The History of New Zealand's Tussock Grasslands: Evolution and Management: an abstract of his talk to be given on 11th of October.

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Information is reviewed from the time grasses first appeared in New Zealand's fossil record, in the Eocene, to the present. Grassland became widespread in the late Tertiary, as a result of the Kaikoura Orogeny and associated climatic deterioration, and was most extensive during the late Otiran Glacial. Contracting through the Holocene, it was restricted by 2500 yr BP largely to the alpine zone and the interior basins of the South Island. Grassland expanded 2500-1500 yr ago through natural fires at 500-2000 yr intervals in the drier areas of the South Island and locally in the North Island, but then largely waned until fires lit by the first Polynesians increased fire frequency about ten-fold. Grassland thus expanded rapidly in the South Island rainshadow region about 700 yr ago and periodic, perhaps accidental, fires maintained them until European settlement.

Initiated in the 1860's, pastoral farming began with an "eruptive phase" of heavy grazing by mammalian stock, a new phenomenon, plus frequent uncontrolled burning that adversely impacted on the grassland ecosystems. From an early concern for the pastoral practices of burning and grazing (Buchanan 1865), there have been frequent reiterations by scientists and others, up to the present, all to little avail in terms of condition and trend of the less responsive tussocklands. These concerns will be briefly outlined: 1910 (AH Cockayne; Commission on Canterbury Pastoral Runs Classification): 1912 (Petrie): 1919 (L Cockayne): 1920 (Commission to Report on the Southern Pastoral Runs): 1922 (Geo. Thomson): 1938 (Zotov): 1940 (Sheep-farming Industry Commission): 1945 (Gibbs & Raeside; Cumberland; Royal Commission to Inquire and Report on the Sheep-farming Industry in New Zealand): 1954 (Tussock Grasslands Research

Committee): 1956 (L Moore). The last two were largely instrumental in initiating a series of overdue autecological studies of the dominant species which clarified the important distinction between tolerances to the separate practices of burning (several positive effects revealed) and grazing (generally detrimental), plus the two combined (usually highly detrimental); (O'Connor & Powell 1963; Mark 1965a, b, c; 1968; Payton & Brasch 1978; Payton & Mark 1979; Payton *et al.* 1986).The degrading effects of pastoral management continued to receive attention from scientists and others: (Connor 1964, 1965; O'Connor 1981, 1982; O'Connor & Harris 1991; McKendry & O'Connor 1990: Basher *et al.*1990: Treskonova 1991, Kerr 1992, Mark 1994, Floate *et al.* 1994, culminating with the "South Island High Country Review" commissioned by the Ministers of Conservation, Agriculture and Environment, which confirmed the generally deteriorated condition of the rangelands (Martin 1994).

Legislative responses also occurred: the 1941 Soil Conservation and Rivers Control Act established catchment boards which arranged subsidised assistance for lessees to implement run conservation plans; the 1948 amendment to the Land Act gives pastoral lessees greater security of tenure; the 1991 Resource Management Act promotion of sustainable management of natural and physical resources; the 1998 Crown Pastoral Lands act facilitates lessees freeholding "*productive*" land while allowing land with high conservation/recreation values to transfer to Crown ownership/management. It also allows some discretion by the Crown in relation to conservation values on pastoral land. The effectiveness of this legislation will be discussed, particularly in relation to the Consultative Draft Code of Practice for burning vegetation in Otago, recently released by the Otago Regional Council.