from the Roker Cliffs at Sunderland. Most of this surface is above the tide-mark. Many of the calcareous balls exposed in any part of this bed exhibit similar narrow concentric zones, which also are a rearrangement of the carbonate of lime in an orderly fashion after the formation of the spheres. A few years ago in Fulwell Hill Quarry I saw, on about the same horizon as the top of Carley Hill, already mentioned, a bed of such balls 2 in. to 3 in. in diameter, from which a few feet of Boulder Clay had been removed six years earlier. These also had the same concentric lines, but as yet I have had no opportunity of fixing a time-scale for the formation of zones shown in Fig. 1. I ought to state that a few microscopical examinations of unweathered specimens revealed no such lines across the rod structure. The two forms of weathering are probably due to the same physical change. The second one, when I saw it in 1901, I supposed was due to segregation, and therefore I have since then called it segregation banding, but a better title is possible. Similar zonings of carbonate of lime have been produced by osmotic action by Prof. S. Leduc, of Nantes, and are shown on p. 84 of his "La Biologie Synthétique" (A. Poinet, Paris). Much the same thing is now known as Liesegang's rings, but who can claim priority I do not know. Except for a considerable difference in width of the interspaces they closely resemble the zones in weathered mortar due to rearrangement of carbonate of lime.

GEORGE ABBOTT.

2 Rusthall Park, Tunbridge Wells,
December 30, 1916.

Tertiary Igneous Rocks of the Pyrenees.

THE review of the treatise of Beyschlag, Vogt, and Krusch in NATURE of August 3, 1916, gives prominence to their mention of supposed absence of Tertiary igneous rocks. Yet even their pages figure grey-copper veins of Los Arcos cutting Tertiary beside ophite and granite intrusions. The latest official map of a Pyrenean district (Orthez) figures the ophite veins cutting uppermost Cretaceous, which I have insisted on during thirty years. In that time I have succeeded in securing by fossil evidence the recognition of the Cambrian of the map of 1890 as Hippurite Cretaceous, the "Silurian" slates of Lourdes as Middle Cretaceous, and the Scolithia beds of San Sebastian as Nummulitic Eocene. The erroneous classification led to the conception of the entire Pyrenees as rolled from the Sierra Nevada in such confusion and reversal as forbid attention to local and detailed observation, in the progressive correction of the map of Dufrénoy.

Yet even in Cornwall the excellent version of French methods supplied by an eminently practical miner has promoted accurate observation, and even Suess has returned, in his latest pages, to the principle of direction. As a hopeful science, apart from literary speculation, geology must aim at verifiable measurements and fossil confirmation. As example, I may quote my latest revision of the cluster of interior basins between Pamplona and Bayonne, which present floors of the plain Cretaceous border, now cited as exposures of that plain beneath a shovelled Palæozoic mass. With accurate mining plans, I trace their Cretaceous filling, in places, to the highest surrounding summits, and its successive beds as distinctly synclinal in disposition. Exceptional points of dislocation and reversal prove to accompany those local faults attested in mining work, abounding specially on the depressions followed by the high roads of the tourist's automobile. The Tertiary age of much of the ophite and granite of the Pyrenees has been my main contention since my first map of 1881, confirmed in both France and Spain, and affording a fresh clue from the most neglected portion of the chain. The latest observations in both Alps and Andes led Suess himself to rehabilitate the importance of igneous intrusion, and its recognition in connection with mining and orogenics has seemed to me of supreme utility in practical geology.

P. W. STUART-MENTEATH.

Ciboure, January 20.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

THE sixty-ninth regular annual meeting of the American Association for the Advancement of Science was held in New York City on December 26–30, 1916, under the presidency of Dr. C. R. Van Hise, of the University of Wisconsin.

The headquarters of the meeting was Columbia University, but, with the twelve sections of the association and the fifty-two national societies of restricted scope affiliated with the association at this meeting, the large lecture-rooms of Columbia University were insufficient, and meetings were also held in the American Museum of Natural History, in Barnard College, in the College of the City of New York, in the Cornell Medical College, in the College of Physicians and Surgeons, and in the Union Theological Seminary. The association, while holding annual meetings, is making especial effort to have every fourth meeting unite all the scientific societies of the United States, and this meeting at New York was the first of these four-year meetings. The second will probably be held at Chicago in 1920.

The attendance was larger than it has ever been in the history of the association. More than two thousand registered at the association headquarters, and it is estimated that above a thousand more were in attendance at the meetings held in other parts of the city.

The address of the retiring president, Dr. W. W. Campbell, of the Lick Observatory, University of California, on "The Nebulæ," was delivered on December 27 in the large lecture-hall of the American Museum of Natural History. The address was followed by a reception given by the trustees of the museum, and the guests were received by Mrs. H. F. Osborn and by Mr. J. H. Choate, former United States Ambassador to London.

During the week presidential addresses before the different sections were given as follows:—

Prof. W. A. Setchell, of the University of California, before Section G, on "The Geographic Distribution of Marine Algæ." This address was followed by a symposium on the relations of chemistry to botany.

Prof. E. Davenport, dean of the College of Agriculture of the University of Illinois, before Section M, on "The Outlook for Agricultural Science." The address was followed by a discussion on "The Adjustment of Science to Practice in Agriculture."