Book Reviews

History and Role of Government Geological Surveys in Australia.

Edited by R. K. Johns; published by the South Australian Department of Mines. 111 pp, 1976.

Price: $3, obtainable from the State, and Northern Territory, Geological Surveys; and BMR.

Today, Geological Surveys are a feature of government science and technology in practically every country in the world, and nowhere is the development of those surveys more closely tied to that of their country than in Australia.

Gold was the mainspring of Colonial Government action in the formation of the Geological Surveys, but their birth and growth in the various Colonies (States since Federation in 1901) have not been without trauma, as is neatly illustrated by R. K. Johns and his fellow contributors in this book.

The State Surveys, the Northern Territory Survey, and the Federal Bureau of Mineral Resources, Geology and Geophysics, each form the subject of a chapter. The history of each survey is covered, albeit very condensed, from its inception to the present day. Each chapter contains numerous snippets about the surveys and their personalities, and the whole is liberally sprinkled with photographs of the cast.

The first Survey, that of Victoria, was inaugurated in 1856, and the others followed as important new mineral discoveries were made or as the Colonial Governments acceded to public and economic pressures.

In the early days, great contributions were made by a few dedicated individuals, working within limited budgets and with little technical support. Of the more notable personalities mentioned in this book, A. R. C. Selwyn, who was to make such a great contribution to Australian geology both directly and indirectly through the geologists he trained, arrived in Victoria, from Great Britain in 1852, to be attached to the Surveyor General's Department at an annual salary of £500. Selwyn's classic clash of interests with the Secretary for Mines ended in 1869 with his resignation and the temporary disbanding of the Victorian Survey.

It is interesting to note that in 1910 the Victorian Government rewarded the Survey for its work in opening the Wonthaggi coalfield the previous year by building a Geological Museum.

The setting up of the New South Wales Geological Survey in 1875 was followed in the next year by the opening to the public of the Geological and Mining Museum, and, as a welcome example of government farsightedness, we are told that in 1879 the Government purchased the private collection of the Reverend W. B. Clarke, "The Father of Australian Geology".

In 1879 R. Logan Jack became Government Geologist for Queensland, which position he held for 22 years. Between 1879 and 1880 he 'undertook a traverse of Cape York Peninsula from south to north, undergoing the rigors and dangers of travel in unknown country during the wet season, and facing the hostility of aboriginal inhabitants. During a surprise night attack on the camp he was speared through the neck. In spite of a painful wound he completed the trip to Somerset, meticulously mapping the geology, topography and river system'.

For the first year of the South Australian Geological Department set up in 1882 under the Commissioner of Crown Lands and Immigration, £1300 was voted for expenditure. The value of mineral production for that year is recorded as £460 000. The man appointed to the new position of Government Geologist was H. Y. L. Brown, a Canadian, and student at the Royal School of Mines in London. He came to South Australia in 1882 and worked there practically unaided until he retired in 1912. His achievements as an explorer-geologist have become legendary and it has been said of him that 'no single geologist has made such extensive personal contributions to the growth of our knowledge of Australian geology'.

It was H. Y. L. Brown who, as Government Geologist for Western Australia from 1870 to 1872, said 'The colony is extraordinarily rich in lead, silver, copper, iron, plumbago and many other minerals . . .' and who recommended several areas for gold prospecting, some of which ultimately proved to be auriferous.

In 1896 Gibb Maitland became Government Geologist for Western Australia and it is he who is responsible for surely the most delightful anecdote in this book; that which relates his employment of the notorious bushranger, 'Captain Starlight', who, having presumably retired from his illegal activities and using the name Major Pelly, established a reputation as a reserved and courteous civil servant, whose services to the Geological Survey were held in high regard by Maitland.

Survey activity throughout Australia has always been closely connected with the Mining Industry and, therefore, with the state of the economy. Intense mining activity has in the past engendered intense Survey activity, although in the mineral boom of the late 1960s many Survey staff were lost to the private sector, drawn by lucrative offers in the fight for geological expertise.

Meanwhile new horizons are opening. Environmental geology and the geology of the continental margin are just two of the new interests of the Geological Surveys. One enormous and vital task can be undertaken only by Geological Surveys —the assessment of the nation's total mineral resources, without which government economic policy moves in a partial vacuum. The realization of this has been slow. This book should ensure that the efforts of many of those who have participated in this realization or who have helped others attain it will not go unrecorded.

Those who are interested in the history of the Government Surveys in the broader context of Australian Geological Sciences as a whole will find Branagan & Townley (1976) a good complement to this book.

Branagan, D. F., & Townley, K. A., 1976—The Geological Sciences in Australia—a brief historical review. *Earth Science Reviews*, **12**, 323-346.

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Walter, M. R. (Editor), 1976—**Stromatolites.** Developments in Sedimentology, 20, 771 + 18 pp, Elsevier, Amsterdam.

Price: Dfl259; in Australian approximately $91

The book is concerned with a study of all aspects of stromatolites. Following the introduction, the second chapter describes field and laboratory techniques, including biological techniques, and discusses methods of classification. It seems likely that more will be heard of the computer-based qualitative image-analysis methods of classification. Abiogenic structures —calcretes, cave deposits, and geyserites—that may mimic the form of stromatolites, are described in the following chapter; it seems an early stage to do so. Thereafter biology is introduced in several contributions that describe extant stromatolite-building organisms, discuss their evolution, and review their organic geochemistry. The chapter emphasizes most clearly, through microbiology and geochemistry, today's multidisciplinary approach to the field.

Chapter 5 is given over to fabric and microstructure; of particular value is a lengthy treatment of the origin and development of cryptalgal fabrics. It is the Editor's belief that the study of stromatolites is essentially one of morphogenesis, the subject of the next chapter. Hamelin Pool at Shark Bay remains the most diverse assemblage of modern stromatolites, and a condensed version of morphogenesis from there is of value. So too is the discussion of the factors controlling the morphology of Riphean stromatolites from Russia, considered to depend both on taxonomic composition and environment.

The use of stromatolites in Precambrian biostratigraphy remains controversial: contributions to Chapter 7 include a statement of the Russian view on their application to the Riphean, a thoughtful critique on intercontinental correlation, and a word of caution to be applied before assigning geological age solely on the basis of stromatolites. The ghost of the dogma that stromatolites are marine intertidal forms must surely rest with the assembled documentation in Chapter 8, recent models for interpreting stromatolitic environments: documented not only from the marine intertidal, but also in ephemeral carbonate lakes, in sabkhas, in nearshore algal mounds of a salt lake, from freshwater algal marsh, in bioherms in a freshwater lake, and from within hot-spring sediments.

Chapter 9 discusses features in the tectonic, atmospheric, hydrological and biological evolution of the earth which must