

Australian Meteorites

A.W.R. BEVAN

Department of Earth and Planetary Sciences, Western Australian Museum,
Francis Street, Perth, WA 6000, Australia

ABSTRACT. Meteorites are an unique source of information about the earliest history of the Solar System. Since the first recorded discovery of a meteorite in 1854 near Cranbourne, Victoria, a total of 277 distinct and authenticated meteorites have been recorded in Australia. The material, including 13 observed falls, comprises 195 stones (ten achondrites, 183 chondrites and two unclassified stones), 68 irons, 13 stony-irons and one meteorite of unknown class. One hundred and forty one meteorites are known from Western Australia, 50 from South Australia, 47 from New South Wales, 14 from Queensland, 11 from the Northern Territory, ten from Victoria and four from Tasmania. A low ratio of falls to finds (1:20) compared with other countries (e.g., USA 1:7) reflects Australia's sparse population. However, normalised to population density, the rate of recovery of meteorites (falls + finds) in Australia exceeds that of most other countries of similar size and range of climatic conditions. More than 50% of documented meteorites from Australia have been recovered from Western Australia, 28% coming from the Nullarbor Region including many rare types. Excluding Antarctica, the Nullarbor Region has proved to be one of the most prolific areas in the world for meteorite finds. As in Antarctica, the frequency of meteorite types in the population of meteorites so far collected from the Nullarbor Region is depleted in irons, and may differ from that in the rest of the world. The climatic, physiographic and human factors that contribute to the recovery of meteorites in Australia are examined. Terrestrial ages of meteorites from the arid zone of Australia may help to provide a chronology for recent palaeoclimatic events.

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The available evidence suggests that meteorites originate within the Solar System, and most appear to be fragments of asteroids that are in solar orbits between Mars and Jupiter (Wasson & Wetherill, 1979). Meteorites have extremely old formation ages (4.55 Ga) and many have remained essentially unaltered since their formation. As samples from minor planets, meteorites are an unique source of information about a wide variety of events that

occurred very early in the history of the solar system.

Twenty five years ago there were, in total, specimens of about 2100 distinct meteorites known throughout the world, representing approximately ten new recoveries per year over the two centuries that meteorites have been recognised as important and collected. Approximately 40% of these were observed falls: the remainder were chance recoveries, or 'finds'. Since 1969, the remarkable