TEACHING ASTRONOMY IN NEW ZEALAND: THE WARD OBSERVATORY

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1. Introduction

New Zealand is a self-governed, independent nation, a member of the British Commonwealth, and a major center of Polynesian culture in the south Pacific. The country's two main islands lie between 34° and 47° south latitude, which places New Zealand south of many well known southern observing sites such as Sydney (Australia), Cape Town (South Africa), and Cordoba (Argentina).

The population of 3.5 million people inhabit a country slightly larger than the United Kingdom. The astronomical interests of this small population are nourished by no less than 25 local and regional astronomical societies. Amateur astronomers are active in New Zealand[1]. The Royal Astronomical Society of New Zealand coordinates national interests and hosts international activities[2].

2. Problems Associated with Growing Up Astronomically in New Zealand

Astronomy is taught in all New Zealand State and Private Schools in the 4th Form (the equivalent of the U.S. 9th grade) as part of the general science curriculum. However, New Zealand students are often faced with more than the usual problems when it comes to learning astronomy. Many of the astronomical publications they read are designed solely for the northern point of view. But, in contrast to an observer under northern skies, *everything seen by a New Zealand student is upside down.* The moon is upside down. Orion hangs by his feet, with his sword pointing upwards. Furthermore, a student in New Zealand facing the *south* celestial pole will see the stars rise on the *left* (left ascension?). All those convenient northern hemisphere clock drives have to be reversed if you are upside down!

There are other problems. The sun, moon, and planets are seen when New Zealand observers face north. Polaris is of course forever hidden. So is the Big Dipper. Deneb is on the northern horizon. Arcturus can be seen about 25° above the northwest horizon in *winter.* Orion, upside down, is visible 45° above the northern horizon in *summer.* Fomalhaut is seen near the zenith. New Zealanders find their celestial pole midway between Achernar and Beta Centauri. Alpha and Beta Centauri together form the "pointers" to Crux, the southern cross. In winter, New Zealanders looking up see right into the heart of the Milky Way galaxy. The star clouds of Sagittarius are directly overhead in July and August.

From a position of 40° south latitude, many of the classical constellations

are lost. Even the stories of the ancient zodiac constellations, which link *northern* seasons with star patterns, make little sense to a young New Zealander who is brought up with reversed seasons. Indeed, much of the ancient lore about the sky, derived as it is from cultures in the northern hemisphere, makes no sense at all "down under."

Fortunately, the astronomical knowledge of the original settlers from the north, the Polynesian navigators, was quite extensive[3]. New Zealand teachers do have opportunities to replace Chaldean and Greek mythologies with Maori legends as far as these legends pertain to the stars. Other basic astronomical facts, particularly those dealing with position and orientation, have to be re-written for the southern observer.

3. Public Observatories in New Zealand

Observatories open to the public are run for the most part by devoted amateur astronomers who freely offer their time and knowledge for the benefit of all. Young people are generally introduced to these observatories by their teachers or parents.

A notable example of an active amateur observatory is the Auckland Observatory in the North Island — home of the Auckland Astronomical Society. The Auckland Society was formed in 1922 by an enthusiastic group of amateur astronomers. Funds accumulated from private donations and from local business communities enabled the society to open an observatory in 1967. The Auckland Observatory houses a 50 cm (20") Zeiss Cassegrain reflector built in Jena, East Germany. More recently, the addition of photo-electric equipment and computer facilities has helped make the Auckland Observatory one of the most respected amateur research establishments in the southern hemisphere.

The Auckland Observatory runs a weekly program of evening lectures. There is a beginning course held annually, and training courses in the use of telescopes. Teachers can arrange daytime visits for school classes throughout the school year. There are programs throughout the summer. The observatory has a well-stocked bookshop. A library is open to members of the society. The Auckland Observatory is operated by a charitable trust. It receives no Government or Local Body support, and relies on donations and admission fees to provide and maintain an astronomical facility for the Auckland region.

In Wellington, the Carter Observatory overlooking Wellington harbor, is New Zealand's National Observatory. Supported by government funds, the facility houses two refractors; a 15 cm (6") telescope donated by the late Peter Read, and a 23 cm (9"). In addition, the Observatory operates a 40.6 cm (16") reflector at a field station on Black Birch Mountain in the South Island, 20 km south of Blenheim. A U.S. Naval observatory is located at the same site.

Carter Observatory publishes an annual Astronomical Handbook for New Zealand observers[4]. This publication is similar in conception to the Observer's Handbook published by the Royal Astronomical Society of Canada. Carter Observatory is open to visitors during the day. A series of evening lectures is given each

week from March through October.

Recent moves by the New Zealand government to close Carter Observatory on economic grounds were met by a storm of public protest. The government was persuaded to reverse its intentions.

4. The Ward Observatory

Ward Observatory was the first major astronomical observatory to be built in New Zealand. For many years Ward Observatory (originally known as the Wanganui Observatory) was *the* New Zealand Observatory. Opened in 1903, it is located in the city of Wanganui, (pop. 40,000) near the mouth of the Wanganui River on the west coast of the North Island of New Zealand, at latitude 40° south.

The observatory houses a 24 cm (9.5") refractor, built by Thomas Cooke in 1865. The mount for this Cooke refractor is a cast iron prototype of the new or modified English mount. After 85 years of continuous operation, this telescope is still the largest refractor in operation in New Zealand today.

As soon as the Cooke refractor was installed, Joseph Ward, founder and honorary director of the observatory, with the assistance of another Wanganui amateur, Thomas Allison, set to work to survey the southern sky for double stars. During the years 1903 to 1910, they discovered more than a hundred new pairs. Most are located between 50° and 80° south declination. This work was the first of many important contributions made by amateur astronomers in New Zealand. The Ward doubles found their way into the international catalogues under the designation "NZO" for New Zealand Observatory. The IDS lists a total of 88 NZO doubles[5].

Joseph Ward may not have foreseen how wise his choice of an instrument with a long 12 foot (367 cm) focal length really was. The refractor still provides excellent viewing despite the advent of modern street lights and an adjacent outdoor sports stadium. It now has a precision electric clock drive designed and built by members of the Wanganui Astronomical Society.

The successors to Joseph Ward continue both to maintain their own interest and development in astronomy while at the same time providing a public service in the middle of a busy city. Public viewing nights are held at the Ward Observatory on Monday nights, March through October. Meetings of the Wanganui Astronomical Society are held once a month, always with a lecture on a current topic of astronomical interest.

References

1. Blow, Graham L. "Astronomy in New Zealand." *Sky and Telescope* **63** (June, 1982), p. 555. See also *Sky and Telescope* **63**, p. 612.
2. The RASNZ publishes a quarterly journal *Southern Stars* containing reports and articles of interest to New Zealand astronomers.
3. Elsdon Best (1922), *Astronomical Knowledge of the Maori.* Dominion Museum publications, Wellington, New Zealand.

4. The *Carter Observatory Astronomical Handbook* for New Zealand observers is available from Carter Observatory, P.O. Box 2909, Wellington 1, New Zealand.
5. Jeffers, H.M. *et al.* (1963). *Index Catalogue of Visual Double Stars, 1961.0.* Lick Observatory.

Discussion

P.W. Hill: *Professional astronomers are extremely grateful for the work of New Zealand amateurs, particularly in the field of variable stars.*

SYDNEY OBSERVATORY GOES PUBLIC

N.R. Lomb and T. Wilson
Sydney Observatory, PO Box K346, Haymarket 2000, Australia

1. Sydney Observatory

In 1982, after a 124-year history of research, Sydney Observatory became a branch of a large local museum, the Museum of Applied Arts and Sciences. A four-year, million-dollar project was undertaken to restore the building and its grounds to their nineteenth century appearance. The services needed for a modern museum were also added. One of the larger areas became a modern lecture theater seating up to fifty people, with back projection video, film and slide projectors.

Exhibition space within the building is limited to eight rooms of approximately 200 m^2 total area. To overcome this lack of space, a proposal has been made for an extension to the rear of the building. An underground 100-seat planetarium is included in the proposal. There is a great need for this as there is no planetarium currently in Sydney.

2. Halley's Comet Exhibition

From January to May 1986 an exhibition on Halley's Comet was put on in a part of the Observatory building. In the first and main display area, visitors found themselves in a spaceship. This spaceship had spot lighting, synthesized music and a fluorescent background of stars and galaxies. Exhibits included:

- the written record from 1835 of the first (European) sighting of Halley's Comet in Australia and the telescope with which the observation was made;
- the telescope with which the Great Comet of 1861 was discovered;