The Uses of Copper

The average man, if asked to name, offhand, the uses of copper, would be likely to reply that the metal was used mainly for coining pennies and making wire, yet these uses employ barely more than a quarter of the copper that is produced. On second thought he might smile at naming copper coinage as an important consumer of the metal, yet his first thought would be nearer right than his second, for the Chinese Empire has used fifty thousand tons of copper for making new coins, within the past two years, thereby increasing the circulating medium of the country to the extent of four ounces to each inhabitant—for while fifty thousand tons of copper is a large quantity of metal, sufficient to load a thousand freight cars of the heaviest type used on American railroads, it is but a quarter of an avoirdupois pound per capita, when divided among four hundred million people.

Only the expert, of those engaged most actively in the copper industry, have the slightest idea of the diversified uses to which it is put, as shown by a chapter on the uses of the metal in the new edition of the Copper Handbook, published by Horace J. Stevens, of Houghton, Michigan. According to this book copper enters into almost every form of human activity, and the multiplicity of its uses is most surprising. Electric light, power and traction are immense consumers of the metal in the form of wire, and telephones and telegraphs find it indispensable, yet electricity requires only a trifle more than a quarter of the metal made. The engineering trades consume more than half of all the copper produced, mainly in the form of brass, but there are about a score of friction metals and alloys, each having its specific use, into which copper enters as a component part.

The building trades are enormous consumers of copper, and this sort of consumption is increasing rapidly. Copper roofs, cornices and fronts adorn the exteriors of business buildings in thousands of towns, while for interior work the great majority of modern buildings use copper, brass or bronze locks, knobs and butts. Brass pipes, nickeled, are in modern bathrooms and lavatories, and brass and bronze chandeliers, gas and electric fixtures are almost invariable. A dozen or more other very common domestic uses of copper are mentioned.

In the manufacturing world the uses of copper and brass are innumerable. One concern in the Naugatuck valley of Connecticut buys copper in ten-ton lots, monthly, solely for the making of watch-dials, all of the better-grade dials being of copper, enameled. The common pin requires hundreds of tons of copper yearly, insignificant as a single pin may seem. Bals for shoes and tips for shoe laces require metal by the scores of tons, and the thin metallic tips on rubber-tipped lead pencils are responsible for a surprising depletion in the stock of the metal.

In addition to the consumption of the metal itself, tens of thousands of tons of copper sulphate are required for arts and manufactures, and for horticulture purposes, in spraying fruit, trees, bushes and vines. It is very evident, from a perusal of the book in question, that copper plays a vital, and a far more important part than commonly supposed, in Twentieth Century civilization.

Another use of copper is for making mirrors.

The importance from the point of view of the health of the workpeople of obtaining a substitute for the tin amalgam used in the manufacture of mirrors has led many chemists to study the conditions under which metals are deposited from aqueous solution. These investigations have, however, usually had for their object the preparation of a liquid which would deposit a uniform and coherent layer of silver over a large glass surface at the ordinary temperature. Liebig was the first to solve this problem satisfactorily, and his method in which milk sugar is the reducing agent was formerly extremely used.

Other metals are not so easily deposited, and copper, which from its close relationship with silver one would expect to behave similarly, has never been observed to be so laid upon glass. Although copper mirrors have never been obtained by deposition of the metal from an aqueous solution, Faraday about the time when silver mirrors were attracting much attention made the interesting observation that a mirror-like deposit could be obtained by dissolving a little oxide of copper in olive oil and heating plates of glass in a bath of this liquid up to the temperature at which the oil decomposes. The mirrors, however, obtained by Faraday's method, if of any size, are liable to be stained or discoloured in patches by decomposition products of the oil, and they are, moreover, generally lacking in brilliancy. Further, as the deposition of the metal only takes place when the oil decomposes, the process is excessively disagreeable to carry out; and since the oil is spoiled it is also somewhat costly.

In the course of an investigation on the oxidation of aromatic hydrazines, the author made the observation that when solutions of cupric oxide are reduced by these compounds the metal is deposited upon the glass in the form of a brilliant coherent film if clear vessels are used.

The mirrors obtained by this method are very beautiful, as they show the lustrous red colour of burnished copper, and are as perfect in reflecting surface and as uniform as the similar mirrors obtained by the deposition of silver.

It seems probable that this method of depositing copper upon glass could receive important application in the production of objects of art.

The Royal Colleries Limited, the largest company ever chartered by the Provincial Government of Alberta, has been incorporated with a capital of $3,000,000 with the head office at Coleman.

The architectural competition for the proposed Administrative Building at Regina to be erected at a cost of about $1,250,000 is confined to the following firms: Darling & Pearson, Winnipeg and Toronto; Cass. Gilbert, New York, U. S. A.; Marchand & Haskell, Montreal; E. & W. S. Maxwell, Montreal; Mitchell & Raine, London, Eng.; F. Rattenbury, Victoria, B. C.; Storie & Von Egmond, Regina.