

important results were secured. According to the first accounts, this coast includes granites of two ages. Prof. David and Mr. Priestley, during the Shackleton Expedition, referred all the granites to one period; according to the present volume (p. 433), the granites are of infinite variety, and probably belong to many ages. The majority are assigned to the interval between Cambrian times and the deposition of the Beacon Sandstone; and perhaps the most important contribution that is promised by this expedition is the determination of the age of these sandstones owing to the discovery of some fossil plants, which are said to be much better than the indefinite remains collected by the two previous expeditions. The specific identification of the fossils is expected, and they are said to indicate a late Palæozoic age. Further details are given of the great dolerite sill intruded into the Beacon Sandstone, and from the description it appears to be strikingly like that which forms the most conspicuous feature on the central highlands of Tasmania. Some copper ore was found on the cliffs at Cape Bernacchi.

Mr. C. S. Wright describes the nature of his observations on the properties of ice, and briefly discusses the cause of the northward flow of the Barrier. It is now universally agreed that the Barrier is due to the accumulation of snow, as first suggested in NATURE, and as the ice is afloat close to its landward end, it can only flow northward; and if the snowfall is continuous across it the velocity is necessarily greatest along its northern edge. Mr. Wright has also described the magnetic, electrical, and pendulum observations, and the measurements of the radioactivity of the air.

The biologist, Mr. Lillie, has given a short summary of the zoological work, and as fifteen rich trawl hauls were made, many new species may be expected. He remarks, however, while though there is an extraordinary wealth of individuals, the variety of forms is not very great, whereas the one Antarctic haul of the *Challenger* contained the highest proportion of new forms. But Mr. Lillie's result is what would have been expected, especially in the shallower waters.

The meteorological report by Dr. Simpson, though he says it will take years to work out the full results, contains some interesting suggestions. One passage illustrates the malicious irony of fate. He points out "one can now say definitely that the blizzards which have been so fateful to British Antarctic exploration are local winds confined to the western half of the Ross Barrier" (vol. ii., p. 463). He adds: "If this had been known previously, the history of the conquest of the South Pole would have been very different." Dr. Simpson was originally selected as the physicist for the expedition of the *Discovery*, but he was rejected on the grounds of health by the naval medical authorities. If he had gone on that expedition its observations on its chief meteorological problem would not have been set aside as unintelligible, and his conclusion would no doubt have then been so

clearly recognised that the great Antarctic tragedy might never have occurred.

Both volumes are superbly illustrated by photographs by Mr. Ponting, including one in natural colours, and by coloured plates after the beautiful sketches by Dr. Wilson. J. W. G.

RADIUM RESOURCES.

AN address to the sixteenth annual convention of the American Mining Congress, Philadelphia, October 20-24, by Mr. C. L. Parsons, of the Division of Mineral Technology, Bureau of Mines, is published in *Science* of October 31, dealing with the present commercial situation as regards radium and its ores, the available sources of radium in America and elsewhere, the prospecting for, concentration, and costs of mining carnotite, and the probable future of radium in the treatment of disease. A bulletin is about to be issued by the Bureau of Mines, and an advance statement was issued in April directing attention to the fact that in 1912 nearly three times as much radium in the form of carnotite deposits was produced from Colorado as from all the rest of the world put together, and was exported almost entirely to Europe.

The publication of this statement has already resulted in a considerable increase in the selling price of the material, and has rendered ores containing less than 2 per cent. of uranium oxide saleable, whereas before they were worthless. American carnotite is found in several districts in Colorado (Montrose and San Miguel counties), the Paradox Valley being described as the richest known radium-bearing region of the world, and in Utah, north-west of these counties, the deposits of which are of lower grade, but cost less in transportation than those of Colorado. In the latter case (Paradox Valley) mining costs 28 dollars to 40 dollars, and hauling charges to the railway 18 dollars to 20 dollars. The costs in the European markets average 70 dollars, and a 2 per cent. ore at Hamburg now sells at 95 dollars per ton. Mechanical concentration has been successfully employed, and it appears can save at least one-half of the material now wasted.

The equilibrium amount of radium (element) in a 2 per cent. U_3O_8 ore is about 5.25 milligrams per ton. The actual amount present in carnotite may safely be reckoned to be at least 4 mg., which, when extracted, sells for about 100l. Of this sum 20l. represents cost of raw material, leaving 80l. per ton margin for the cost of extraction and profits of the manufacturer and salesman.

Efforts are being made to foster the production of radium in the U.S.A., for although the total value of the world's output is insignificant, compared with that of commoner materials, being estimated for 1912 as 1,000,000 dollars, its potentialities in work for the public knowledge and public weal cannot be measured in cash. A National Radium Institute has been formed, working in conjunction with the Bureau of Mines, for

the performance of experiments and publication of results in concentration of carnotite ores, reduction of present wastage, and the extraction of sufficient radium for extensive trial in the treatment of cancer.

From a point of view nearer home, it is clear that, as in the case of the Austrian deposits, so also everywhere where radium is found, the question of its supply will be regarded more and more as of national importance, and a nation trusting to the equitable operation of the laws of supply and demand is likely to be squeezed out. The situation for this country is a sufficiently serious one. Nothing is more certain than that, if radium is to be of use in the treatment of cancer, small quantities are not merely worthless, but may even do harm rather than good. Grams of radium in each large centre of population, kept in operation every minute of the twenty-four hours, alone will meet the impending development. Whence is it to be obtained? Austria and America have the radium, Germany the mesothorium raw material. A future source of supply for this country is a question of national concern, though we have not, like the Bureau of Mines in America, a ministerial department likely to move in the matter spontaneously. In the public interest the matter should be lifted once for all above the plane of private venture and financial speculation. Will not the Institution of Mining and Metallurgy fulfil this public duty in lieu of a Bureau of Mines, and appoint an expert committee, mainly of practical mining authorities, but with representatives of technical chemistry and medicine, to consider the situation and take energetic steps to meet it?

FREDERICK SODDY.

PRESENTATION OF THE BUST OF SIR HENRY ROSCOE TO THE CHEMICAL SOCIETY.

THE former students of the Right Hon. Sir Henry Roscoe decided some time back to commemorate the celebration of his eightieth birthday in January, 1913, by presenting his bust to the Chemical Society of London. With this object in view a committee was formed, of which Sir Edward Thorpe has acted as chairman, and on which many prominent chemists who were students of Sir Henry's during the long period he occupied the Chair of Chemistry at Owens College, now the University, Manchester, were associated. The formal presentation of the bust, a photograph of which is here reproduced, was made at the Rooms of the Chemical Society on Thursday last, November 20.

Among those present, in addition to Sir Henry Roscoe, were Miss Roscoe, Mr. and Mrs. Mallet, Mrs. Edward Enfield, Mr. E. W. Enfield, Sir Edward Thorpe, Sir Archibald Geikie (president of the Royal Society), Prof. W. H. Perkin (president of the Chemical Society), Prof. H. E. Armstrong, Prof. H. B. Dixon, Prof. P. F. Frankland, Dr. Hugo Müller, Prof. W. Odling, Prof. Emerson Reynolds, Sir William Tilden, Sir Thomas and Lady Barlow, Sir J. Rose Bradford and Lady Bradford, Sir Henry Miers, Dr. Aubrey Strahan (president of the Geo-

logical Society) and Mrs. Strahan, Mr. Harry Baker, Mr. E. J. Bevan, Dr. Horace T. Brown, Dr. J. C. Cain, Dr. H. G. Colman, Prof. A. W. Crossley, Dr. J. Kent Crow, Dr. Dobbie, Mr. J. M. Fletcher, Prof. Harden, Mr. A. J. King, Dr. C. J. Martin, Dr. Rudolph Messel, Dr. E. J. Mills, Mr. Pattison Muir, Dr. J. C. Philip, Mr. Rupert Potter, Prof. Schuster, Dr. Alexander Scott, Mr. Evelyn Shaw, Dr. S. Smiles, Mr. Watson Smith, Dr. A. Smith Woodward, and Dr. Charles A. Keane (secretary to the committee).

Sir Edward Thorpe first presented to Sir Henry Roscoe the following address from his former students, which had been given him in a preliminary form on the actual day of his birthday, and to which the signatures of those associated with the commemoration had now been added.

On April 22, 1904, the jubilee of your doctorate of Heidelberg University, it was the privilege of 300 of your friends and pupils to express to you their



Bust of the Right Hon. Sir Henry Roscoe.

appreciation of your services to chemical science, and especially their gratitude to you for your stimulating influence as their teacher, and for your personal interest in their progress and welfare which has endeared you so lastingly to one and all.

To-day, on the attainment of your eightieth birthday, we gladly welcome a further opportunity of recording our continued appreciation of your long life and work. We extend to you our most sincere and heartfelt congratulations, and rejoice to know that you have been granted health and strength thus to prolong your successful labours and activities, and to add to the large debt of thanks that is your due from your pupils, your science, and your country.

Although it is now twenty-seven years since you resigned the chair of chemistry at Owens College, your influence as our teacher and friend has continued with us. Amongst your former pupils there are many who, thanks to the teaching they received at your hands, have been enabled to contribute to the advancement of science, and who in their turn, both in