and present the appearance of crystals rich in faces. Mr. Barker has found that they do not lie in zones or obey the laws of distribution of ordinary crystal faces, and cannot therefore be regarded as the faces of a single crystal. There is, however, no evidence, from etching by acid, that the bead is an aggregate of crystals. The nature of these remarkable faces is difficult to understand. A bead of platinum presenting the same peculiarities was measured by the late Professor Miller. — Chlormanganokalite, by Dr. H. J. Johnston-Lavis and Mr. L. J. Spencer. A preliminary account of this new Vesuvian mineral was given by Dr. Johnston-Lavis in *Nature* on May 31, 1906. A new analysis of the mineral gives the formula $Mn\,Cl_2$, 4 K Cl. The crystals are rhombohedral, with a rhombohedral angle of 57° 36′; they are optically uniaxial with very weak positive birefringence; the refractive index is 1·59 and the specific gravity 2·31.—Mr. L. J. Spencer exhibited a suite of beautifully crystallized minerals, presented to the British Museum by Mr. Percy C. Tarbutt, from the Rhodesia Broken Hill mines in North-Western Rhodesia. In driving a tunnel through one of the kopjes, which consist mainly of cerussite and hemimorphite, a cavern containing flint implements and bones of recent mammals was encountered, and a cavity in the bone-breccia on the floor of this cave was encrusted with magnificent groups of hopeite crystals (the rare hydrous zinc phosphate discovered by Sir David Brewster in 1823). In the vicinity of the cave, crystals of another hydrous zinc phosphate were found in association with descloizite (hydrous vanadate of lead and zinc). The crystals of this new species, for which the name *tarbuttite* is proposed, are anorthic; they possess a perfect cleavage in one direction, through which emerges obliquely the acute negative bisectrix of the optic axes. Cavities in the ordinary ore are lined with large twinned crystals of water-clear cerussite, which are encrusted with small crystals of hemimorphite.—A group of quartz-crystals from British Guiana was exhibited by Mr. Anderson and a fine crystal of apatite by Mr. Gordon.

CORRESPONDENCE.

CHEMICAL REACTIONS BETWEEN SOLIDS.

Sir,—The attention of geologists should be drawn, I think, to some recent experiments by Mr. E. P. Perman, briefly described in *Nature* for June 20th last, in the abstracts of the Proceedings of the Royal Society; and of which further details will no doubt soon be available. The author finds that reactions take place between many pairs of salts in the solid state, but he also finds that careful drying prevents such reactions. From this he concludes that the reactions are carried on by means of thin films of water, acting as ionizing solvents. Many salts react on merely shaking their powders together; but all the changes are greatly aided and accelerated by heat and by pressure.

The importance of these experiments for geologists will be obvious enough, and needs no insisting upon, particularly in connection with metamorphic problems. Indeed, geologists might claim a sort of priority, for Mr. Perman's "Heat, Pressure, and Water" have been allies of ours for many years past. Not that this detracts from the

https://doi.org/10.1017/S0016756800136970 Published online by Cambridge University Press

value of such work to us. It is just such work that we need, to put our ideas into more distinct and scientific forms; and modern chemistry will evidently do this service more rapidly than we could have hoped. Mr. Perman's salts were no doubt more tractable than those that are the components of rocks, but then it is quite certain that his agencies have been applied to rocks fully in proportion to the refractoriness of their materials. And Adams's experiments upon the flow of marble show that some rocks, at any rate, are not beyond the power of laboratory treatment.

In this Magazine for May, 1903, I attempted to apply the work of Roberts-Austen on the Diffusion of Metals to the Diffusion of Granite into Crystalline Schists, and, at the close of my paper, I dwelt on difficulties arising from the heterogeneity of the materials of rocks. But it is clear that chemical reaction between solids adds vastly to the possibilities of solid diffusion unaided by such changes, and a hope of further information of the kind is expressed in the concluding paragraph of the paper quoted.

Geologists will look forward with interest to the full text of Mr. Perman's paper, and hope that he will pursue these researches further still.

EDWARD GREENLY.

OBITUARY.

JOHN FRANCIS WALKER, M.A., F.L.S., F.I.C., F.C.S., F.G.S.

FORMERLY FELLOW OF SIDNEY SUSSEX COLLEGE, CAMBRIDGE.

(WITH A PORTRAIT, PLATE XVI.)

BORN NOV. 25, 1839. DIED MAY 23, 1907.

ALL lovers of Yorkshire may well feel proud of the many eminent geologists who either claim it as their birthplace, or have adopted this grand county, so rich in geological and palæontological interests, as their home. One recalls to mind the names of some belonging to the past and some still present with us: Young and Bird, Dr. Wm. Smith, the Williamsons, Martin Simpson, W. Vernon Harcourt, John Phillips, Dr. H. C. Sorby, Dr. Murray, J. Leckenby, Sir Charles Strickland, Dr. John Lycett, Rev. Professor J. F. Blake, W. H. Hudleston, Dr. Reed of York, Professor L. C. Miall, Ralph Tate, Jas. Wm. Davis of Halifax, Dr. Tempest Anderson, Samuel Chadwick, G. W. Lamplugh, and many others. To those worthies whose names are inscribed upon her past records, must also now be added that of John Francis Walker.

Born at York, Nov. 25th, 1839, J. F. Walker was, by inheritance, a Freeman of that city, where his family had resided for several generations, his grandfather having held the office of Sheriff in 1841. At an early age he commenced his education at St. Peter's School, York, and at 18 he became a student at the Royal Agricultural College, Cirencester, where under Dr. Voelcker, F.R.S., Professor of Chemistry, and Professor James Buckman, F.G.S., Professor of Natural History, he imbibed that earnest love of chemistry and geology which had such an important influence on his future career in life. In 1862 he entered Sidney Sussex College, Cambridge, and was bracketed first in the Natural Science Tripos in 1866. From Cambridge, after taking

https://doi.org/10.1017/S0016756800136970 Published online by Cambridge University Press