

JOINT COLLOQUIA

3 December 1969

THE ORIGINS OF AUSTRALIAN METEOROLOGY

By W. J. Gibbs

Dr. W. J. Gibbs, O.B.E., Director of Meteorology, gave this historical review of the development of meteorology in this country as the first of a new annual series of formal addresses.

Dr. Gibbs commenced his talk with the observation that the inconsistent accounts of early meteorological activities in Australia on closer inspection reveal a solid, if indirect, debt to two naval officers, Robert Fitzroy and Matthew Fontaine Maury. Both derived their lifelong interest in the Southern Hemisphere from extensive voyages in the 1820's and '30's.

Fitzroy in 1828 took over the command of HMS Beagle then engaged on a survey of Patagonia. He was no doubt greatly influenced by Charles Darwin, who in 1831 joined the ship as Naturalist for a survey which lasted 5 years and laid the basis for the "Origin of Species". Following a term as Governor of New Zealand (1843-5) Fitzroy in 1854 became the Head of a new Meteorological Department in the Board of Trade, which was established after the sinking of the "Henri IV" in the Black Sea and on the recommendation of the other naval officer, Maury.

Maury's direct contact with the Southern Hemisphere occurred during a four year circumnavigation of the globe in the USN ship Vincennes. Following an accident in 1839 which left him lame, Maury took over the US Hydrographic Office and instituted a global survey of winds and ocean currents. This culminated in his 1853 Maritime Conference at Brussels, which as Maury stated: "had no parallel in history. Previously naval men met only for planning war; this time it was to make navigation more secure". The Brussels Conference was a forerunner of the first weather "forecasts", so named and instituted by Fitzroy in 1860 and carried on till his death in 1865*.

The first meteorological observations in Australia had been taken by Cook and by the ships of the First Fleet, but regular observations covering more than a complete year on land did not begin until 1821, just before the arrival of Sir Thomas MacDougall Brisbane, Governor of New South Wales from 1822-1825. Brisbane deserves to be called the First Australian Meteorologist and may in fact have arranged for the observations to be started by Goulburn, the first Secretary and Registrar of Records in New South Wales, who took up his post a year earlier. Brisbane derived his meteorological interest from a lifelong occupation with navigational and astronomical problems, which made him set up his own observatories wherever he went. Thus not only did he establish such an observatory next to his residence in Paramatta soon after his arrival, but on the way when passing through

* The Royal Society took over the Meteorological Office and promptly stopped such unscientific activities until in 1879 the basic questions were regarded as sufficiently clarified for the resumption of forecasts.

Hobart he appears to have been responsible for initiating observations both at Hobart and at Macquarie Harbour.

Brisbane also created a Philosophical Society, whose members had to prepare and deliver scientific papers in rotation or else pay forfeits of £10. Even so the Society lived for four years and went out of existence only at the end of Brisbane's governorship. Subsequently meteorological observations were carried on into the 1830's by the official astronomer, Dunlop, and by a Captain King.

The next major development was the establishment of an observatory at Hobart by the Royal Society on the suggestion of Alexander von Humboldt, with Lieutenant Kay of Sir James Ross' Antarctic Expedition as first director. He was succeeded in 1854 by Jeffreys, a little before the Reverend Scott was appointed Government Astronomer in N. S. W. Scott established a series of 12 meteorological stations extending from Rockhampton to Cooma. In South Australia a former assistant astronomer from Cambridge, C. Todd, became Government Astronomer and Director of Posts and Telegraphs in 1856, and proceeded to establish the first telegraphically reporting network of meteorological stations. This made it possible in 1879 to issue the first weather maps using observations along the overland telegraph line to Darwin. Todd carried on this work until his retirement in 1906 and his observations were quoted by all the leading climatologists of the 19th century.

In Victoria, following observations started in 1853 by Ellery at his Williamstown home (built like an observatory) meteorological activities were greatly intensified by Georg Balthasar Neumayer, a merchant navy officer who had become stranded in Sydney when his sailors deserted the ship for the gold fields in 1852, and who himself had visited Bendigo and the German colonies along the Murray in 1853. He return to Melbourne from Europe in 1857 to establish, with the help of £2000 granted by King Maximilian II of Bavaria on the suggestion of Maury, an observatory on Flagstaff Hill. On his way back to Europe (where he later became the Director of the German Seewarte) he visited Hobart and made observations at the site of the, by then abandoned, Royal Society observatory.

Just before that the Reverend Scott had retired in New South Wales. Pending the appointment of a successor H. C. Russell temporarily acted in Scott's position, which he received permanently in succession to Scott's successor, J. R. Smalley (who closed all the meteorological stations but, luckily for meteorology, lasted until 1870 only). Russell at once reopened the stations and created new ones, designed their instruments, and studied a wide range of meteorological phenomena including relations between rainfall and the phases of the moon. He also started publishing daily weather charts in the Sydney Morning Herald in 1879 and became the first president of the Australian and New Zealand Association for the Advancement of Science, established in 1888 at the suggestion of Liversey. By the time of his retirement in 1905 at the age of 69 Russell had written more than 60 astronomical and meteorological papers. Perhaps the most notable of these was one on moving anticyclones, read to the Royal Meteorological Society in 1877 and defended in discussion by Symonds.

Another notable meteorologist, though of a different turn of mind, was Clement Wragge, who in his time had made regular series of climbs of Mt. Lofty, Mt. Wellington and Mt. Kosciusco to obtain observations for comparison with those made on peaks in the European Alps. Wragge became the first Government Meteorologist when he created the Brisbane Meteorological Observatory in 1897. He gave the first forecasts for the whole of Australia but resigned after unsuccessful attempts to create rain with the Steiger Vortex Gun.

Russell's successor was the former meteorological assistant in charge of weather map preparation, H. A. Hunt, who with a study of southerly busters had won the prize instituted by the Hon. Ralph Abercrombie during his visit to Australia. Hunt subsequently became (in 1906) the first head of the new Commonwealth Meteorological Service, created over the protests of the State Meteorological Bureaux as a federal body on the advice of the University of Melbourne.

The foundations of Australian meteorology were thus laid well before Federation and as it were part-time. No less than three Fellows of the Royal Society took part in their creation and honour is due to them for this achievement.

Dr. C. H. B. Priestley, F. R. S., in calling for a vote of thanks from Mr. E. W. Timcke, a former Director of Meteorology, mentioned that the name of Russell, as the first student of southern hemisphere general circulation, had at one stage been considered for the new Commonwealth Meteorology Research Centre. He suggested that the later history of Australian meteorology might also receive some attention and added that these Colloquia were suggested by him in 1948 and eagerly adopted by the then Director of Meteorology, Mr. H. N. Warren. Mr. E. W. Timcke, Warren's successor, in moving the vote of thanks contributed some memories of Stanthorpe's thunderstorm shooting with rockets and of a two pendulum clock designed by Russell which had been on show in the Meteorological Bureau at the start of his work there almost 60 years ago.

U. R.

17 March 1970

PHOTOBIOLOGY AND SOLAR RADIATION

By W. H. Klein

Dr. Klein, Director of the Radiation Biology Laboratory of the Smithsonian Institution, who was in Melbourne to attend the International Solar Energy Society Conference, delivered the first of three talks on this day to the Joint Meteorological Colloquium on radiation topics.

Dr. Klein began with an account of some general aspects of the effects of solar radiation on green plants, drawing attention to their broad spectral response characteristics and the range of light intensities involved in the photo-chemical reactions which occur. The higher intensities were shown to be associated with energy conversion systems and the lower range of intensities with the various regulatory responses. Coloured slides illustrated the kind of morphological changes which occur in plants grown in darkness and those irradiated in various spectral ranges. Dr. Klein then discussed briefly the laboratory procedures and the methods of controlling experimental conditions in the Smithsonian Radiation Biology Laboratories. He outlined the characteristics of "long day", "short day" and "day neutral" plants and illustrated the growth response of a "long day" plant in control rooms with differing red to far red irradiance ratios. Another slide showed the dependence of Wintex barley floral development on day length.