

Mineralogical Chemistry.

Fluorine in Recent and Fossil Bones. By A. CARNOT (*Compt. rend.*, **114**, 1189—1192).—Analyses of many human and animal bones show that the proportion of calcium fluoride varies from 0.35 to 0.63, and that of calcium chloride from 0.20 to 0.39. Elephants' tusks contain an unusually small proportion of calcium fluoride and an abnormally large proportion of magnesium phosphate.

Fossil bones from post-tertiary formations contained from 0.88 to 3.82 per cent. of calcium fluoride, the proportion of calcium chloride being practically the same as in recent bones.

Fossil bones from formations of various ages were found to contain more than 10 times as much fluorine as recent bones, the proportion of calcium fluoride reaching to as high as 6.21 per cent. This increase is doubtless due to metamorphism, the fluorine being derived either from solutions of alkaline fluorides or from slow replacement by fluorine minerals with which the bones have been in contact. Direct experiment shows that solutions of alkaline fluorides act on bones with formation of calcium fluoride. There seems to be a tendency towards the formation of a crystalline fluorophosphate containing the same proportion of fluorine as apatite, but the proportion may rise higher than in apatite by reason of the action of the alkaline fluoride on the calcium carbonate in the bone. C. H. B.

Artificial Reproduction of Leucite. By A. DUBOIN (*Compt. rend.*, **114**, 1361—1363).—Potassium hydrogen fluoride is slowly heated to distinct redness and alumina is added to the fused salt. Silica is then thrown in in successive small quantities until all the alumina has been dissolved. When the mass is cooled and treated

with water, crystals of leucite are obtained several millimetres in length.

Leucite is also obtained in large crystals by adding alumina to fused potassium silicofluoride, but a double fluoride of aluminium and potassium is formed at the same time, and must be removed by treatment with potassium hydroxide solution.

A third method for the preparation of leucite consists in adding silica to a fused mixture of potassium fluoride and aluminium fluoride, prepared either by heating together calcined alumina and potassium hydrogen fluoride, at first slowly and afterwards at a red heat, or by adding to fused potassium fluoride either the product of precipitating the wash waters of the previous methods by alum or the double fluoride of potassium and aluminium.

Aluminium potassium fluoride, $3\text{KF}, \text{AlF}_3$, is obtained in elongated, birefractive crystals by heating an intimate mixture of calcined alumina and potassium hydrogen fluoride, at first slowly and afterwards to complete fusion, and extracting the cooled product with water. It is only slightly soluble in boiling water, but dissolves in a moderately concentrated and warm potassium hydroxide solution.

C. H. B.

Preservation of Mineral Waters. By P. PARMENTIER (*Compt. rend.*, **114**, 1363—1366).—Mineral waters containing carbonic anhydride, especially if they contain iron salts also, can only be preserved unchanged by collecting them in vessels previously filled with pure carbonic anhydride. It is essential that no trace of air should remain in the collecting vessels and that the water should not come in contact with air while the vessels are being filled.

C. H. B.
