the results will be more or less in error if the weight of the potassium chloroplatinate is taken as final. Fortunately it is easy to overcome this handicap. Where it has been necessary to allow a determination to stand the weight of the potassium chloroplatinate should not be relied upon. This salt should be dissolved in hot water, the solution passing into a porcelain crucible. It is then slightly acidified with hydrochloric acid, a few drops of pure mercury are added and the whole evaporated to dryness on the steam bath and gently ignited. The residue in the crucible is the platinum from both potassium and ammonium chloroplatinates and potassium chloride, the ammonium salt having been volatilized. Simple leaching with hot water will remove the potassium chloride which can either be weighed directly after evaporation in a platinum dish or determined by difference after weighing the ignited filter and separated platinum in the original crucible.

It seems best to have the original platinic chloride reagent in solution in alcohol rather than in water and to filter it before use to avoid adding ammonium salts with the reagent.

The prejudice of many chemists against the use of platinum chloride prepared from laboratory scrap platinum appears to have no reasonable basis. The iridium content of ware made in recent years is very small since the price of iridium has been higher than that of platinum. Even where the iridium content of the solution is considerable it would appear to have little effect. The atomic weight of platinum (195.23) and iridium (193.10) are very similar. The two form analogous compounds with the alkalies which do not differ appreciably in solubilities in alcohols and water. Potassium chloriridate forms black octahedral crystals which serve to indicate the presence of iridium in the solution.

NOTES AND NEWS

STUDIES IN THE MICA GROUP (A DISCUSSION). A. F. HALLIMOND.

In a recent contribution to the *American Mineralogist* Dr. A. N. Winchell has included a very interesting comparison between a revision of his theory of the micas and the theory I ventured to suggest some time ago in the *Mineralogical Magazine.* The two theories yield in general very similar values for the composition of the principal minerals concerned, but Winchell's present assumption that Al_2O_3 is replaced by $MgO \cdot SiO_2$ necessitates a steady dimunition in the ratio $K_2O:SiO_2$ as the MgO increases, while my own suggestion that Al_2O_3 is replaced by MgO leaves this ratio unaltered. Dealing with the composition of muscovite, he remarks that a number of 'probably inaccurate' analyses (of sericite etc.) contain an average ratio $K_2O:SiO_2$ of only 69:600. I had disregarded these because I felt that the materials were of too doubtful a nature: if they are to be accepted we must both seek a new end member for this section of the group, since Winchell's earlier formula contains 8 SiO_2 (75:600) and his present formula 7 SiO_2(86:600). But I still think the best course is to leave the old analyses of sericite for better mineralogical identification: there remains a sufficient number of analyses of clean muscovites. Winchell points out that pure muscovite would not serve to test the substitution theories. But very few of the published analyses represent pure muscovite; out of the 46 analyses I quoted, no fewer than 25 contain over $30MgO:600SiO_2$, representing over 30 per cent of the phengite molecule; they are, therefore, well adapted for testing his theory. Referring to my diagram showing the incidence of potash ratios in these micas, he considers that 'the relative frequency of the potash ratios is not the question at issue.' But it is unfortunately the case that his theory requires a susbstantial diminution of this ratio, to below 96, in more than half the analyses plotted, and of this there is little trace in the muscovite diagram or in the diagrams for the other types of mica where similar considerations would obtain.

Reduction of the potash ratio to 95 would correspond with a reduction of roughly 0.5 in the percentage of potash, a quantity almost within the total accidental deviation to which isolated mineral analyses are subject. In these circumstances an ideal test of the theories would consist in a series of recent analyses made by the same observer, upon materials selected with care and graduated from pure muscovite up to the highest available content of MgO. Fortunately a series of this kind is available in the well-known research by Kunitz: the lowest ratio observed was 99:600, and there was no trace whatever of a progressive diminution in $K_2O:SiO_2$ as the magnesia increased. This was pointed out at the time by Kunitz in his own interpretation of the data, and until his analyses have been superseded it would seem that Winchell's substitution of $MgO \cdot SiO_2$ for Al_2O_3 cannot be maintained.

Winchell further observes, "It seems strange that it should be necessary to point out that it is not safe to conclude that the more uncommon ratios are all due to errors and do not actually occur." His reference to my work is incorrect, for my statement was (*Min. Mag.*, vol. **XX**, p. 307) "the small deviations being readily explained, either by experimental errors *or by the presence of small quantities of other molecules*." A reply on this point is therefore unnecessary.

With regard to the analysis of protolithionite which Winchell was unable to trace, I regret that the description should read 'Dana protolithionite 2' instead of 'polylithionite 8.' The ratios are correctly given and the analysis will be found on the page indicated a few lines below the position incorrectly given in my footnote.

In closing, I should like to express my appreciation of the very full discussion which Winchell has accorded to my theory; the free interchange of views will, I feel sure, greatly assist in the interpretation of these difficult compounds.

GARNETS IN THE NAVAJO COUNTRY

Albert B. Reagan, *Ganado, Arizona.*

The Navajo country occupies northeastern Arizona and parts of New Mexico and Utah. It is bounded on the east by the 108th meredian, and its other three sides are bounded by the valleys of the large rivers—the San Juan, the Colorado, and the

Little Colorado and Puerco, natural boundaries that have long been recognized by the native tribes. Its area is approximately 25,725 square miles, 22,400 square miles of which are held in reserve for the Hopi and Navajo Indians.

In this region garnets are found associated with basic intrusive rocks at more than twenty places, occurring most abundantly in agglomerate of volcanic origin; and are sufficiently abundant to be of commercial value in four localities—Moses Rock, Mule Ear, and Garnet Ridge, near the Utah-Arizona line; and Buell Park, in the Red Lake volcanic field. The ultimate source of the garnets appears to be a richly garnetiferous diorite gneiss, boulders of which are fairly abundant as inclusions in the igneous rocks.

These stones, known as "Arizona rubies," are pyrope garnets and range in color from the light shades to the very dark shades of the characteristic color of Burgundy wine. Many of the stones possess great beauty and are offered for sale both as uncut stones and as jewelery in all the trading stores in the region, and many cities of the west also have them for sale.

These stones are collected only by the natives of the region who find a ready market for them.

According to the announcement made on cover four of the October issue of the *American Mineralogist*, the entire stock of Ward's Natural Science Establishment has been presented by the members of the Ward family to the University of Rochester as a foundation in memory of the late Mr. Frank A. Ward, who for nearly fifty years served as President and Treasurer of the Establishment. The University in accepting this gift agrees to continue the Establishment as a supply house for a period of at least five years, the present staff remaining and receiving the assistance of the scientific staff of the University.

This announcement is very significant and will interest all readers of our Journal. The Establishment was founded sixty-five years ago by Henry A. Ward who held the chair of Professor of Geology at the University of Rochester. During all these years the Establishment has served as a distributing base for mineralogical, geological and biological supplies. It is safe to state that all collections of note whether private or in school, college or museum, both in this country and abroad, have been enriched from time to time by accessions secured from this great source of supply. It is but natural then that Ward's Establishment should now occupy an unique and almost indispensable position in our educational system.

After the death of Mr. Frank A. Ward the members of the family felt that some contingency might arise in the future which would close the Establishment and thus seriously hamper the scientific work which had been carried on for so many years. In the arrangement announced above a plan has been formulated whereby the future of the Establishment is assured for a definite period at least and the past service rendered to science and education continued and enlarged.

The University of Rochester is to be congratulated as this gift brings to the University material collected from all parts of the World. The geologists and mineralogists should also benefit by this transfer for with the recent large increase in endowment of the University of Rochester the financial resources now behind the Establishment should make it possible to undertake a larger number of collecting trips and to secure the best material obtainable for general distribution at moderate cost.

Dr. Reinhard Brauns, professor of mineralogy and petrography in the University of Bonn, has been elected a foreign member of the Norwegian Academy of Sciences at Oslo.

Dr. Eugene Allen Smith, emeritus professor of mineralogy and geology in the University of Alabama and state geologist since 1873, died on Sept. 7, aged eighty-six years.

According to *Science News* (Sept. 16, 1927) airship frames and light weight pistons may soon be made from beryllium or its alloys. The metal is about a third lighter than aluminum but is much harder, scratching glass easily. It is four times as elastic as aluminum, twenty-five per cent more elastic than steel, and shows a very high resistance to the corrosive action of salt water. Chemically it is related to aluminum and easily forms alloys with it. As it expands at about the same rate as cast iron its use for pistons seems feasible.

Mr. J. H. Ten-Eyck Burr of Cazenovia, New York, an enthusiastic member of The Mineralogical Society of America, died at Point Pleasant on the New Jersey coast on August 11th, 1927.

PROCEEDINGS OF SOCIETIES

PHILADELPHIA MINERALOGICAL SOCIETY

Academy of Natural Sciences, September 1, 1927

A stated meeting of the Philadelphia Mineralogical Society was held on the above date with the president, Mr. George Vaux, Jr., in the chair. Seventeen members and seven visitors were present. The resignation of S. Perlstein was read and accepted. Upon favorable recomendation of the council Messrs. John Hope and Phillip Ries were elected junior members. Nominations for the officers for 1927–1928 were made.

Mr. Biernbaum reported trips to the French Creek iron mines, to the Paterson, New Jersey trap quarries, and to museums and collections in Montreal, Canada. Specimens collected, and received in exchange were exhibited. The secretary *pro tem* exhibited specimens of analcite, apophyllite and natrolite collected at Cornwall, Pa., by H. F. Zerger. Mr. Trudell reported a trip to Moore Station, N. J., with Messrs. Knabe and Gordon. Mr. Cienkowski described a visit to the quarries at Stockton, N. J. Dr. Newcomet spoke of finding microscopic apophyllite at Moore Station, N. J.

Samuel G. Gordon, *secretary pro tem*