the *African Bdellium*, obtained from *Heudelotia Africana*. Pelletier gives the composition of the African bdellium as—resin, 59·0; soluble gum, 9·2; bassorine, 30·6; volatile oil and loss, 1·2.

**BEADS.** (*Grain*, Fr.) Perforated balls of glass, porcelain, or gems, strung and worn for ornaments. Amongst some of the uncivilised races, beads are employed instead of money.

The use of beads is of the highest antiquity. They are found in the tombs of Thebes and in the ruined temples of Assyria. They are discovered buried with the mighty dead of Greece. The Roman lady had them placed with her in her grave; and even in the burial-places of the ancient Britons we find beads, and these, too, of a similar pattern to such as we have every reason to believe are as old as Moses. Indeed, the peculiar ornamented zigzag pattern of the most ancient beads has been always, and still is manufactured at Venice, and found over the entire continent of Africa.

Glass beads have long been made in very large quantities in the glass-houses of Murano, at Venice.

Glass-tubes, previously ornamented by colour and reticulation, are drawn out in proper sizes, from 100 to 200 feet in length, and of all possible colours. Not less than 200 shades are manufactured at Venice. These tubes are cut into lengths of about 2 feet, and then, with a knife, are cut into fragments, having about the same length as their diameter. The edges of these beads are, of course, sharp; and they are subjected to a process for removing this. Sand and wood-ashes are stirred with the beads, so that the perforations may be filled by the sand; this prevents the pieces of glass from adhering in the subsequent process, which consists in putting them into a revolving cylinder and heating them. The finished beads are sifted, sorted in various sizes, and strung by women for the market.

In the Jurors' Report of the Great Exhibition of 1851, are the following remarks on this manufacture:—

The old Venetian manufactures of glass and glass-wares fully sustain their importance; and those of paper, jewellery, wax-lights, velvets, and laces, rather exceeded their ordinary production. The one article of beads employs upwards of 6,000 people at the principal fabric on the island of Murano; and the annual value is

at least 200,000<sup>l</sup>. They are exported to London, Marseilles, Hamburg, and thence to Africa and Asia, and the great Eastern Archipelago.' The *perles à la lune* are a finer, and, consequently, more expensive bead, which are prepared by twisting a small rod of glass, softened by a blow-pipe, about an iron wire. The preparation and cutting of gems into beads belong especially to the lapidary. The production of beads of PASTE, and of artificial PEARLS, will be noticed under those heads respectively. In India beads of rock-crystal are often very beautifully cut. In 1871 we imported 2,204,241 lbs. of glass beads. See PASTE; PEARLS.

**BEAM TREE.** (*Pyrus Aria*.) The wood is used for axle-trees, naves of wheels, and the cogs of machinery.

**BEAN.** (*Faba* and *Phaseolus*.) See LEGUMINOSÆ.

**BEAN ORE.** (*Bohnerz*, Ger.) Brown iron ore occurring in ellipsoidal concretions.

**BEARINGS.** The parts of a machine upon which the movable portions are supported. Upon the correct adaptation of the rubbing surfaces to each other depends the value of a machine. If, for example, there should be much friction between the axles of a railway-carriage and its *bearings*, there would be a large amount of power lost in overcoming that friction.

It has, therefore, been the study of engineers to produce bearings which should offer great resistance to pressure, and from their smoothness produce as little friction as possible. Kingston's metal has been lately used in the large engines for our iron-clad fleet. Some of the railway companies are using an alloy of equal parts of tin and copper. Gun-metal is, however, commonly employed for the bearings of machines. See BRONZE; COPPER; KINGSTON'S METAL; UNGUENTS.

**BEAT-AWAY.** In *mining*, the process of working away hard ground by a rough method—with wedges and sledge-hammers—in the process of excavation.

**BEAUXITE.** See BAUXITE.

**BEAVER.** (*Castor Fiber*.) This animal is captured for its skin, and for the castor (*castoreum*), which is employed medicinally. See FURS.

**BEERINE**, or **BEBEERINE.**  $C^{98}H^{21}NO^6$  ( $C^{19}H^{21}NO^3$ ). An alkaloid discovered by Dr. Rodie, of Demerara, in the bark of the bebeer tree. It was examined more minutely by Madagan and Tilley, and still more recently by Von Planta, who has determined its true formula. It is very bitter, and highly febrifuge.

**BEDE.** In *mining*, a name given to a peculiar kind of pickaxe.

**BEECH.** (*Hêtre commun*, Fr.; *Gemeine Buche*, Ger.) The beech-tree (the *Fagus sylvatica* of Linnæus) is one of the most magnificent of our English trees, attaining, in about sixty or seventy years, in favourable situations, a height of from 70 to 100 feet, and its trunk a diameter of 5 feet. The wood, when green, is the hardest of British timbers, and its durability is increased by steeping in water; it is chiefly used by cabinet-makers, coopers, coach-builders, and turners.

**BEEF WOOD.** An Australian wood, of red colour, the produce of certain species of *Casuarina*. It is used for inlaying and marqueterie work.

**BEER.** The fermented infusion of malted barley, flavoured by hops, constitutes the best species of beer; known also as ale, bitter ale, porter, or brown stout, according to its varied flavour, colour, and strength. But there are many beverages of inferior quality to which the name of beer is given; such as spruce-beer, ginger-beer, &c., all of which consist of a saccharine liquor, partially advanced into the vinous fermentation, and flavoured with peculiar substances.

The ancients were acquainted with beer, and the Romans gave it the appropriate name of *Cerevisia* (quasi *Ceresia*), as being the product of corn, the gift of Ceres. The most celebrated liquor of this kind in the old time was the Pelusian potation, so called from the town where it was prepared, at the mouth of the Nile. Aristotle speaks of the intoxication caused by beer, and Theophrastus justly denominated it the wine of barley. We may, indeed, infer, from the notices found in historians, that drinks analogous to beer were in use among the ancient Gauls, Germans, and, in fact, almost every people of our temperate zone; and they are still the universal beverage in every land where the vine is not an object of rustic husbandry.

In the production of beer, the raw Barley, and Hops, which are the only materials necessary, have to undergo various processes which will be more fully described under the separate articles on MALTING and BREWING, but the changes which take place in those operations will now be considered.

### 1. THE MATERIALS.

**BARLEY.**—Barley, wheat, maize, and several other kinds of grain, are capable of undergoing those changes which develop the saccharine principle from which beer can be made; but the first-named is by far the most fit, and in this country is almost