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THE CONTRIBUTION OF NEW ZEALAND GEOSCIENTISTS
TO THE DEVELOPMENT OF SCIENTIFIC INSTITUTIONS

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ABSTRACT

The history of geology in New Zealand illustrates the ability of pioneer earth scientists to contribute to other scientific disciplines and to the foundation and administration of institutions for the promotion of science and research, thus exemplifying the late S.E. Hollingworth's conclusion "that geologists are particularly qualified to exercise sound judgement and to develop that capacity in non-technical aspects of administration and management". This tenet is illustrated by the careers and achievements of Walter B.D. Mantell, Ferdinand Hochstetter, Julius Haast, W. Lauder Lindsay, James Hector, and Colin Fraser.

NINETEENTH CENTURY VIEWS ON THE AUSTRALIAN MARINE PERMIAN

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ABSTRACT

Marine Permian sequences and faunas are widely distributed on the Australian continent and Tasmania. Marine fossils were found in eastern Australia as early as 1804 and were first described in 1825. Progressive investigations during the nineteenth century established the essential constituents of the eastern Australian faunas and the general nature of the sedimentary sequences. " Nevertheless the faunas were invariably ascribed by local stratigraphers to the Carboniferous System, or after 1879 when the term Permo-Carboniferous was introduced by Robert Etheridge Jr, to the latter age. Rarely, a Permian age was indicated for the sequence.

Western Australian Marine faunas were not studied systematically until the 1880s and available collections were small. However, even these early studies revealed few similarities with eastern faunas. Western faunas were invariably referred to the Carboniferous Period until well into the twentieth century.

THE EARLY HISTORY OF PALAEOLOGY IN WESTERN AUSTRALIA : 1791-1899

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ABSTRACT

The exploration of the coast of Western Australia by English and French explorers in the late eighteenth and early nineteenth centuries led to the first recorded discoveries of fossiliferous rocks in Western Australia. The first forty years of exploration and discovery of fossil sites in the State was restricted entirely to the coast of the Continent. Following the establishment of permanent settlements in the 1820s the first of the inland fossil localities were located in the 1830s, north of Albany, and north of Perth. As new land was surveyed; particularly north of Perth, principally by the Gregory brothers in the 1840s and 1850s, Palaeozoic rocks were discovered in the Perth and Carnarvon Basins. F.T. Gregory in particular developed a keen interest in the geology of the State to such an extent that he was able, at a meeting of the Geological Society of London in 1861, to present not only a geological map of part of the State, but also a suite of fossils which showed the existence of Permian and Mesozoic strata. The entire history of nineteenth century palaeontology in Western Australia was one of discovery and collection of specimens. These were studied initially: by overseas naturalists, but latterly, in the 1890s by Etheridge at The Australian Museum in Sydney. Sufficient specimens had been collected and described by the turn of the century that the basic outline of the Phanerozoic geology of the sedimentary basins was reasonably well known.

ACHIEVEMENT IN ISOLATION: A.W. HOWITT, PIONEERING INVESTIGATOR OF METAMORPHISM IN AUSTRALIA

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ABSTRACT

The earliest coherent observations of metamorphic phenomena in Australia were made by a police-magistrate, stationed in a remote part of Victoria and largely self-taught in geology. In a series of reports and papers issued between 1875 and 1892 that magistrate, Alfred William Howitt, recorded details of metamorphic progressions found in the mountains of eastern Victoria - from folded Palaeozoic strata to crystalline schists and gneisses, and of different sorts of granitic bodies in the regional metamorphic association.

Howitt worked at a time when the metamorphic status of crystalline schists was far from generally accepted in Europe and America: some still regarded them as portions of unchanged Primitive crust. Like George Barrow in Scotland - whose work in some ways he anticipated,

Howitt, however, through the influence of Lyell's writings, began as a believer in metamorphism. But whereas Barrow is respected for innovative contributions to metamorphic thought and method, Howitt's isolation in Australia kept his work little known. In fact, as recent studies show, Howitt was investigating a regional metamorphism different in style from that of Barrow. Howitt not only pioneered metamorphic petrology in Australia, he really began the study of what is now termed low-pressure regional metamorphism.

This paper seeks to set Howitt's metamorphic investigations in the contexts of his career and the then condition of his chosen subject. The principal influences on his approaches to petrography and metamorphism are seen to be German in origin. Howitt may have had no formal training in science but as a boy he lived in Germany for some years and learned the language. It was to be a most useful acquisition.

VERTEBRATE PALAEOLOGY IN QUEENSLAND

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ABSTRACT

In the mid-nineteenth century European settlers discovered prehistoric vertebrates in the northern part of the Colony of New South Wales, which later became the State of Queensland in 1859. Most of these finds were dealt with by overseas professionals, of whom Richard Owen at the British Museum (Natural History) (BM(NH)) was pre-eminent. By the late nineteenth century Australian-based vertebrate palaeontologists, who were usually self-educated, were beginning to work on Australian material. At this time, under the direction of Charles Walter De Vis, the Queensland Museum in Brisbane became the focal point for this science in Queensland: a programme of collecting was initiated which continued as funds allowed. The early twentieth century saw a new phase of exploration undertaken with the specific objective of collecting, carried out by large overseas scientific institutions. Thanks mainly to individual donations, new finds kept appearing regularly in the first half of the twentieth century. As a result there were scientific contributions from a few notable people, Heber A. Longman for example. Yet vertebrate palaeontology in Queensland languished, following the fortunes of the Museum between wars and it did not flourish again until after the Second World War. Since then both trained and amateur palaeontologists have been on the increase, and greater financial assistance has been made available from private, and State and Commonwealth Government sources, allowing progress in this science to be made.

THE ADELAIDE GEOSYNCLINE: A CENTURY OF CONTROVERSY

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ABSTRACT

Late Proterozoic (Adelaidean) to Late Cambrian sediments of the Adelaide Geosyncline form a mountainous backbone to South Australia. Geological studies of the region date back to the beginning of European exploration and colonisation, although these were limited until the 1940s due to the small, isolated nature of the geological community. No detailed understanding of this extensive region emerged until the beginning of the twentieth century when sections were measured and the significance of widespread Late Precambrian glaciation was recognised. The search for fossils has been long and often unsuccessful. Trilobites and archaeocyatha, which were later determined as Cambrian, were found as early as 1879. The internationally famous Ediacara fauna was discovered in 1946. Unusual piercement structures containing breccias were only widely mapped after World War Two with a diapiric origin being proposed in 1960. In 1952, the province was classified as basically miogeo-synclinal with a late stage eugeosyncline in the southeast. This has recently been reinterpreted in terms of plate tectonics.

SPECIALITIES, PROBLEMS, AND LOCALISM THE RECEPTION OF CONTINENTAL DRIFT IN AUSTRALIA 1920-1940

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ABSTRACT

Although A.L. Wegener signalled that the Australasian region was an important testing-ground for his theory of continental drift, in the period 1920-1940. his views aroused little interest among Australian scientists factors in this response. I argue that specialization and geological "localism" were important. Most scientists were silent or perhaps passively resistant, I suggest, because they saw no particular value in the theory for the problems which occupied them. Those few who did publicly support or oppose the theory often did so with respect to specialist concerns or specific problems. This response has implications not only for the general story of the "modern in the earth sciences but also for philosophical and social models of their acceptance. revolution"