

The RASNZ Variable Star Section and Variable Stars South

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Abstract The Variable Star Section of the Royal Astronomical Society of New Zealand (RASNZ-VSS) began in 1927 and has now been revived in the shape of Variable Stars South. This review introduces Variable Stars South (VSS), then continues by outlining some of the history of the RASNZ-VSS, discusses the more worthwhile achievements of the old RASNZ-VSS, and mentions some of the observers and others who contributed to those successes.

1. Introduction

Let's look a little at Variable Stars South (VSS) as it is in 2011 before beginning a review of the Royal Astronomical Society of New Zealand Variable Star Section (RASNZ-VSS) which it has rejuvenated—but in a rather different manner. History is most useful when it allows looking at other people's actions and providing an insight into what best to do in the future. Whilst the old Variable Star Section did very good work in producing charts, encouraging measures from members, and publishing these, it was weak in the area of communications with members at times by not making them feel an important part of the organisation. In spite of this it achieved outstanding results in variable star astronomy in the Southern Hemisphere. But we'd like to make variable star astronomy even more rewarding and enjoyable in the twenty-first century.

At New Plymouth in 2006 Pauline Loader, the acting coordinator of the old Section, convened a meeting to discuss what could be done about reviving variable star observing in this part of the world. We concluded that all observational material should be held in one area, in this case the International Database maintained by the AAVSO, and that the best role for a southern group would be to stimulate observations. The methods of achieving this were not clear at the time although a variety of ideas were discussed and thought about for the next couple of years.

Variable Stars South began early in 2009 when Thomas Richards offered his services as Director of a revived group to the parent body, the Royal Astronomical Society of New Zealand. He proposed that it should be largely a project-oriented organization with the emphasis upon astrophysics in that any

projects entered into to be designed to find and publish information about stars—not merely accumulate large numbers of measures of random targets. Variable Stars South furnishes reports of activities to the RASNZ each year but apart from that operates independently.

As well, information and communications with members and others is a vital part of the operation. Richards had set up the Austral Variable Star Observer Network (AVSON) website a few years previous to his appointment and at this moment the Variable Stars South website (www.variablestarsouth.org) offers information on projects and techniques and is being added to frequently. VSS also publishes a quarterly Newsletter.

Observations are the lifeblood of a variable star group. This is what it's all about. Our projects encourage these. Once analysed all observations become part of the AAVSO International Database (AID) and are available to a wide range of astronomers. In the short time we've been operating some papers have been published and several others are in progress.

The group is still feeling its way. Initially coordinators were set up in several areas—visual observing, long period variables (LPVs) (later changed to pulsating variables), cataclysmic variables, eclipsing binaries—but this proved unnecessarily complex. It now tends to operate on the basis of setting up groups when there is a demand, such as SPADES for eclipsing binaries, bright Cepheids which has partially evolved into a DSLR group, a recent eclipse of BL Telescopii and similar ideas which can be seen on the website.

2. Back to the beginning

New Zealand was a much different place in 1927. About one and a half million people were scattered over 103,000 square miles, with most living in the four main cities. Roads were poor and most travel was along the main railway which had a few branch lines. Coastal shipping was strong. There were few telephones but the mail service was good. Australia was a week away by boat, although the first crossing of the Tasman Sea by air in 1928 was not far away in time!

In this environment a young Frank Bateson persuaded the Royal Astronomical Society of New Zealand to allow him to set up a variable star observing section. Few people were much interested in astronomy—but Ron McIntosh in Auckland was looking at Jupiter and the Moon, Charles Michie of Kaitia was observing the Sun with some special equipment, and Ivan Thomsen was later to direct the Carter Observatory.

3. Early progress

The first circular appeared on July 27, 1928, and listed nineteen variable star targets. On September 12, 1928, a further twenty stars were listed in response to observers' requests. A review of the group appeared in 1944 when

the first *Memoir* was published. This mentioned a total of 35,379 observations from 1927 to 1940. From then on circulars listing the observations appeared at intervals. By the time of the Golden Jubilee in 1977 almost a million measures had been made by more than 400 observers.

Apart from Bateson another prolific early observer was Gordon Smith who contributed 15,827 of the measures quoted above. He was encouraged by an article of Alec Crust's (who wrote many articles about variable stars) in the *Dunedin Star* and made his first observation in September 1929. When observing became difficult in 1973 for health reasons he took over the recording until it became computerized in 1987.

On January 18, 1943, a new era began. Albert Jones (Figure 1) made his first measure of Nova Puppis 1942, after reading an article published in *Southern Stars* by Crust. Later Albert became interested in dwarf novae and prepared a chart for VW Hydri. Intrigued by its behavior, he checked out stars from Hoffmeister's list of suspected dwarf novae and observed Z Cha, EK TrA, and a few others. In the 1950s and early 1960s Jones' measures usually provided between 25% and 70% of the recorded observations. Later the contributions became more balanced.

One very good feature involved circulars relating to specific stars. Often these were merely summaries of observations for stars such as novae, but a few dealt with periods and changes in these and tried to understand why these happened. Simple stuff by today's standards but then today's range of detection and computing equipment, and the understanding of stellar evolution, didn't then exist. But it made people think a little about what they were observing.

4. The chart project

Charts and comparison stars have always been a problem to observers. In the south, star photographs of any type were scarce. Thus many of the Section's first published charts came from work by Jones—both in sketches of the area and sequences.

The upsurge in the 1960s saw a demand for more than the original published set of twelve stars. Bateson secured a grant from the International Astronomical Union (IAU) to produce charts of all variables brighter than a certain magnitude and south of 30 degrees south. This was to be self-funding so charts were sold to members in sets of fifty. Well over a thousand charts were produced in this manner. Comparisons were a problem as published values could differ up to half a magnitude dependent upon the source.

Jones, Ian Stranson, and Bateson began the chart task but later Mati Morel took over most of the work (Figure 2). Robert Winnet and Bruce Sumner also helped with many charts. Barry Menzies and Peter Gordon led the sequence-determining team at Auckland Observatory and produced many sequences in V, with B–V colors available. Pamela Kilmartin and Alan Gilmore also measured some sequences from Mt. John and occasionally professionals like Nicholas

Vogt or Brian Warner produced a sequence for a star of particular interest like EX Hydrae, an intermediate polar.

5. A decade of growth

The years 1966 to 1976 saw a dramatic change in the local variable star scene. One main catalyst to this was the opening of the Mt. John Observatory in 1965, which led to considerable interest in the Christchurch area. The Auckland Observatory also opened in 1967 and a strong variable star group was associated with this.

The Christchurch amateur group, led by Clive Rowe, decided to emulate Mt. John with photoelectric equipment—but of a more current design—which had interesting results which are described in another paper at this Centennial (see <http://www.variablestarsouth.org/index.php/member-publications/posters/149-aavso-centennial-conference-poster-paper-rasnz-photometry-section>).

On the visual scene the Auckland group was strong. Charts were obtained from Bateson, some meetings were held to discuss results, and about fifteen to twenty people, later more, began observing. Coincidentally, around this time Nova Delphini 1967 (HR Del) appeared and at third magnitude for some months it created considerable interest.

Discussions with Bateson continued at intervals and many Auckland observers, as well as observing LPVs, developed an interest in Cataclysmic Variables, a relatively new field where they were to make some useful contributions for many years.

Most of these new observers were members of the RASNZ and attended the Annual Conferences where informal discussions about variable star observing, both photoelectric and visual, attracted many amateurs in other areas of New Zealand. Many observers developed an interest in CVs using charts based upon Jones' work. Developments along similar lines took place in Australia.

6. IAU Colloquium 46

This colloquium celebrated fifty years of the RASNZ Variable Star Section. It was held in Hamilton from November 27 to December 1, 1978, and attracted eighty-one participants.

There were many well-known names: David Allen, M. K. V. Bappu (then IAU President), Barnes, Fabian, Feast, Gascoigne, Kron, and Keenan, Robinson and Schoembs; Shobbrook, Slee, Whelan, and Warner, who were all to help the Auckland Observatory; Smak, Sterken, Vogt, and Wood were others.

A small contingent of AAVSO people was also there: Clint Ford, Dorrit Hoffleit, Tom Cragg, and Danie Overbeek.

The Variable Star Section was well represented with Brian Marino, Stan Walker, Frank Bateson, Albert Jones, Arthur Page, John Beuning, Graham

Blow, Harold Kennedy, Bill Allen, and Mervyn Thomas all presenting papers or collaborating in them. But there were many other members there. A most enjoyable and informative gathering.

The first sessions related to Cataclysmic Variables were highlighted by a review by Brian Warner. Many of the astronomers mentioned above were working in this field and it was particularly interesting. At that time new discoveries were being made frequently, new observing techniques used, and the whole area was exciting and stimulating. Flare stars at that time came under this heading but they're a different type of object physically.

From there the timescale changed dramatically to red variables—Miras, LPVs, R CrBs and similar. These sessions were perhaps noteworthy for a north/south clash over pulsation modes in Miras and some interesting discussions. Cepheids also featured prominently.

Relatively high-speed variables of assorted types were discussed; modern photoelectric techniques had already produced a considerable amount of new observational material. Even eclipsing binaries were not overlooked. And, to follow up an earlier section of this paper, Clinton Ford outlined the then present work on AAVSO charts.

In all, sixty separate papers were presented and included in the proceedings: *Changing Trends in Variable Star Research* (1979), edited by F. M. Bateson, J. Smak, and I. Urch.

7. After the colloquium

The next few years were some of the most productive for New Zealand astronomy. The original photoelectric conference, PEP1, was held at Carter Observatory in 1976 and was followed by PEP2 in 1982 in Auckland, the Small Telescope Symposium in 1985 in Christchurch, as well as some easily accessible meetings in Eastern Australia, and PEP3 in Blenheim. The University of Canterbury set about building a 1-meter telescope for Mt. John Observatory and improving their spectrographic equipment.

The Carter Observatory set up the Black Birch outstation and transferred the Ruth Chrisp telescope to that site. The Auckland University became strongly involved with developing high-speed photoelectric equipment for use at Auckland Observatory and the other two major sites, Black Birch and Mt. John. The U.S. Naval Observatory also set up an outstation for a five-year project at Black Birch.

The Colloquium had been attended by many local variable star observers and the enthusiasm was contagious. Numbers of observations increased and Bateson's encouragement of observers to write articles for the *Communications* strengthened the astrophysical aspect of observer's ways of thinking. Now we not only observed the changes in brightness but thought more about why these were happening and modified the techniques to provide more and better information about the target stars.

8. The photoelectric separation

It was gradually becoming clear to the photoelectric observers that their presence in the Variable Star Section was a little awkward, perhaps unwanted. The Director did not understand what the capabilities of filtered photoelectric photometry were and tended to strongly favor the visual observers to the extent of failing to pass on PEP measures to researchers.

This led to the setting up of the Photometry Section of the RASNZ based upon the Auckland Photoelectric Observers' Group (APOG). The Photometry Section had considerable support from many astronomers. But it should have been an integral part of the RASNZ-VSS which would then have kept up more closely with technological developments. In retrospect the decline and almost disappearance of the VSS would not have occurred if Bateson had not forced this separation. The AAVSO has avoided this mistake, treating all observers and methods of observing as equally important.

9. Clouds on the horizon

The continued pressure of directing the Section began to affect Bateson's health in the 1980s. As well, his eyesight was failing. Whilst Ranald McIntosh, Albert Jones, and Mati Morel were assuming many of the responsibilities none of the other variable star observers wanted to lead the group unless Bateson would partially stand aside and allow a more member-interactive structure.

On the positive side McIntosh set up a computerised database in 1984 and began by loading data from monthly paper summaries by observers. By 1989 many observers were sending the data by mail on a disc each month. As well, Don Brunt of Murupara digitized over half a million observations from the archived records. These were included in the database and ultimately included in the AAVSO International Database.

Operation of the Section demanded time and space. Various ideas to resolve these problems were explored. To provide room at Headquarters much of the old literature on variable stars was sent to the Auckland Observatory. But publication of the *Communications* became very sporadic and offers by Gordon Herdman and Grant Christie to edit these were declined. Effectively the Section in the 1990s was operated by Jones, Morel, and McIntosh.

But even in these latter years useful research was done in collaboration with others. Karen Pollard from the University of Canterbury spent some time at "Headquarters" studying the records of R CrB and RV Tauri stars, and an analysis of eighty-eight Mira stars to explore what appeared to be period changes but which were actually alternations of periods was presented by Peter Cottrell (1998)—coauthors, Jones, Bateson, and Walker—at the IAU General Assembly in 1997. Peter Williams, McIntosh, and Morel contributed articles for the *Communications*.

In 1989 Bateson attended one of the very popular PEP Conferences, PEP3

at Blenheim. At this event several speakers paid tribute to his work and the very profitable relationship between the visual observers and photoelectric photometry. This meeting effectively was his retirement although in the absence of a formal notification the Section continued under his direction, although not effectively and many observers were lost. Fortunately many continued to observe and submitted their measures directly to the AAVSO.

10. A final meeting of the old variable star section

In 2004 the RASNZ sponsored a meeting to celebrate Bateson's eighty years in astronomy. Many observers, friends, and family attended as did Brian Warner (Figure 3). Papers from this meeting were published in *Southern Stars* (Vol. 44, No. 1) in 2005. At this meeting Bateson announced his retirement, thus clearing the way for a much anticipated revival of the Section.

11. The revival in the new century

The continued operation of the Section in the 1990s can be attributed to the dedication of three people: Albert Jones, Mati Morel, and Ranald McIntosh, with support from the Director's secretary, Maureen Phizacklea.

Whilst Jones had achieved the 100,000 visual observations target many years before (and has since passed the 500,000 visual mark) about this time two Australian observers, Rod Stubbings (Figure 4) and Peter Williams (Figure 5), also achieved this milestone, making three members of a rather select group from the Section.

After the 2004 meeting Pauline Loader, Secretary of the RASNZ, assumed the role of coordinator. Some circulars were published and requests from researchers placed on the RASNZ website but it was not until Conference 2006 (where AAVSO Director Arne Henden was a welcome visitor) that any formal attempt was made to seek a way forward.

In mid-2008 Walker offered to oversee the publication of a quarterly newsletter for the next two years and the first of these appeared in November of that year.

Shortly thereafter Tom Richards discussed with Pauline Loader and interested others the possibility of him assuming the role of Director in a new organization, Variable Stars South, operated in a more friendly and project-oriented manner than the old RASNZ VSS. Richards was appointed in early 2009 and we were under way again!

12. What did the RASNZ VSS achieve?

We should conclude by looking at what the Section achieved. In simple terms it added about 1.5 million visual observations of variable stars to the AAVSO International Database, produced charts for about 2,000 southern

variables, and put together good comparison star sequences for many of these. Numbers are hard to be certain about as many observations were made of stars not on the Section's official listing and other observers, mainly Tom Cragg and Danie Overbeek of the AAVSO, supplied both the RASNZ-VSS and the AAVSO with measures. Some members of the BAA did the same.

Most importantly, it persuaded many people that good science could be carried out with a small telescope and simple equipment. It provided a sense of belonging to a group with a worthwhile purpose—not just celestial sightseeing.

It also created a situation where observers were encouraged to do more than just observe: it challenged them to find out what the observations meant and to understand what the stars were doing and why. As well, in offering research projects which needed more than visual measures, it saw the adoption of techniques such as photography and, more importantly, UBV photometry. But it was not really involved in CCD photometry. Many of the PEP people inspired by the old Variable Star Section now support the Center for Backyard Astrophysics (CBA) and other specialized groups such as those for Gamma-Ray Bursters (GRBs) and microlens searches for planets.

Many of the visual observers collaborated in projects, both in New Zealand and overseas, often supplying information about what various southern stars were doing at the moment. This was very helpful in the early days of CV observing when almost everything about them was new and little observed. However, the longer period stars received their share of attention as well.

The 1978 Colloquium introduced many amateurs in New Zealand and Australia to professionals either using their observations or looking at the same stars with similar equipment and, in its way, led to the successful PEP conferences. These are discussed in a separate poster paper which is essential to understanding the amateur variable star scene in our part of the world.

The authors and Tom Richards are pleased, as are many others, to have been part of the local variable star scene and look forward to even better things in the future.

References

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Figure 1. Albert Jones, the Section's most prolific observer, with more than 500,000 visual observations to his credit, relaxing in his office. Courtesy John-Paul Pochin.



Figure 2. Frank Bateson with Mati Morel, who produced most of the charts, and Peter Williams, with more than 100,000 visual observations to his credit.



Figure 3. Frank Bateson's farewell conference celebrating his eighty years of astronomy. Frank is seated center front with his daughter Audrey. To Audrey's right are Carolyn and Albert Jones, John Toone representing the BAA, and Interim Director Elizabeth Waagen representing the AAVSO; at the other end of the row is Brian Loader, RASNZ President, and Brian Warner, University of Cape Town. Tauranga, New Zealand, December 4, 2004.



Figure 4. Another prolific observer, Rod Stubbings, who now has made over 200,000 visual observations.



Figure 5. Peter Williams, who has passed the 100,000 visual observations mark.