Types of Californian Miocene Foraminifera

FOLLOWING upon the review by "A.M.D." of Dr. R. M. Kleinpell's monograph on "Miocene Stratigraphy of California" in NATURE of December 23, 1939, p. 1030, it may be of interest to note that the topotype material with the actual described types referred to by the author of the above work have now been deposited by me in the micropalæontological collection of the Stanford University.

On p. 21 Dr. R. M. Kleinpell refers to my contribution, "Foraminifera from the Tertiary of California", 1900, *Proc. Calif. Acad. Sci.*, Geol., 1, 241–258, pls. 29, 30 (1900) as the first description of Californian Foraminifera, as follows :

"Topotype material from Chapman's locality has not been obtained. As it is impossible to examine his original material, all synonymy is based on comparisons with his figures".

At the time of publication (1900) I was in communication with Dr. J. C. Merriam—who had forwarded me the foraminiferal marl through my late friend, Prof. Rupert Jones—with regard to depositing these original types in a permanent museum in America. On my removal from London to Melbourne, to take up the position of State palæontologist, I was apparently lost to sight or memory by the American palæontologists concerned, although actively publishing in the meantime. It was only lately, however, since the publication of Dr. Kleinpell's work, that I have been able, through him and Prof. Hubert G. Schenck, finally to deposit the types of this original sample, which have now a historic interest, labelled "From a well in Santa Clara Co., California" in the Stanford University.

Inter alia, may I point out that by an oversight the reviewer remarks that in the above work of Dr. Kleinpell's "there do not appear to be any new species", whereas that author has described sixty-six new species and varieties.

FREDERICK CHAPMAN.

Crohamhurst,
17 Threadneedle Street,
Balwyn, E.8,
Melbourne.

I ACKNOWLEDGE the correction in Mr. Chapman's last paragraph of an unfortunate error, partly due to (though not excused by) the want of any typographical distinction in Kleinpell's book between new specific names and others.

A. M. D.

Phosphate Separation in Qualitative Analysis

IN ordinary elementary qualitative analysis, it is usual to remove phosphoric acid from solution as ferric phosphate by dropwise addition of ferric chloride under certain conditions after removal of Group I as chlorides and Group II as sulphides. Zirconium phosphate is well known to be insoluble in acid solution and it appeared that, as an alternative method, phosphoric acid might be removed by addition of a soluble zirconium salt. The following scheme has been found to work well with elementary students in our laboratories.

As usual, the filtrate from Group II is boiled until free from hydrogen sulphide and a few drops of concentrated nitric acid are added. An acid solution of zirconium nitrate is added dropwise until further precipitation ceases ; the whole is warmed and the insoluble zirconium phosphate filtered off. To the filtrate a further drop of zirconium nitrate is added and, if no precipitate forms, all the phosphate has been removed. Ammonium chloride and hydroxide are now added as usual, *the solution well boiled* and filtered.

The *filtrate* will contain any members of Group IV (Zn, Mn, Ni, Co), Group V (Ca, Sr, Ba) and Group VI (Mg, etc.) originally present and may be proceeded with in the ordinary way.

The *precipitate* contains the excess zirconium with any iron, chromium or aluminium originally present. It is boiled with sodium hydroxide, which extracts any aluminium ; on filtration the filtrate is neutralized with acid and aluminium precipitated as usual with ammonia. The residue, if coloured brown, contains iron. In any event, water and sodium peroxide are added to oxidize the chromium, which passes into solution as chromate. After filtration the insoluble portion is extracted with dilute acid and the presence of iron confirmed.

The presence of chromate in the filtrate should likewise be confirmed lest any titanium in the zirconium salt should yield coloured pertitanate, which might either be mistaken for or serve to mask any chromate.

The foregoing method appears to be somewhat more straightforward than the usual procedure and is more easy to explain chemically to the elementary student than the usual method.

A disadvantage lies in the cost of the pure zirconium nitrate solution. But as zirconia is relatively inexpensive, and the presence of hafnium is immaterial, since it behaves exactly like zirconium in these reactions, it should not be difficult to place suitable solutions of the nitrate on the market at a reasonable cost, provided a sufficient demand arose.

It is, of course, important that the zirconium salt shall be pure. By spectroscopic analysis we have invariably found aluminium to be present both in zirconia and in various zirconium salts purchased from reputable firms. In our experiments, therefore, a solution of the nitrate was boiled with excess sodium hydroxide, the precipitate washed repeatedly by decantation and allowed to settle over night. The suspension was then dissolved by warming with half its volume of diluted nitric acid (1 : 1) and the resulting solution was ready for use.

J. NEWTON FRIEND.
REECE H. VALLANCE.
H. J. G. CHALLIS.

Central Technical College,
Birmingham.
June 20.

Swelling of Wood Charcoal : Experiments with a New Silica Extensometer

AN all-silica extensometer was made to the senior author's design by E. L. Mays, with the object of overcoming certain difficulties encountered in the measurement of the linear expansion of wood charcoal by means of the metallic extensometer pre-