sometimes offered fossils and other odd rock specimens for sale to members of the expeditions. With due tact and care it is quite easy in the pursuit of one's investigations to avoid offending the more unenlightened elements of a people who still largely live in an atmosphere of the Middle Ages, and who have cogently declared that Western civilization can do nothing for them but promote unhappiness.

[1] Ruttledge, "Everest 1933", 312.
[2] Heron, *Geog. J.*, **59**, 418 (1922).
[3] Odell, *ibid.*, **66**, 289 (1925).
[4] Wager, *ibid.*, **89**, 239 (1937).
[5] Personal communication.
[6] Filchner, *Geog. J.*, **92**, 60 (1938).

Obituary Notices

Prof. E. B. Wilson, For.Mem.R.S.

BY the death on March 3 of Prof. E. B. Wilson, the United States has lost her foremost zoologist. During his long tenure of the professorship in Columbia University he made some outstanding discoveries in his science. He studied the growth and structure of the so-called 'trochophore' larva which is specially characteristic of the annelid worms. It is also found in the Mollusca, a group widely divergent in structure from the worms. Further, it occurs in the Polyzoa Entoprocta and Phorerudea, and in a modified form it is seen in the Nemertinea. There can be no doubt that it represents in modified form the common ancestor from which all these groups diverged. If we put them all together, we see that in this way the origin of a large proportion of the Invertebrata is accounted for.

Prof. Wilson introduced the conception of 'cell-lineage' into embryology. By this is meant the study of the growth of a particular cell in the cleaving egg until it gives rise to an organ in the fully developed trochophore. He recognized two types of cell lineage which he termed respectively "determinate" and "indeterminate" cell-lineage. In the former type, which is characteristic of the trochophore group, each particular cell of the egg gives rise to a particular organ. The latter type is characteristic of the Cœlenterata and Echinodermata. In this type up to a certain stage in the cleavage the cells are equipotential, that is, each of them can give rise to the whole organism.

In his later years, Prof. Wilson took up the study of the growth of the nucleus, because this is the sole carrier of heredity. This is proved by the case of the mammalian spermatozoon, which consists merely of a nucleus but which transmits all the characters of the father to the young organism. Prof. Wilson had as his colleague in Columbia University Prof. T. H. Morgan, whose famous theory of the chromosomes swept over America like a whirlwind. This theory was based on studies of the fruit-fly, *Drosophila*, and professors of "drosophily" have actually been appointed in some American universities. Wilson accepted with some reservations his friend's chromosome theory; but he was more conservative than Morgan, and refused to associate special characters with particular bits of chromosome. In 1913, Wilson received the honour of an invitation to deliver the Croonian Lecture to the Royal Society, and he chose chromosomes as his subject.

Wilson's influence on the course of the study of embryology was very great. A large band of young workers in both the United States and Europe continued and extended his studies in cell-lineage. My own acquaintance with Wilson extended over a considerable number of years. I first met him in Naples in 1892 when we were fellow students in the Zoological Station. Afterwards, I met him in the United States when we were both members of the American Society of Zoologists and I was professor at McGill University in Montreal, a few miles from the American border. His ill-health and subsequent death were due to a tragic accident which befell him when he was conducting a body of students, men and women, on a cruise up the Pacific coast of Canada. On the return journey the boat struck a rock and foundered. Some of the students were drowned and others, including Wilson, had to spend hours in the icy water before being rescued. From this exposure, Wilson contracted rheumatism, which crippled him during the remainder of his life and ultimately led to his death. It is too sad to think of the additional work which he might have done had this accident not occurred.

E. W. MACBRIDE.

Prof. A. P. Coleman, F.R.S.

THE death of Prof. A. P. Coleman, emeritus professor of geology in the University of Toronto, will be regretted by all geologists, for he was one of the few remaining representatives of that school of teachers who had received their early training at a time when geology was still a self-contained study and had not differentiated into the varieties of interest that now divide us.

Born at Lachute, Quebec, and educated at Victoria University, Coburg, Canada, Coleman proceeded, as did many Canadians at that time, to Germany, where he obtained the Ph.D. degree of Breslau. On his return to Canada he was made professor of geology and natural history at his old University in 1888, and remained there until 1890 when he was appointed to the University of Toronto. His ability was early recognized both in England and in North America as is shown by, among other distinctions, his election to

the Royal Society, the award of the Murchison Medal of the Geological Society of London and the Penrose Medal of the Geological Society of America.

Like all of his generation, Coleman's geological interest was wide, and we have from his pen papers dealing with such contrasted subjects as ore deposits and palæontology, pre-Cambrian stratigraphy and Pleistocene geology. Wide as was the scope of his work, however, it is probable that he will be remembered most for two outstanding studies, the geology of the great nickel ore-field of Sudbury, Ontario, and the evidence and history of past ice ages. The mapping of the Sudbury district involved much more than a study of the ores themselves, for it necessitated the unravelling of the geological history of a most complicated series of pre-Cambrian strata which in its turn had far-reaching effects on the interpretation of the structure of the "Canadian Shield" as a whole. Notwithstanding the great amount of work that has been done in this area by the geologists of the Dominion Geological Survey, the Ontario Department of Mines and the International Nickel Co., there has been substantially no change made in the rock groups that Coleman differentiated in his map and report of 1913.

In assessing the merit of this study one has also to remember the conditions under which it was executed. When Coleman entered the field it was still the typical wilderness of northern Canada, without roads of any kind and, in much of the area, without even trails. Owing to the somewhat unusual topography also, canoeing did not provide that ready means of access which is common in Ontario and Quebec, so that Coleman had to carry his survey through mostly on foot. Notwithstanding these difficulties his map has survived the exacting demands made on it by mining engineer and prospector, and the only change of any moment has been the recognition of faulting in the south-western corner. Some more significant alterations have been made, however, in his interpretation of the origin of the ores themselves, and there are few geologists now working in the district who would accept his theory of the formation of the sulphides by liquation from the adjacent norite either through the action of gravity or by some form of filter-pressing.

In his other important study, that of the past ice ages, Coleman was the first to present conclusive evidence of the glacial origin of the Cobalt conglomerate and to show its similarities with Pleistocene glaciation. He was convinced that the tillite could be traced as a definite horizon throughout the Huronian rocks of Ontario, but some doubt has been cast on this thesis by Collins's identification of the Ramsay Lake conglomerate as an ancient regolith.

No reference to Coleman's work would be complete without a mention of his love for travel and exploration. He made a point of seeing for himself the most significant features of world geology and to this end travelled much in Europe, Africa, India, Australia and North and South America. It is this immediate familiarity with the field observations that is reflected in his most interesting book on "Ice Ages, Recent and Ancient" published in 1926, and one can well guess that it was from the same source that he derived that enthusiasm that made him so highly esteemed and successful a professor in Toronto. He also had the happy gift of portraying the scenes he had visited with water-colour sketches, one of special interest being probably the earliest picture we have of Mystery Mountain (Mt. Waddington) in the Coast Range of British Columbia. He did not restrict his painting to scenery alone but also applied it, in dramatic fashion, to the illustration of his theories of ore genesis.

T. C. PHEMISTER.

Dr. Louis Fabry

WE regret to announce the death of Louis Fabry, the well-known French astronomer. He was born in 1862 and belonged to a family that has given eminent men of science to their country, one brother, Prof. Charles Fabry, being the renowned physicist; another brother, Prof. Eugene Fabry, is a mathematician of repute.

At the early age of sixteen years, Louis Fabry received the degree of Bachelier ès sciences, and after various other academic distinctions he was appointed to the Observatory of Paris in 1884 as a student astronomer. Two years later he went as assistant astronomer to the Observatory of Nice, and in 1890 he took up work at Marseilles Observatory, from which he retired fourteen years ago.

Fabry's interests in astronomy were very wide and he wrote on a diversity of astronomical matters. In 1893 he was awarded the degree of Docteur es sciences mathematiques for his thesis presented before the Faculty of Sciences in Paris, in which he showed that the absence of strongly hyperbolic orbits among the comets proved that these bodies were members of the solar system. In 1899 he dealt with the influence of his theory of cometary orbits on the hypotheses of cosmogony, and showed that the attraction of the distant stars and the lack of homogeneity in the primitive nebula, although not very considerable, were, nevertheless, not without influence, and their simultaneous intervention was sufficient to explain both the rotation of the sun and also the direct motion of the planets. In addition, these factors were responsible for causing the comets to deviate from the line which would make them fall towards the centre of the nebula, that is, the sun, and so prevented them from possessing perihelion distances that would otherwise have been practically zero.

Fabry did much useful work on minor planets, in particular, in the compilation of tables for facilitating the computation of ephemerides. The improvement of orbits by means of four observations is a well-known method but it involves rather complicated algebraic calculations. Fabry partly overcame this difficulty by means of new differential formulæ which introduced considerable simplifications in the solution of the problem. The method was later applied with great success by other computers. His tables on the perturbations of minor planets with small eccentricity and also small inclination proved very effective for the computation of the orbits and