Albert Francis Arthur Lofley Jones, DSc., OBE, FRAS, FRASNZ (1920–2013)

John Toone

'While a child, I was fascinated by the stars and wanted to know about them but did not know anyone who could help me. The stars were both literally and metaphorically above my head, so all I could hope to do would be to learn the names and places in the sky of the constellations and the stars comprising them, and of course the zodiac (ecliptic) and where to look for the planets. I had no pretensions of making astronomy as my main interest – it could only be just as a sideline'. – *Albert Jones, 2005*.[1]

Introduction

Albert Jones is the most prolific variable star observer in the history of observational astronomy, and few involved in this important branch of work would question his unofficial title of the greatest visual observer of variable stars of all time. This assessment is based on the fact that by the time he ceased observing in 2011, he had generated approximately 180,000 more high quality visual observations than any other individual observer. In addition, he was the first observer to attain the demanding milestones of 200,000 and 300,000 observations, and the only person (up to 2015) to have reached the coveted milestones of 400,000 and 500,000 observations. By 2015 only four other observers had made even half of Albert Jones' total. His data, discoveries, dedication, endurance and overall achievements are quite extraordinary and this is recognised by all those involved in variable star work, both professional and amateur, over the past fifty years.

This paper is a summary biographical account of the life and work of Albert Jones. It was presented at the meeting of the British Astronomical Association Variable Star Section (BAA VSS) held in York on 2014 June 21.

Ancestry

A. F. A. L. Jones was born at 623 Worcester Street, Linwood, Christchurch, New Zealand (Figure 1) on 1920 August 9. He was the son of Edward Lofley Jones and Clara Martha Fisher, who had married in 1910 (Figure 3). Edward in turn was the second son of John Richmond Primrose Hull Jones and Sarah Ann Lofley, who originally resided in Hull, United Kingdom and had been married at Sculcoates Church (Figure 2) in 1869. J. R. P. H. Jones was a grinder by profession and was recruited by John Brogden & Sons Ltd, who provided British labour for construction of some of the earliest railway lines in New Zealand.[2] The Jones family, including one year old John Richmond (elder brother of Edward Lofley), migrated to Wellington, New Zealand in 1872 aboard the 602-ton iron barque *Schiehallion*.[3] The voyage took 87 days and was described as follows:

'Left London on the 13th April, and crossed the equator on the 7th

Figure 1. Albert Jones's birthplace, 623 Worcester Street, Linwood, Christchurch. *Photo by Peter Williams, 2014 November 26.*

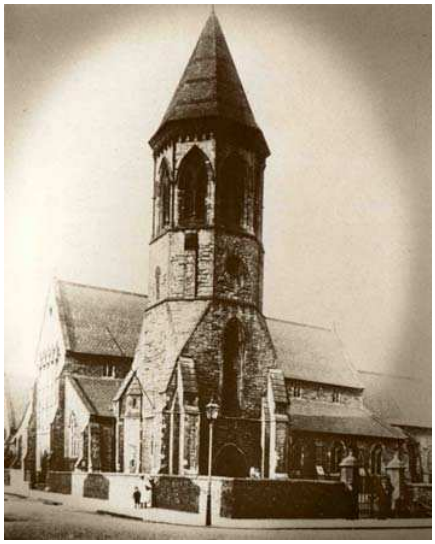

Figure 2. St Pauls Church, Sculcoates, Hull, Yorkshire, pictured around 1900. *Photo supplied by Kath Burrows from the East Riding Archives.*

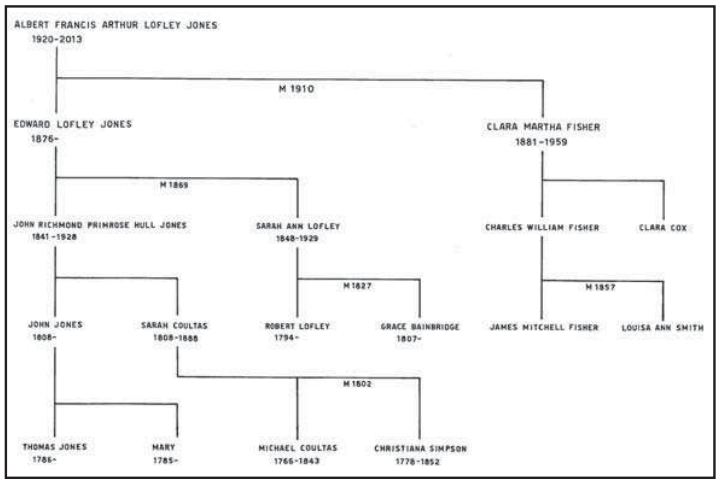

Figure 3. Jones's family tree, constructed from a limited internet search and a visit to the East Riding Archives in Beverley, Yorkshire.

> May. Had very favourable winds to the meridian of the Cape, which was crossed on the 24th May, after which had indifferent winds until Cape Farewell was sighted on the 7th July, and arrived here today (9th July). No deaths have occurred on the passage but one birth and the passengers are all well.'[4]

According to the *Schiehallion* passenger manifest J. R. P. H. Jones's middle name of 'Primrose' had been dropped, which was probably a sensible precaution on a ship laden with navvies and labourers.

In the 1841 UK census Jones's great-great-grandparents Thomas and Mary Jones are listed as living by independent means in North Myton, Kingston-upon-Hull with four grown-up children (including Jones's great-grandfather John Jones, a shoemaker) and two female domestic servants. Albert Jones's ancestry on his father's side can be traced to Yorkshire, the county that had earlier accommodated variable star legends John Goodricke and Edward Piggott towards the end of the 18th century.

Domestic life and professional career

Albert Jones had an elder step-brother Percy Edward (1903–2001) whose mother died when he was aged five, an older sister Iris Clara Lofley (1913–2001) who Jones called Goldie, and a younger brother Eric Ionic Lofley (1923–2000). Jones's mother Clara had two brothers, Albert Joseph Fisher and Francis Charles Fisher, who lived with their families at nearby 617 and 620 Worcester Street, Christchurch, respectively. Jones's father Edward had five brothers and two sisters including one brother christened Violet, (who changed his name to Victor, a more suitable name for a professional soldier and fitness fanatic known as 'Scorcher Jones') after John Richmond Primrose Hull Jones's elder brother.

Jones was initially educated at North Linwood Primary School in Christchurch in 1925–1926. In October 1926 the family moved to Timaru (eventually settling at 40 Trafalgar Street) where he attended Waimataitai Primary School and passed the proficiency exam in 1932. From 1933 to 1936 he attended Timaru Boys High School where he passed the matriculation and school certificate exams, and where his favourite subject was chemistry.[5]

Despite doing well at school and qualifying for university he chose instead to work (unemployment was widespread at the time following the worldwide economic depression) and further his education by reading books. It was through book reading that his initial interest in astronomy developed. This interest was enhanced during weekend fishing trips with his father to the Rakaia River, where conditions were ideal for astronomy. The fishing trips would continue until 1963, just prior to his moving to Nelson.

In adult life Jones worked at Timaru Milling Company under his father's management from 1937 to 1963. Following the outbreak of World War II in Europe he joined the Home Guard in 1940 and later the 2nd Battalion Canterbury Regiment, but was classified unfit for overseas service in 1942 having sustained foot injuries during long marches. (The medical examination concluded that Private Jones as a miller would be more useful to the war effort by producing food for both the armed forces and the general population.)

However, life for the remaining war years was not easy, having to work from 8 a.m. to 9 p.m. on weekdays, maintenance at the mill on Saturday and Home Guard duties on Sundays. With his father's overdue retirement (he was aged 86) in 1963, Jones was offered the job of Head Miller but he turned it down in favour of moving to Nelson in 1964 and running a grocer's shop with his brother Eric and sister Goldie. Later Jones was offered a job at the Carter Observatory (including the Directorship) and also a site testing job at Mt John by Frank Bateson, but he turned them all down. He was content with the grocery business which proved to be successful, and he retired aged 65 in 1985.[6]

Jones was twice married. He met his first wife Ann through Nelson Astronomical Society and they were married in February 1973. Unfortunately this would prove to be short lived and they separated in 1979. The failure of this first marriage had a profoundly negative effect upon Jones, but this was happily redressed when he met Carolyn at Nelson Tramping Club. They married in 1984. Frank Bateson described Carolyn as 'Albert's public relations officer' and during a presentation at the Royal Astronomical Society of New Zealand (RASNZ) meeting held at Tauranga in 2004 there were gasps from the audience when Jones stated that his greatest discovery was his wife Carolyn.

When Jones was observing in later life with the aid of a walking frame Carolyn used to help him get set up and then check on his condition regularly to ensure he was safe and well. In 2002 Jones was offered another asteroid to be named after him (he already had one named in 1988) but he suggested instead it be named Carolyn. Since there was already an asteroid named Carolyn, a combination of his wife's first two names was chosen and the asteroid was named **(9171) Carolyndiane.**

Initial steps in astronomy and the NZAS

Although astronomy was not part of the school curriculum, one of the geography teachers at Timaru Boys High School had an interest and taught the pupils about the planets. After leaving school Jones was fascinated by astronomy books and learned to recognise the constellations, especially those of the zodiac in order to identify planets.

In 1939 Jones responded to a newspaper appeal by Murray Geddes, the first Director of the Carter Observatory at Wellington, and submitted detailed reports of aurorae that he and his father had seen. In 1941 Jones was elected as a member of the New Zealand Astronomical Society (NZAS), later to become the RASNZ, and he started to receive the journal *Southern Stars*.

The 1942 December issue of *Southern Stars* included an article by A. G. C. Crust on the bright nova in Puppis discovered earlier that year (Nova CP Pup) which contained a chart and instructions on how to make magnitude estimates. Armed with this information Jones made his first variable star observation on 1943 January 18. He continued to monitor the fading nova and sent the observations to Crust; the first 50 were deemed good enough to be published in the journal. From then onwards Jones was hooked on variable star observing and launched his serious observing career.[7]

Figure 4. The 5-inch reflector used by Jones for his first variable star observations in 1943. *Photo supplied by Bob Marriott.*

Frank Bateson initially established the Variable Star Section (VSS) of the NZAS in 1927 but the work of the Section was sus-

pended during World War II as Bateson served in the Royal New Zealand Navy. When Bateson returned to civilian life in 1944 he was contacted by Jones, who requested some variable star charts. Bateson sent a batch of 25 charts, but Jones soon needed more and a further 68 were supplied. These covered mainly Mira-type variables, but were later supplemented by some Irregular and R Coronae Borealis-type stars. Triggered by Jones's infectious enthusiasm the VSS NZAS was re-launched in late 1944 and at that time its sole members were Bateson and Jones.

Jones was elected as a member of the British Astronomical Association New South Wales Branch on 1945 June 27 and on 1947 January 10 he was elected a Fellow of the Royal Astronomical Society (RAS). In 1964 he became one of the first four Fellows of the RASNZ and the following year he also became a member of the International Astronomical Union (IAU).

Home made telescopes and 'Lesbet'

Figure 5. Jones pictured with his 5-inch refractor at Timaru in 1947. With this telescope he discovered Comet 1946h. *Photo from Alan Gilmore's collection supplied by Bob Evans.*

In 1938 Jones constructed his first telescope from a lens kit and paper wrapped around a cardboard tube. The lens kit alone cost the equivalent of five loaves of bread. This telescope was very crude and the quality was poor, but it did allow him to see objects not visible to the naked eye such as Saturn's rings and the Orion Nebula. His first purchased telescope was a 5-inch f/15 Calver reflector in 1941 (Figure 4) which he used for his initial variable star observations. In 1945 he purchased a 5.3-inch refractor (Figure 5) with which he discovered Comet 1946h. Shortly afterwards he constructed an 8-inch Newtonian reflector with a mirror supplied by J. T. Ward.

Then in 1948 he constructed a 12.5-inch f/5 Newtonian reflector (Figure 6) that he named 'Lesbet', after Leslie Comrie (Director of the BAA Computing Section 1919–1922, see Figure 7) and his wife Betty who was responsible for sourcing and transporting the primary mirror from the United Kingdom in late 1947. The primary mirror cost £75, was made from Hysil glass and was one of the first orders for the company of Cox, Hargreaves & Thomas Ltd. Frederick Hargreaves (BAA President 1942–1944, see Figure 8) ground the mirror. Jones made the greatest proportion of his observations with this telescope between 1948 February and 2010 May.

The Lesbet telescope had an equatorial mount (originally intended for observing Jupiter) but since it was on castors it was not fixed (Figure 9). This enabled Jones to use whatever polar direction gave him the most comfortable position for looking through the eyepiece. Lesbet was equipped with 45mm and 78mm refractor finder 'scopes (Figure 10) which were used to observe some of the brighter variable stars. In 2011 April the 'Lesbet' telescope was transferred into the archives of the Nelson Provincial Museum.[8] The final telescope that Jones used up to 2011 August was a 12.5-inch f/5 Dobsonian provided by Alan Gilmore & Pamela Kilmartin. This was more user-friendly than Lesbet but it could only be operated with the aid of a walking frame due to Jones's frail condition at the age of 90.

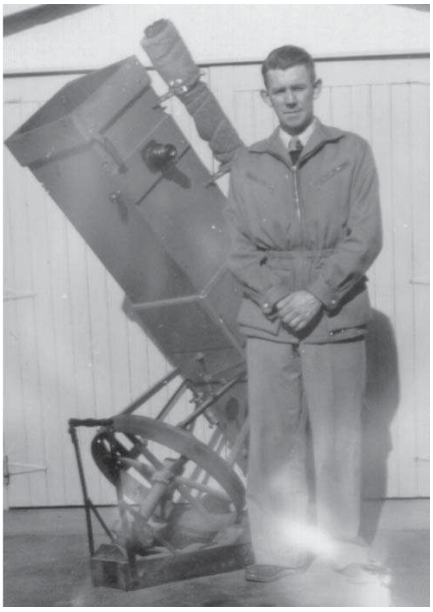

Figure 6. Jones pictured with the newly constructed 12.5-inch reflector 'Lesbet' at Timaru in 1949. *Photo supplied by Chris Sterken.*

Variable star work

In the 1950s Albert Jones took the observation of variable stars to a new level. Until that time the most prolific observer had been Charles Butterworth of the BAA VSS and Association Francaise des Observateurs d'Etoiles Variables (AFOEV).[9] In total Butterworth made 105,000 observations between 1911 and 1941, and his annual output peaked at slightly more than 5,000 observations in the early 1930s. This rate, with which any respectable variable star observer of the modern era would be satisfied, seems small compared to Jones's average annual output of 10,000 in the late 1950s and his eventual final total that exceeded 500,000 observations. At his peak Jones would accrue 13,000 observations in a good year, a figure comparable to the most productive modern day visual observers who are fortunate to have many more variable stars (with ready-made comparison star sequences) available that warrant continuous/nightly monitoring.

Jones observed in both the evening and morning to ensure maximum coverage of all the stars he monitored. This meant he observed up to 6 hours per night when it was totally clear. Partly clear nights were also exploited and small gaps in the cloud were not wasted because he knew that all parts of the sky contain variable stars. This approach was necessary because the weather in New Zealand is similar to the United Kingdom in that it is rarely

Figure 7. Leslie John Comrie FRS (1893–1950), Director of the BAA Computing Section 1919–1922, and Superintendent at HM Nautical Almanac Office 1926–1936. Comrie transported the 12.5-inch primary mirror of Jones's telescope 'Lesbet' from the UK to New Zealand.

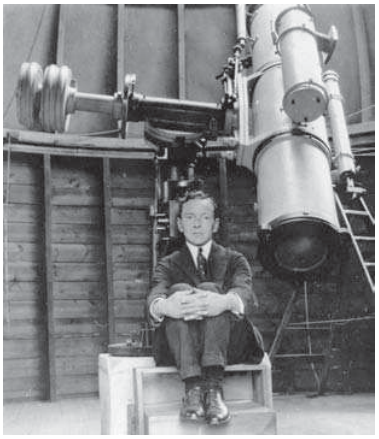

Figure 8. Frederick James Hargreaves (1891–1970), BAA President 1942–1944 and RAS Vice President 1943–1945. Hargreaves configured the primary 12.5-inch mirror of 'Lesbet'. *Photo supplied by Bob Marriott.*

fully clear for prolonged periods.

Jones's visual observations were made to a very high standard. It is generally accepted that visual photometry is accurate under favourable conditions to about one tenth of a magnitude, but Jones's internal consistency (prior to age 70) showed a standard deviation of one twentieth of a magnitude.[10] Jones understood the need for accuracy in order to detect minor variation in some of the stars he was monitoring and described his technique as follows:

'To make estimates, each star is brought to the centre of the field before noting its brightness. If the variable and a comparison star are not far apart, the observer's head is oriented so that the line joining the stars is parallel to the eyes. Another issue to be wary of is that the star nearest the observer's nose may seem a little brighter than is the case. Observations of red stars are not made in conditions of bright moonlight. When observing a red star it is advisable to make quick glances, otherwise visual observers may over-estimate its brightness. When going to the telescope, every effort is made not to recall any previous measurements.'[11]

The above technique certainly helps to minimise the potential of observational errors arising from position angle, colour & bias and should be considered as 'golden rules' for all visual observers of variable stars.

In order to undertake visual photometry of variable stars an essential tool of the observer is a finder chart and reliable sequence of comparison stars. Accurate finder charts and sequences for southern variables were in limited supply in the 1940s so a number of stars were identified and monitored using sketches and lettered sequences prepared visually by Jones himself. The situation improved in the 1960s when the Cape Observatory produced some photo-visual sequences, and in the 1990s when accurate V photometry became available through CCD measurements from ground and satellite based telescopes. As a consequence of the updating of sequences in the early 21st century to adopt accurate photometry, many of Jones's earlier observations required conversion to the modern V photometric scale.

The types of variable stars that Jones monitored regularly were dwarf novae, R Coronae Borealis, recurrent novae and symbiotic stars. He also frequently monitored S Doradus together with various other blue stars in the LMC and SMC (Large & Small Magellanic Clouds). Red stars such as irregular, semi-regular and Mira types (Figure 11) were observed less frequently.

Figure 9. Jones pictured with 'Lesbet' at Nelson in 1987. *Photo supplied by Ashley Marles from Carolyn Jones' private collection.*

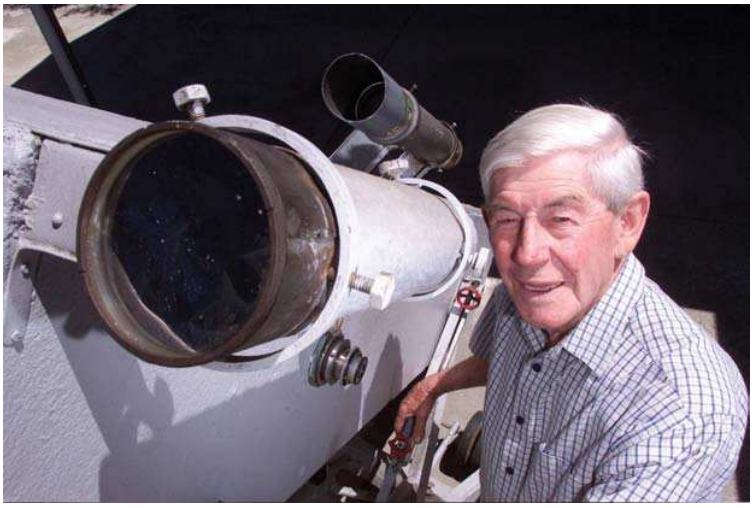

Figure 10. The 78mm & 45mm finder telescopes on 'Lesbet'. Jones used these not only as finder 'scopes but also for observing the variable stars that were too bright for the primary telescope.

During his routine variable star work Jones has made a number of discoveries. Firstly, he was responsible for the detection of the outbursts of the recurrent novae T Pyxis (Figure 12), V1017 Sagittarii and V3890 Sgr in 1966, 1973 and 1990 respectively. He was also the first observer to spot the bright flare-up of EX Lupi in 1955–'57. HD5980 had an outburst in 1994 and HDE269006, HDE269582 & GSC 9162 0727 all flared up in 2009–2010. In addition, Jones's work on Z Circini led to it being re-classified from R CrB to Mira class[12] and HDE326823 was named V1104 Scorpii on the basis of his observations. Several suspect variables that he monitored right up to 2010 are still awaiting confirmation and acceptance and do not yet have official variable star designations.

VW Hydri and other cataclysmic variables

Whilst visual monitoring of dwarf novae had begun in the northern hemisphere in the mid-19th century, no one did similar work from the southern hemisphere prior to Jones in the 1950s. The first dwarf nova that Jones observed was CN Orionis, but he soon turned his attention to VW Hyi. This variable was discovered by photographic means in 1932 but had never been observed visually until Jones caught it in outburst on 1953 August 6.

VW Hyi is today known as the brightest dwarf nova of the UGSU sub-class and Jones's pioneering work in the years 1953–1955 (Figure 13) confirmed its UG classification and that it exhibited two types of outbursts, normal and super-outburst.[13] Prior to 1953 little was known about this star and Jones had to draw his own chart (Figure 14) to identify it and develop a sequence by visual means, in order to conduct regular monitoring. The reports of the VSS RASNZ in the period 1956 to 1977 on VW Hyi almost exclusively relied upon Jones's systematic observations. These observations enabled its UGSU status to be firmly established together with its range, period, supercycle, outburst forms and cyclic relationship.[14]

The observations were also sufficiently numerous and accurate enough to define for the first time the true overall shape of the UGSU super-outburst, that includes a normal outburst triggering and merging to differing extents with the super-outburst. This would not be detected in any

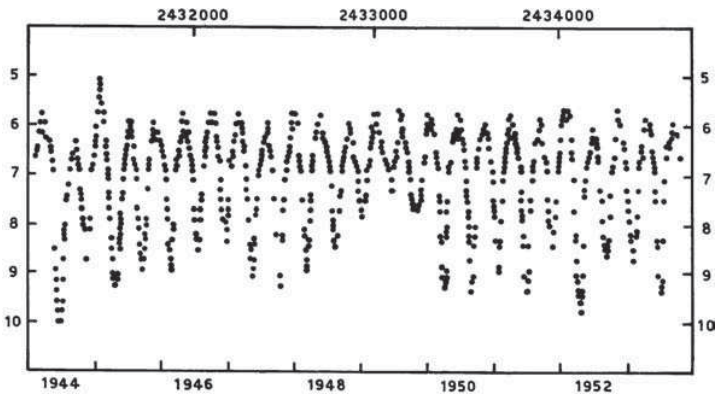

Figure 11. Jones's lightcurve of S Carinae (Mira type variable) from 1944 to 1953.

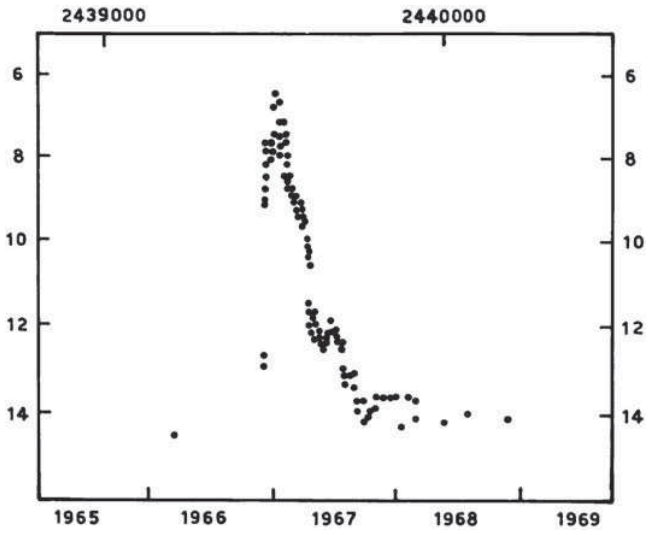

Figure 12. Jones's lightcurve of T Pyx from 1965 to 1969. Jones was the first to detect this recurrent nova in outburst on 1966 December 7 after nearly 12 years of monitoring. The next outburst would not occur until 2011 April.

other star until CCD measures were taken of T Leonis (QZ Virginii) in 1993[15] and it was not until intense photometry was undertaken by the NASA *Kepler* mission in 2010–2012 that this key aspect of UGSU stars could be seen in detail.[16] The lightcurves showing the VW Hyi super-outburst derived largely from Jones's visual data published in 1977 are remarkably similar to that recorded by *Kepler* mission photometry in 2012.

Jones also did pioneering work on other southern hemisphere dwarf novae such as Z Chamaeleontis and EK Triangulum Australis. Z Cha was known as S4893 (Sonneberg variable derived from photographic plates) until Jones detected it in outburst on 1954 July 25. The same applied to EK TrA (S5005) that was observed by Jones to be in outburst on 1954 October 17. When Brun & Petit prepared their 'Atlas of U Geminorum Stars' in 1957[17] they relied heavily on Jones's input for charts and data for the southern hemisphere dwarf novae. Jones summarised his early work on cataclysmic variables as follows:

'Looking back, I realise how lucky I was to be 'in at the start' of monitoring CVs. Frank [Bateson] had given me a chart of a star in Orion, and also shown on the chart was CN Ori, so I had a go at that too. Then I read that VW Hyi was the brightest star of that class in the southern sky, but there did not seem to be any charts for it although a French bulletin showed a finder chart showing

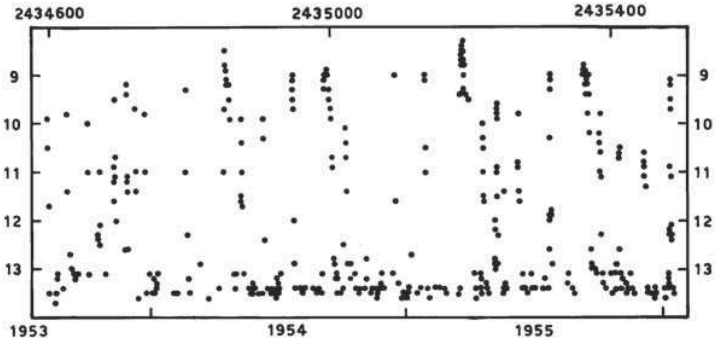

Figure 13. Jones's lightcurve of VW Hyi from 1953 to 1956. Throughout this period Jones was the only observer monitoring this famous dwarf nova.

only the brighter stars. Evidently VW Hyi had been discovered on Harvard patrol plates but had not been observed visually. Luckily I had been able to purchase an old set of the CPD catalogues, so I had a go at plotting a chart showing the CPD stars. The very next night was clear, and when I looked, VW Hyi was at maximum and faded over the following days – great fun.

'Later I told Frank what I had been up to, and started sending him observations of VW Hyi. Added some more stars of that type – one, WW Sgr proved to be a long period variable. Around that time I was corresponding with some French amateurs, and two of them Brun and Petit were compiling an Atlas of U Gem stars (which was published later in a Russian variable star journal), and Monsieur Brun asked me to plot a number of southern fields because he did not have catalogues for southern regions. Some were known UGs while some were only suspected and had only 'temporary' numbers from Sonneberg Observatory. Hoffmeister had gone to South Africa, taken lots of photos then taken them back to

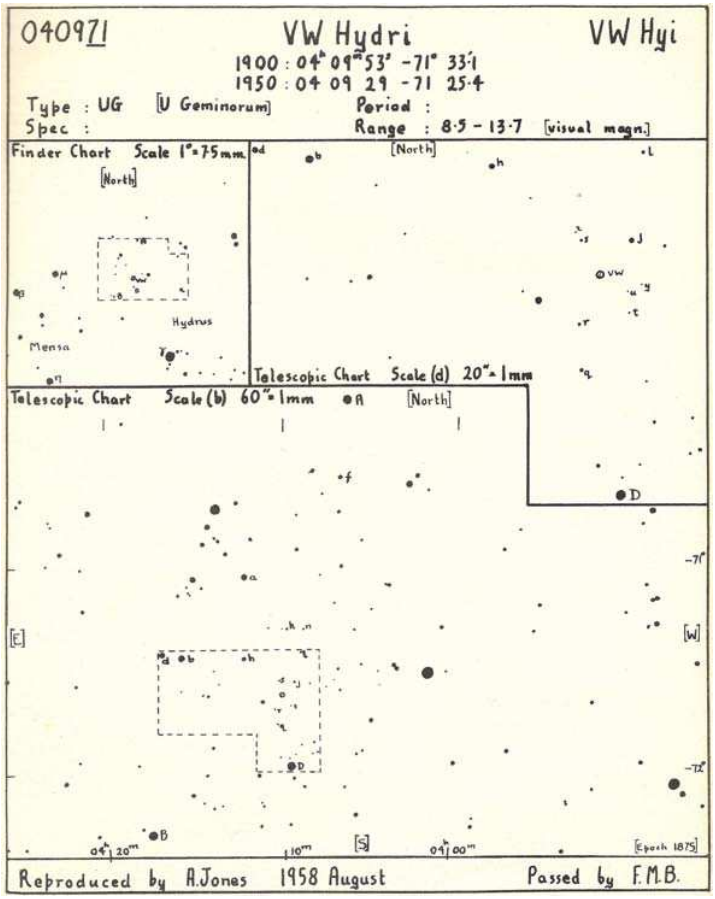

Figure 14. Jones's chart of VW Hyi drawn in 1958. This was an update of his original chart drawn in 1954.

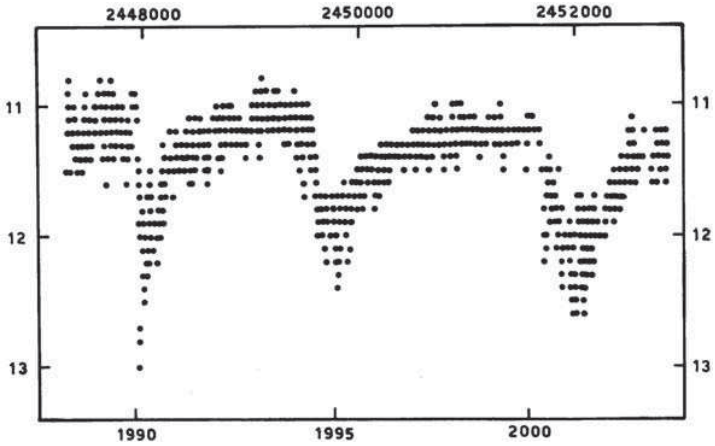

Figure 15. Jones's lightcurve of V837 Ara from 1988 to 2004. This is the Wolf–Rayet central star of the planetary nebula PK 332.9-09.9.

Sonneberg to study them. On some fields he found only one image, so suspected those images might be of U Gem stars (short maxima). So I kept watch just in case. Weeks and weeks passed then first Z Cha showed up and later EK TrA. Some of the suspected variables were found not to be UGs. Anyway I seemed to have the field to myself at first, then others became interested which was good, as that meant less chance of outbursts being missed if I had poor weather'.[18]

Scientific analysis and papers

With an observing career approaching 70 years, Jones's observations provide a unique and internally consistent dataset that has enormous potential for researchers seeking to undertake long term analysis of southern hemisphere variable stars. Jones fully understood this and from the mid 1990s onwards he collaborated with a number of professional astronomers who evaluated his data and published a series of papers. Some examples of such collaboration follow:

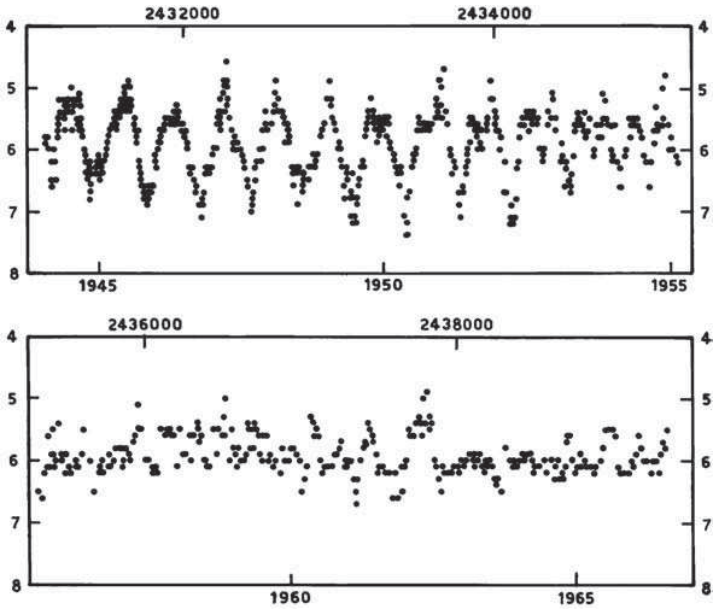

Figure 16. Jones's lightcurve of R Dor from 1944 to 1967. The upper diagram shows regular and extensive variation while the lower diagram illustrates a change to irregular behaviour with a limited range.

V837 Ara

Jones investigated two Wolf–Rayet central stars of planetary nebulae that were suspected to be variable and similar to V348 Sgr. Here is his description of what ensued:

'I saw a paper that described 3 other objects similar to V348 Sgr so I wanted to have a go at them, one was too far north but CPD-56 8032 (in Ara) and He3-1044 (Lupus) are nicely placed. He3-1044 does not do much but CPD-56 8032 had fades like an RCB. In 1993, at a conference of the RASNZ, I told Warrick Lawson that I had been keeping an eye on CPD-56 8032 and it had varied. He asked me for my data and as a result it became named as V837 Ara – yippee!'[19]

Jones went on to collaborate with a group of professional astronomers who correlated Hubble Space Telescope spectroscopy and ground-based radial velocity measures with Jones's visual lightcurve (Figure 15) and concluded that the Wolf–Rayet star was in fact a binary.[20]

R Doradus

Jones's data from 1944 to 1967 (Figure 16) indicated that the amplitude of this red variable had reduced significantly over time. At the Centenary Meeting of the BAA VSS in 1991 Albert Zijlstra gave a presentation explaining that a pulsation mode change had occurred; this was derived solely from Jones's observations. In 1998 Zijlstra's analysis was published as a full paper in MNRAS with Jones as a co-author.[21]

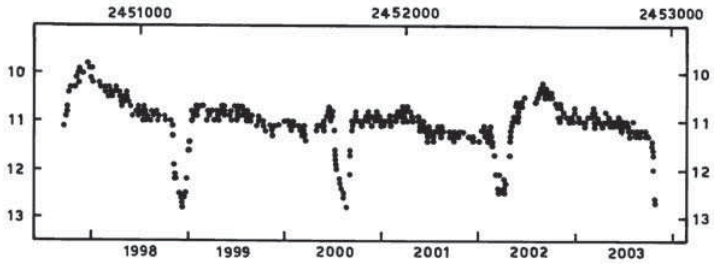

Figure 17. Jones's lightcurve of AR Pav (eclipsing symbiotic binary) from 1997 to 2003.

AR Pavonis

AR Pav is an eclipsing symbiotic binary with an orbital period of 605 days that shows dramatic variations out of eclipse. Although photographic measurements were available going back to 1889 the records were fragmentary and the best available data (up to 2004) that illustrated the true nature of the variation were Jones's visual data that commenced in 1982. It was identified from Jones's observations that AR Pav entered a low (less active) state in the years 1999–2002 (Figure 17) that

Table 1. The first observers to reach the 100,000 observations milestone

Year	*Observer*	*Country*	*Duration (years)*
1939	Charles Butterworth	UK	29
1957	Albert Jones	NZ	15
1958	Reginald de Kock	SA	25
1960	Cyrus Fernald	USA	24
1962	Leslie Peltier	USA	45

This table lists the first five variable star observers to achieve the coveted 100,000 observations milestone. It is notable that Jones took considerably less time to achieve this than the other observers.

Figure 18. Some of the attendees at the AAVSO meeting in Boston in 1957 October. Frank Bateson is centre stage with AAVSO Director Margaret Mayall. Dorrit Hoffleit meanwhile is displaying the headline news: 'Russians Launch Space Satellite'. *Photo supplied by Michael Saladyga.*

covered two orbital cycles.[22]

There were many other instances of collaboration with professional astronomers but the above is sufficient to demonstrate what can be achieved by pro/am collaboration when the visual observer (Jones) has the respect of the professional astronomical community.

Number of observations and milestones

Jones never counted his variable star observations and really had no idea how many he actually made, neither annually, in total or when he reached major observing milestones. He considered observing statistics and records to be unimportant. It is known however, that he made his first observation on 1943 January 18 (aged 22) and that he reached the 100,000 milestone sometime before the American Association of Variable Star Observers (AAVSO) meeting held at Boston in October 1957 (aged 37 and co-incident with the launch of *Sputnik 1*). Frank Bateson, Director of the VSS RASNZ, attended that meeting (Figure 18) and announced that Jones was the leading observer for the VSS RASNZ and had generated 100,000 out of a total of 250,000 observations.[23]

This meant that Jones had become only the second observer to reach 100,000 observations following BAA VSS observer Charles Butterworth in 1939. Shortly afterwards the 100,000 observation milestone was also achieved by Reginald de Kock (Astronomical Society of South Africa VSS) in 1958 and Cyrus Fernald (AAVSO) in 1960 (Table 1). For an observer to reach the 100,000 milestone in less than 15 years is quite extraordinary and has only been done in less time by Hiroaki Narumi, Taichi Kato and Rod Stubbings. By 2012 only a further seven observers had reached 200,000 observations[24] and two observers had attained 300,000 (Table 2). Jones's final observation was of V766 Cen on 2011 August 31 when aged 91.

Since Jones did not keep a count of his observations the best means of obtaining a reasonably accurate estimate of the total quantity is to examine the publications and databases of the amateur variable star associations, in particular the VSS RASNZ and more latterly the AAVSO.

Table 2. The leading visual variable star observers

No. of obs.	*Observer*	*Country*	*Years*	*Annual average*
515,000	Albert Jones	NZ	1943–2011	7,500
337,000	Hiroaki Narumi	Japan	1975–2011	9,200
307,000	Taichi Kato	Japan	1975–2011	8,100
292,000	Danie Overbeek	SA	1952–2007	5,300
245,000	Gary Poyner	UK	1975–2011	6,800

This table lists the leading five observers' totals at the time Jones ceased observing in 2011 August. Jones's annual average is similar to the three observers who began work in 1975 and who are still active.

It is estimated that between 1943 and 2011 Jones made approximately **515,000** observations of variable stars. This estimate is based upon the following:

- **100,000** observations were made between 1943 and 1957 according to Bateson's statement at the October 1957 AAVSO meeting.
- Bateson in 1958 December[25] wrote that Jones's annual average output was then at 10,000, therefore it is reasonable to assume that he made about **50,000** observations in the years 1958–1962.
- **365,000** observations are in the AAVSO database for the period 1963–2011.

The reason for the shortfall between the estimated total and that in the AAVSO database in 2014 (464,000); is that some of his pre-1963 observations were lost. Initially and throughout most of his observing career he reported his observations to the VSS RASNZ, and many were of stars with preliminary lettered sequences only. The intention with these was to store the light estimates until accurate magnitudes for the comparison stars became available and only then would it be possible to reduce the observations to the standard magnitude scale. Unfortunately a number of these light estimates were lost in the VSS RASNZ headquarters and others are not yet re-reduced (Jones was working on sorting and inputting them just prior to his death, see Figure 19).[26] In addition, it would appear that some of the earlier observations were disposed of when he went through a difficult divorce from his first wife Ann.

It is hoped that some of these lost observations may be recovered in the future by examination of Jones's original observing log books that have been removed from his home, and are now believed to be stored in the Alexander Turnbull Library in Wellington.[27]

So Jones's observing career from a variable star perspective spanned 68 years and 225 days between 1943 and 2011 and from the age of 22 to 91. He averaged throughout this entire period 20 observations daily, 600 observations monthly and 7,500 observations annually.

Discovery of Supernova 1987A

SN1987A (see cover image) reached a peak visual magnitude of 2.9 and is therefore the extra-galactic supernova of brightest apparent magnitude yet seen, and is the only naked-eye supernova seen since 1604. It was co-discovered on 1987 February 24 just a few hours apart by Ian Shelton & Oscar Duhalde at Las Campanas Observatory in Chile and independently by Jones in Nelson, New Zealand.[28]

Figure 19. Jones inputting his observations in his study in 2009 December. *Photo supplied by Ashley Marles from Carolyn Jones' private collection.*

It was late summertime in New Zealand and during the light evening of February 24 Jones attended a committee meeting of the Nelson Tramping Club. He did not stay for the socialising afterwards because the sky was clear and it was getting dark, so he went home and started his observing routine. He had three stars on his observing programme that were close to the Tarantula Nebula (NGC 2020) in the LMC but as is customary he started to look at the stars in the western sky first. Some cloud then started to move across the sky so he switched to the three targets in the LMC and immediately noticed a bright new blue star. He double checked the intruder's position with respect to the three target stars and the Tarantula and marked it on his chart.

Since the object was stationary within the LMC and unlikely to be an asteroid (too bright at approximately magnitude 6 and not in the vicinity of the ecliptic), it dawned on Jones that this could be a supernova. Then before he could make an accurate magnitude estimate the cloud covered up the LMC. Jones phoned Frank Bateson who in turn started to phone others in an attempt to get confirmation. Meanwhile the sky started to clear again at Nelson and Jones secured a magnitude estimate of 5.1mv. Jones rang Bateson again who in turn contacted Siding Spring Observatory in Australia where everyone stopped what they were doing and focused their attention on what appeared to be an incredibly bright supernova on the rise. Among the staff at Siding Spring was Robert McNaught, who checked the photographs he took the previous night and found the supernova recorded at approximately magnitude 6.0.

McNaught then phoned Brian Marsden at the Central Bureau for Astronomical Telegrams who was already on the phone to Las Campanas Observatory, so he left a message with the secretary. Marsden phoned McNaught back to offer congratulations but McNaught said he was not responsible for the discovery; it was made by someone in New Zealand. Although details were still to emerge Marsden had already guessed that Jones might be the discoverer. Jones continued to observe the supernova and other variables that night to 1 a.m. He then had a short nap before resuming observing until dawn.

SN1987A was the first nearby supernova that could be examined by modern scientific instruments and was a major event for southern hemisphere astronomers and scientists world-wide. Within hours of the discovery announcement, major ground-based observatories and space-borne satellites directed their primary instruments onto the supernova. In addition to visible light, particle emission (neutrinos) was detected from it. SN1987A continued to brighten to approximately magnitude 2.9 three months after discovery before beginning to fade, and was still at mag 6 at the end of 1987.

The publicity generated by this event was a major boost to southern hemisphere amateur astronomy because many members of the general public were attracted to local observatories to view the supernova. On account of its relatively close proximity (168,000 light years) SN1987A has become by far the best studied supernova of all time.

Comet work and the BAA

In addition to variable stars and the aurora, Jones also observed meteors and comets. In 1945 he joined the BAA and NZAS Comet Sections, and the Director of the NZAS Comet Section Douglas C. Berry allocated him a section of the sky for comet sweeping. Almost immediately in 1945 June Jones made an independent recovery of P/Kopff.

The following year on August 7 (two days before his 26th birthday) with his 5.3-inch refractor he discovered a ninth magnitude comet close to U Puppis that became designated as Comet 1946h, then Comet 1946 VI and finally C/1946 P1. The discovery of Comet 1946h was described by Jones in a letter to BAA Comet Section Director Gerald Merton as follows:

'I had been up that morning [August 7 N.Z. date] observing variable stars, then swept for comets in the area south of 40 degrees that Berry allotted to me. About 06 hours N.Z.S.T. I ceased sweeping and commenced to observe a few variable stars low in the east, which had been too low to observe earlier. At approximately 06.15 hours [Aug. 6d 18h 15m G.M.T.] I decided to observe U Puppis next and, as dawn had arrived, I did not waste time getting the box to stand on to reach the finder but sighted roughly along the telescope. But my aim was out and realizing that it was too high I swept downwards, but did not get as far as U Puppis for I came across an object that I felt sure was a stranger. Quickly I made a field drawing and plotted the position on H. B. Webb's Atlas.

Then I purposely refrained from examining the object until about 20 minutes later on when, deciding that to wait longer would be to lose it in the rapidly brightening sky, I again observed it but could not be sure whether it had moved in the interval or not. Before leaving for work I again examined the N.G..C. but could not find an object of that description there. It seemed too good to be true that

Figure 20. Jones with Heather Couper (BAA President 1984–1986) and Peter Knowles on 1995 July 30. *Photo supplied by Ashley Marles from Carolyn Jones' private collection.*

it was a comet. I felt certain I had made no mistake in its position, that being near U Puppis I should have found it before when looking for that field, and that when looking through the N.G..C. I had not missed anything. But, as I had not observed motion and did not want to raise a false alarm, I decided to wait until next morning.

The next morning I was up early again, intending to observe variables until the comet (?) rose high enough for observation but before I had made a single observation the sky clouded over. Then I really wished I had reported the object for it seemed that my chance of seeing it that morning had gone, and perhaps others might have been more fortunate. I waited up and later was gratified to see the sky begin to clear. Shortly after 06.00 hours I had a chance to look up the previous day's position but the comet was not to be seen. A quick sweep soon located it not far away, and another field drawing was made, and the field plotted on Webb's Atlas.

Figure 21. Jones with Sir Patrick Moore (BAA President 1982–1984) on 1997 October 19. *Photo supplied by Ashley Marles from Carolyn Jones' private collection.*

The comet appeared diffuse, with central condensation, but no tail was detected. I estimated its magnitude as 9 by comparing it with comparison stars of the U Puppis field, by putting the stars out of focus as recommended by Dr. Steavenson in the *Journal* (**52**, 191). That confirmed my guess of magnitude 9 on the morning of discovery. The diameter of the coma was not estimated at the time but a rough estimate from the field drawings would make it about 1 minute of arc – but of course that result is very unreliable. During September I fancied that I could trace a faint tail'.[29]

Jones continued to follow the comet until October 9 after which it became too near the Sun for observation. Jones's magnitude estimates with the 5.3-inch refractor (magnification ×42) indicated the comet had brightened to magnitude 7.0 by October 3.[30]

The discovery of this comet led to Jones's being awarded the Donohoe Comet Medal by the Astronomical Society of the Pacific in 1947. In 1952 Jones independently recovered periodic comet Grigg–Skjellerup. Then nearly 50 years later in 2000 Jones discovered his second comet, which happened to lie just 50 arcminutes NW of the variable star T Aps, and was detected in the 78mm (×30) refractor finder-scope of 'Lesbet'. Jones described the discovery as follows:

'On the morning of November 26, I was up early (as I do on clear mornings) observing variable stars before dawn, then as I was pointing the telescope to view a faint variable star south of the Southern Cross and Pointers, I noticed a fuzzy object that was new to the region, and recognising that it was a comet and not permanent celestial scenery like a nebula, star cluster or galaxy, I noted its position and other details. Then I phoned Alan Gilmore at the Mount John University Observatory (by Lake Tekapo) and told him about it and asked if he knew about it and its name, but he had no information about it so he e-mailed a message to the International Central Bureau for Astronomical Telegrams (CBAT) at Cambridge, Mass. USA.

At breakfast that morning Carolyn wondered why I did not get back to bed before bright daylight – I replied that I had been on the phone to Alan about a comet asking whether it was a known one. After breakfast a message came from the CBAT saying that it might be the same object that a Japanese comet hunter had seen a week beforehand, but which had not been seen again because it was moving south so fast and was thus unconfirmed. Using the Japanese positions for the comet and mine, they determined that it was the same object, to be known as Comet 2000 W1 Utsunomiya–Jones. It has quickly moved towards the west and is moving north again. December 5 was the last evening that I saw it, as it was too low in the sky and behind trees the next night. Next January when the comet's motion brings it into the eastern sky before dawn, it will be much fainter as it races away to the outer reaches of the Solar System.

Over 50 years ago, I spent some time looking for unknown comets, and now I find one while pointing the telescope to a variable star! The moral of the story is to keep looking and you never know what you might see. You just need to be lucky enough to look at the right place at the right time! By the way, I am told that I am the oldest person to have discovered a comet'.[31]

At the age of 80 Jones had indeed become the oldest person to discover a comet. The next nearest was Lewis Swift who was 79 when he found his last comet in 1899. Jones also holds the record for the longest interval (54 years) between successive comet discoveries. When BAA Comet Section Director Jonathan Shanklin e-mailed Jones to offer congratulations on his second comet discovery, Jones's response included the remark 'communications have come a long way since my first discovery'.[32]

Jones has over 1000 observations in the digital archive of the BAA Comet Section, made through the years 1951 to 2008. He served as Assistant Director of the Section from 1952 to 1990, and the BAA awarded Jones the Merlin Medal and Gift in 1968 specifically for consistently establishing accurate comet magnitudes. Jones was a member of the BAA for over 68 years, was very well respected and several senior BAA figures made a point of meeting him (Figures 20 & 21) when visiting the Australasian region.

Medals, awards and tributes

Albert Jones was made an Officer of the Order of the British Empire (OBE) on 1987 June 13 for services to astronomy and is the only person to have received such an award for predominantly visual photometry of variable stars. The following year asteroid **(3152) Jones** was named after him by its discoverers Alan Gilmore and Pamela Kilmartin at Mt John Observatory. In 2004 Jones received an Honorary Doctorate of Science from Victoria University in Wellington (Figure 22).

Jones is one of the most decorated people in the history of observational astronomy. His awards include:

1945 Murray Geddes Memorial Prize from the NZAS
1947 Donohoe Comet Medal from the Astronomical Society of the Pacific (ASP)
1949 Donovan Medal & Prize from the Donovan Astronomical Trust (NSW)
1956 Michaelis Gold Medal & Prize from the University of Otago

1960 Jackson Gwilt Medal & Gift (jointly with Frank Bateson) from the RAS
1968 Merlin Medal & Gift from the BAA
1973 Bronze Comet Medal from the ASP
1997 Director's Award from the AAVSO
1998 Edward A. Halbach Amateur Achievement Award from the ASP
1998 Steavenson Memorial Award from the BAA
2001 Edgar Wilson Award from the Smithsonian Astrophysical Observatory (SAO)
2005 Murray Geddes Prize (jointly with Carolyn Jones) from the RASNZ
2008 Merit Award from the AAVSO

Frank Bateson, the Director of the VSS RASNZ paid the following tribute to Jones in 1959:

'I would like to record the magnificent contribution that has been made to our Section's work by Albert Jones of Timaru. The skill and accuracy of his observations are matched only by their persistency and numbers'.[33] At the Centenary Meeting of the BAA VSS in 1991, professional astronomer Albert Zijlstra paid tribute to Jones just prior to presenting a paper on R Dor that was based solely on Jones's visual data.

At their Centenary Meeting in 2011 Jones was made an honorary life member of the AAVSO.

The final years

Jones did everything conceivable to extend his observing career. He was fully active up to 2008 when at the age of 88 he suffered a stroke, then in a reduced capacity until May 2010 (three months short of his 90th birthday) when a fall during an observing session resulted in a fractured hip. Following this accident he observed in a very limited capacity for a further year with the aid of a customised walking frame. He described observing in 2011 with the 12.5-inch Dobsonian (Figure 23) as follows:

'The new telescope is so much easier to handle but due to my disabilities, I am afraid that work is much slower than before. Not only because of the repaired hip and the stroke before that, but as my right eye has macular degeneration, I have to use my left eye and that makes it harder to view through the finder. If I twist my body and turn my head, I feel wobbly and am scared of falling again, so I take the walking frame with me, lock on the brakes and hang onto the handle for stability'.[34]

Figure 23. Jones demonstrating using the 12.5-inch Dobsonian with the aid of a walking frame in 2011 April. *Photo supplied by Albert Jones.*

He kept in contact with many other visual observers around the world and encouraged them to maintain their work on variable stars. In the case of some blue stars that he could no longer follow due to his frailties, he enlisted Rod Stubbings in Australia to continue the monitoring. While not interested in his own observational statistics, Jones was very quick to congratulate other visual observers when they achieved observing milestones.[35]

Jones' humour came through on much of his correspondence and in his later years the author received the following e-mail comments:

– '*Sorry for the delay, I am recovering from another fall and broken collar bone – Tad C Nile*'

– '*My proper motion is rather slow and I have to be careful not to fall over again – Gerry Attrick*'

Two of Jones' better known quotations are as follows:

– '*Being a mere amateur has the advantage that I can observe what I want to observe and whenever I wish*'

– '*One does not have to be crazy to be an amateur astronomer, but it helps*'

and finally here is a quote from Carolyn:

– '*Yes, he has only found one supernova, but it was a GOOD one*'

Albert Jones passed away peacefully at the age of 93 in Nelson, New Zealand on 2013 September 11. The funeral was held on September 16 and was marked by observers in Europe undertaking simultaneous visual observations of V339 (Nova) Del in his honour. He is survived by his

Figure 22. Jones receiving his Honorary Doctorate from the Chancellor of the Victoria University of Wellington, Dr Rosemary Barrington, on 2004 May 7. *Photo supplied by Bruce Leadley.*

wife Carolyn and is profoundly respected by the professional and amateur astronomical community for his pioneering work and industrious dedication to observing variable stars.

Legacy

Since the middle of the 18th century in excess of 10,000 individuals have undertaken visual photometry of variable stars. During that time 20 million observations have been accumulated, of which 1 in 40 was made by Albert Jones.

The wide diversity of variable stars means there are many types of star available to the observer and each observer is at liberty to work out what best interests and suits them. It was pointed out by Markwick in 1904 that a 'good series of determinations of a single variable is worth far more than a large number of scattered sporadic observations of many stars'[36] and today it is acknowledged that the most scientifically useful visual observations are those produced by systematic observers. What Jones achieved in this respect was to systematically observe a large number of variables of different types over a period of 68 years, which is truly the pinnacle of visual photometry.

Much of what is known about the longterm behaviour of southern variable stars is owed to the systematic visual monitoring undertaken by Jones. If a far south variable star has a well-defined lightcurve prior to 2008 then it is almost guaranteed that it would be on Jones's observing programme. He was an outstanding example of a self-taught professional amateur astronomer who developed his skills and applied them on the rich and largely virgin southern hemisphere skies. He constructed his own instruments and finely optimised and applied the visual variable star observing techniques that had been initially developed by the likes of Herschel, Goodricke and Argelander.

Albert Jones was the first person to systematically mass produce variable star observations on an industrial scale for a sustained period. Other prolific observers such as Hiroaki Narumi, Taichi Kato, Dani Overbeek, Gary Poyner and Rod Stubbings would follow, but they have not been able to sustain equivalent output over such an extended time. With the advent of electronic CCDs that facilitate large numbers of accurate photometric measurements of variables with minimal effort, the visual work of Jones is unlikely to be repeated and could well remain unsurpassed. What is certain is that Albert Jones's observations of variable stars will remain a permanent and most valuable asset to the scientific community.

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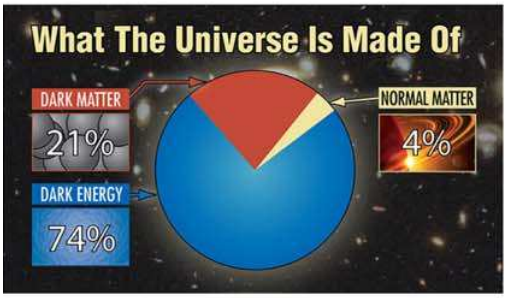

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