paration, and for medicinal purposes. Magnesium chloride ($MgCl_2$) be made by treating magnesite with hydrochloric acid, and magnesi sulphate by treating the same material with sulphuric acid. Magnesi chloride is used principally for making Sorel cement and in the manufact of cotton goods. Magnesium sulphate is used in the manufacture textiles, in the tanning of leather, and, in the hydrated form known epsom salt, for medicinal purposes. Epsom salt is also produced fr natural deposits at Clinton (see page 51) and elsewhere.

Magnesia (MgO) is used to some extent in glass making and in t rubber industry; crude magnesite is used with asbestos fibre as a he resisting packing for furnaces and pipes.

Metallic Magnesium.[1]

The metal magnesium is of a silvery white colour, chemically ine tough, malleable, and ductile when heated. It has a specific gravity (1·7 or two-thirds that of aluminum, and is the lightest metal known th remains comparatively unaltered under atmospheric conditions. Magn sium is used in powdered form, in ribbons, or in sticks. Powdered magne sium is used for flash lights in photography, in fireworks, and for flare etc., in military operations. Magnesium ribbon, as well as the powder, used in testing for phosphorus and potash in chemical laboratorie Massive magnesium in sticks is used as a scavenger, that is, a deoxidizin agent of alloys. Magnesium is a powerful deoxidizing and denitrifyin agent and its oxide is more stable at high temperatures than other agent such as aluminum, silicon, and phosphorus.

The metal magnesium has been produced chiefly by electrolysis o the fused double chloride of magnesium and potassium ($MgCl_2KCl$). Other processes, some of them still in the experimental stage, are reductio of the fused magnesium chloride with soda or aluminum, reduction with carbon, reduction of magnesia (MgO) or magnesite ($MgCO_3$) to slag form- ing residues, and electrolysis of dissolved MgO. The double chloride of magnesium and potassium used for this purpose is the dehydrated mineral carnallite obtained from the salt deposits of Stassfurt in Germany.

A small quantity of magnesium added to steel, copper, nickel, or various alloys of these and other metals, clears up the oxides of these metals that may be present and makes for a denser and more homogeneous pro- duct. Alloys of aluminum with a small percentage of massive magnesium have proved very useful. They are lighter than aluminum and have greater tensile strength and resistance to impact. Magnalium, an alloy of aluminum, with less than 2 per cent of magnesium and with equally small percentages of calcium, nickel, tin, and lead, has been used for kitchen and domestic ware, surgical and optical instruments, military equipment, etc. Aluminon alloyed with magnesium has been used for making larger castings. Numerous other alloys of magnesium and aluminum, magnesium and copper, magnesium zinc, etc., have been made. Conditions seem promising for a more extensive use of the metal in alloys in the future. The obstacle at present to such use is the cost of producing metallic mag- nesium. For instance, German magnesium sold at $1.65 per pound in

[1]Grosvenor, Wm. M., Metall. and Chem. Eng., vol. 14, No. 5, Mar. 1, 1916, p. 263.
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