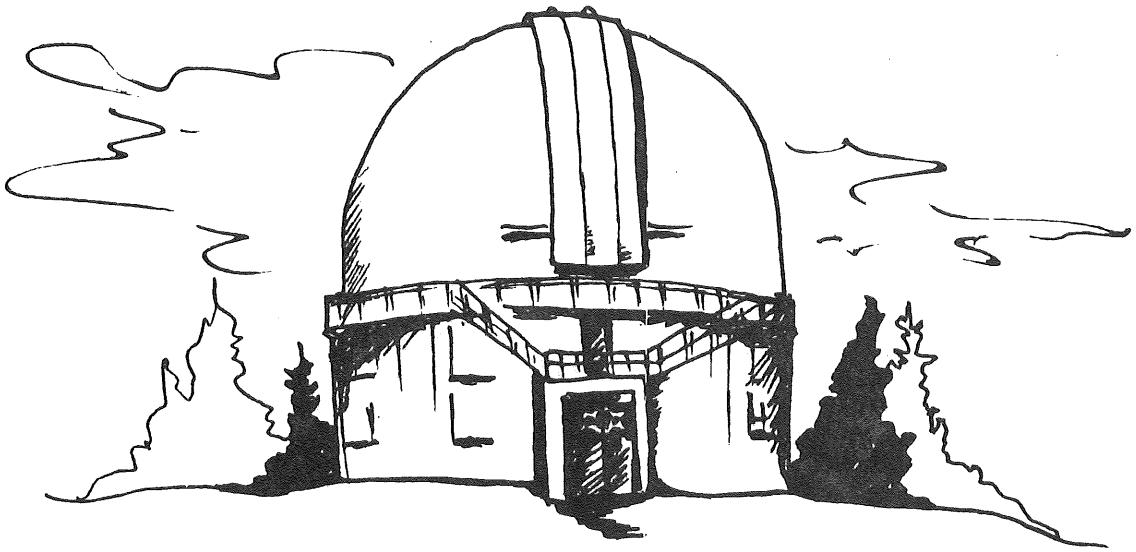

DAVID DUNLAP DOINGS

VOL. 9, NO. 2 FEB. 24, 1976

THE TIME OF RELAXATION OF STELLAR SYSTEMS. II
RALPH E. WILLIAMSON AND S. CHANDRASEKHAR

THE CONTINUOUS SPECTRUM OF MODEL STELLAR ATMOSPHERES
RALPH E. WILLIAMSON

THE NEGATIVE HYDROGEN ION AND ITS ABSORPTION COEFFICIENT
RALPH E. WILLIAMSON

CONCERNING THE SOURCE OF GALACTIC RADIO NOISE
BY RALPH E. WILLIAMSON

GALACTIC NOISE AND THE PLANE OF THE GALAXY
By RUTH J. NORTHCOTT and RALPH E. WILLIAMSON

THE ATMOSPHERE OF THE SUN*
BY RALPH E. WILLIAMSON

THE PRESENT STATUS OF MICROWAVE ASTRONOMY*
BY RALPH E. WILLIAMSON

R. E. Williamson

(see p. 2)

EDITORIAL

The Early Post-war Years

2. *Ralph Williamson*

In last month's Editorial I wrote of the appointment of Dr. C.S. Yu in 1946 (actually he arrived here early in 1947). During 1946 Frank Hogg was negotiating for another appointment to the teaching staff.

One of the applicants was Ralph E. Williamson, an Oklahoman by birth, A.B. (Phillips 1938), A.M. (Drake 1939) and Ph.D. (Chicago 1943). In 1946 he was completing a second year as lecturer in astronomy at Cornell. Williamson's research training under Chandrasekhar in the field of stellar structure seemed made to order for our requirements. We lacked anyone on our staff who claimed proficiency in any theoretical field, much less in the new and important developments in stellar structure and evolution. Frank was delighted to be able to come to an agreement with Ralph, and he arrived in September of 1946. Although he was with us for only seven years that was long enough to establish a chain of theoretical astrophysicists which included Bev Oke, Leonard Searle and Pierre Demarque, and to give us a role in the field of stellar structure of which we could be justly proud.

Bev Oke was a physics graduate of U. of T., 1949 who became one of Ralph's first graduate students. His Master's thesis in 1950, entitled "A Theoretical HR Diagram for Red Dwarf Stars", included the first demonstration that it is the proton-proton reaction that dominates energy production in the sun's interior. On the strength of this good piece of work Bev became our first student to be accepted for a Ph.D. program at Princeton. When Bev finished there in 1953, the year that Williamson left us, we offered him a job in the Department, which he accepted. Three years later another theoretical astrophysicist, Leonard Searle, who had just received his Ph.D. from Princeton joined us. He and Bev Oke made a good team in both theoretical and observational astrophysics. When Pierre Demarque, a B.Sc. from McGill, enrolled in a graduate astronomy program here Bev and Len both taught him, and Len supervised his 1959 thesis on "The Structure of Subdwarf Stars". Pierre found a job at Louisiana State, but by 1962 when Searle and Oke had been pirated from us by Cal Tech, he returned to us and held the stellar-structure fort until he in turn was tempted away (to Chicago) in 1966. (It seems hard to believe now, but the early 60's had been a terribly hard time to obtain and hold staff, what with the post-sputnik demand for astronomers and the famous brain-drain to the U.S.).

With Demarque's departure in 1966 our Williamson stellar-structure "strain" had run out. To mix metaphors, we had to return to the well-head of

Chandrasekhar again, this time to hire a promising young Canadian named Maurice Clement.

To return to the Williamson story, Ralph, in addition to his stellar structure interest, was one of the few young astronomers who, in the '40's, began to recognize the importance of the not-yet-quite-respectable subject of radio astronomy. He had a way of infecting others with his enthusiasm. Ruth Northcott, usually timid and un-self-confident about anything new, cheerfully teamed up with Ralph in a paper on the galactic radio equator. Ralph, no great observer himself, persuaded me to help him try to identify optically the strong radio source Cas A. On a terribly windy November night in 1951 we actually photographed Cas A with the 74-inch, anticipating Baade by some months. Unfortunately the quality of our image did not permit us to distinguish it from a plate smudge.

Don MacRae, then at the Warner and Swasey Observatory, and beginning also to flirt with radio astronomy, paid us many visits for long conferences with Ralph. As it turned out, Don was appointed as Ralph's replacement in 1953, and one of his first projects here was to involve our Department in an observational radio astronomy program with the Department of Electrical Engineering.

Ralph's departure in 1953 stemmed partly from personal circumstances at the time and partly from a tempting offer in the very different field of the physics and design of weapons at the Los Alamos Scientific Laboratory. I believe he waged quite a battle with his conscience, prompted on the one hand by feelings of patriotism (he had retained his American Citizenship) and on the other by a natural revulsion against war. However, he took the job, and apparently he abandoned astronomy immediately and completely. So far as I know he never attended another astronomy meeting or wrote another paper in the subject.

J. F. H.

OBSERVING

Las Campanas

Operations are running very smoothly these days. The telescope is "working beautifully", according to our resident observer Gerry Grieve. The winter and spring schedule (or summer and fall, depending upon your point of view) is full with good projects. The pity is that we don't have a bigger telescope down there - a two-metre would do fine just now.

R.F.G.

NASA

Bob McLaren is at the NASA Ames Research Center near San Francisco from Feb. 12 till March 1. He is collaborating with the Townes group from Berkeley in obtaining some far-infrared spectroscopic observations using the one-metre telescope in NASA's C-141 aircraft.

Radio Astronomy

Ernie Seaquist was in Charlottesville Feb. 11-20 reducing radio astronomy data.

COMINGS AND GOINGS

Don MacRae was in Williamsburg Virginia on January 25 to 29 to attend an International Conference on Space Observatories. The host was the Space Science Board of the NRC-National Academy of Sciences of Washington, D.C. The European Science Foundation was a co-sponsor of the conference. In attendance were about two dozen scientists from both sides of the Atlantic. The principal discussion ranged around the Large Space Telescope, its scientific usefulness, and how it would best be operated to the benefit of scientists internationally. At its conclusion the conferees left with a strong feeling of optimism for this project and for its initiation in the near future. Don is in Ottawa and Montreal during the week of February 23 to 27 attending meetings of the Board of Trustees of the Canada-France-Hawaii telescope corporation. The Board will be particularly concerned with the operational phase of the corporation when the telescope begins to be used in Hawaii.

John Percy gave a seminar on Jan. 16 at the University of Western Ontario on "The Problem of the Beta Cephei Stars".

Bob Garrison was at the University of Maryland in January serving as external examiner at the Ph.D. thesis defence of Peter Jackson (M.Sc. U. of T. 1968). Peter has already begun a PDF at the University of Waterloo and at the moment is observing with our telescope at Las Campanas.

René Racine was at St. Mary's University, Halifax, early in February and then attended a meeting of the Grants Committee of NRC.

Philipp Kronberg was back in Canada for the NRC Grants Committee meetings for about a week in early February. He has now returned to Bonn.

SEMINARS

FEBRUARY

As announced, with the addition of Dr. Alan Batten, D.A.O., "Recent Work on Beta Lyrae" on February 4.

MARCH

Tues. 2nd D.D.O. 4 p.m.	P. Martin, "The Origin of the Optical Polarization in NGC 1068"
Tues. 9th D.D.O. 4 p.m	R. Garrison, "Galactic Structure from the Southern Hemisphere"
Tues. 16th D.D.O. 4 p.m.	T. Bolton, "The Algol Problem(s)"
Thurs. 18th McL. 102, 4 p.m.	E. Purcell, Harvard University - to be announced (Joint Colloquium with Physics Department)
Tues. 23rd D.D.O. 4 p.m.	A. Toomre, Massachusetts Institute of Technology, "Ring Galaxies and Round Galaxies"
Tues. 30th D.D.O. 4 p.m.	M. P. FitzGerald, University of Waterloo and C. R. Purton, York University, - "V1016 Cygni - A Proto-Planetary Nebula"

PAPERS SUBMITTED IN FEBRUARY

J.R.P. Angel, H.S. Stockman, N.J. Woolf, E.A. Beaver, & P.G. Martin	"The Origin of Optical Polarization in NGC 1068".
B. Campbell	"H Alpha Variations in Nova Cygni 1975".
C.T. Bolton & W. Herbst	"Photometry of Stars Near 3U1700-37 = HD153919 & 3U0900-40 = HD77581".
C.C. Dyer & R.C. Roeder	"Clusters of Galaxies as Gravitational Lenses".
S. van den Bergh	"UBV Observations of Nova Scuti 1975".
	"A New Classification System for Galaxies".
S. van den Bergh, G.L.H. Harris, E. Herbst & W. Herbst	"The Cepheid SV Crucis and the Cluster Ruprecht 97".
K. Kamper & S. van den Bergh	"Cassiopeia A; The Unseen Companion".
D.G. Turner	"The Value of R in Monoceros".
(for Feb. issue of A.J.)	"Importance of Random Scatter to Variable-Extinction Analyses".

W. Herbst & D.G. Turner — "Lynds 810 - An Interesting Globule in Northern Vulpecula".

J. Heard, R. Hurkens, J. Percy & M. Porco — "Studies of 12 (DD) Lacertae".

LETTER TO THE EDITOR

Sir:

I was very interested to read of C.S. Yu's sojourn in Toronto during 1946. I too have had occasion to meet him, but much later. When I told Dr. Wildt at Yale of my plan to teach at a small college in Pennsylvania, he mentioned that there was another astronomer not far away - in Frederick, Maryland. On discovery that this astronomer was none other than C.S. Yu, who in 1922 had studied the eclipsing variable star CG Cygni for his master's thesis at Allegheny Observatory, I made it a priority item of business to visit him early in 1967 at Hood College, where he was still teaching. On that occasion we were, perhaps, the only living astronomers who had ever studied this star at that stage, so we managed to hold a two-man colloquium, first at the observatory and later at his home which, from his (self taught) civil engineering days, he had been able to build himself. I think this system has proven itself worthy of our attentions!

I hope that we are not embarrassing him by saying so, but from my short visit with him I agree completely that he is a man of considerable kindness and sensitivity.

Dr. E.F. Milone
Associate Professor
University of Calgary

POTPOURRI

DAVE BLYTH'S FAMILY BEREAVED

Mr. George McKinley, father of Margaret Blyth, died suddenly in Edinburgh on January 28. Margaret and daughter Cornelia flew to Scotland for the funeral. Cornelia has remained, visiting friends in Inverness.

SvB Honoured

Sidney van den Bergh has been chosen 1976 McMillan Lecturer at Ohio State University.

Department Busy Feb. 5-10

On Thursday (Feb. 5) afternoon there was a meeting of the Astronomy Discipline Group under the aegis of ACAP. It is required to meet from time to time to discuss the progress of Astronomy as a graduate discipline in the province. Representatives were present from Queen's, York, Western and Toronto with Bill Wehlau as Chairman. On Friday, February 6 the Associate Committee for Astronomy of the NRC with Don MacRae as Chairman met all day with essentially a full complement of members from all across Canada. As usual the Associate Committee resolved itself into the National Committee for Canada of the IAU towards the end of the afternoon. On Saturday there was a meeting of the Council of the CAS in the Department, and on Monday and Tuesday the Scientific Advisory Committee of the Canada-France-Hawaii telescope met with the Department as host and Esther Salve as a local arrangement committee of one.

Connaught Fellows Meet

Dave Turner attended an informal debate and reception held at Massey College January 29 to honour holders of Connaught Scholarships and Fellowships. A panel consisting of Profs. J. Leyerle (Humanities), C.B. MacPherson (Social Science), J. Polanyi (Natural Sciences) and L. Siminovitch (Medicine) debated the topic "The Relevance of University Research".

More About Mrs. Nolan Walborn

Nolan has written to say that his bride's name was Gladys de las Nieves Olivares Villaseca and that she was formerly a member of the Cerra Tololo accounting staff.

Interstellar Medium Group

A small group within the Department proposes to meet from time to time to discuss common interests in the interstellar medium. So far they are Bill Clarke, Peter Martin, Bob McLaren, Martine Normandin, Ernie Seaquist. They invite any others within the University who are interested to write to Prof. Peter Martin.

HSH AT RCI

Helen Hogg addressed the Royal Canadian Institute on "Astronomy in Canada - Then and Now" on February 14.

BORN

To Bob and (former Librarian) Sheila Smolkin a son, Steven Michael on January 16.

NEWS FROM CANTAB

Barry Madore (Ph.D. 1974) writes that he and Kathy are busy in Cambridge re-building an old house (that's what he says!).

FINAL ITEM

That Dude Hailey

About a million years ago - well, 1958 to be exact - when I had just acquired my shiny new Ph.D., I discovered, too late, what it is like to teach an elementary astronomy course. I whiled away most of the glories of that Indiana summer hacking away at a class of summer students, the great majority of whom I have long since forgotten. All but one. I'm sorry I can't recollect his name, but he was black, was instantly recognizable as a New Yorker from his accent, and was one of the most intelligent and quick-witted students I've ever taught.

It wasn't so much that he was irrepressible in his remarks, as that he had the most appalling knack of taking the wind out of one's sails at the least expected moment. I remember when we had finished with the solar system I decided to try and impress the students with the vast leap from there to the dimensions of the sidereal universe. I said that if we were to bring the sun down to the size of a six-inch ball, then the planets would be all on the campus, but where did they think the nearest star would be? I gave them a few moments to hazard a tentative guess or two at maybe the city limits or even the next county before I triumphantly zapped them with the fact that the nearest star would be in Europe. From out of the sea of stony faces before me came this guy without a moment's hesitation: "Why, man, I guess it'd be in Europe!" . The so-and-so.

I remember him also interrupting my authoritative lecture on meteors to ask about tektites, something that at the time I knew absolutely zilch about, my own professors having somehow neglected to mention this vital topic. But what I always recall first about this fellow was an occasion when he was doing the talking. The class being fairly small I had assigned each student to give a short talk on

some astronomical topic that interested him or her. My friend elected to deal with comets, and started off with a two-sentence historical review of Halley's Comet: "In England there was this guy Hailey--". I threw up a hand in horror and admonished him that the man's name was Halley, not Hailey; you rhymed it with 'alley'! He suffered my interruption with indifference, and immediately continued: "Yeah - well, like I was saying, there was this dude Hailey..."

Looking back from almost twenty years down the road I can only laugh at my own naiveté. Fancy trying to convince anyone to pronounce Halley's name as it is spelled; one might as well try converting the Pope to atheism. For I have long since learnt that if there is only one astronomical fact known to the man on the street (and several off the street, for that matter), it will be the unalterable conviction that Edmond Halley's name is pronounced 'Hailey'.

So, comfortable in my superiority on this fact, there I was at Greenwich last summer, attending a historical jamboree, when up popped Colin Ronan and gave us all a rude shock. It seems that Edmond himself did not syllabify his name as Hal-ley, but as Hall-ey. In other words, he pronounced his name as Hawley or, if I may further distinguish between British and Najun pronounciation, as Horley. This has come to light through several recently found letters to Halley from a number of people who actually addressed him as Mr. Hawley. Poor old Ed must have been spinning in his grave all these many years.

There was one historian from Oxford at the conference who found this revelation quite upsetting. He happened to be an authority on James Bradley, and wondered if he would now have to start talking about James Broadley.

Halley, pronounce him how you will, was an interesting man, even for a savant of his era. (He lived 1656-1743.) This is no place to go into all the details of his life, but let me remind you of how wide were his interests.

In a sense, Halley was that common phenomenon, the rich man's son who drops out of university but is operator enough to get what he wants. What happened was that while he was still an undergraduate at Oxford he set off for the island of St. Helena to study the southern stars, and stayed away so long (two years) that his residence requirements at Oxford were not met and the authorities refused him his degree. One of the things Halley had been doing down there was naming constellations, and in a moment of inspiration he named one of them after the King (actually Charles' famous oak tree). The King thought that pretty decent of Halley, and to reciprocate promptly passed a special decree awarding him an Oxford MA.

Halley, of course, was one of that astonishing coterie of Englishmen, Isaac Newton, John Flamsteed, Robert Hooke, Christopher Wren, Robert Boyle, and others, who spent all their time squabbling bitterly among themselves while doing more for science than any other such group in history. At one stage Hooke was having a terrible set-to with Hevelius over the question of whether telescopic sights improved one's ability to measure small angles. Halley was sent over to convince Hevelius of the error of his ways, and succeeded in one night where Hooke had failed in many months: "Hevelius received him with great Joy and respect; and they Fell to Observing the same Evening...."

"Mr. Halley the following year 1682 changed his Condition, marrying Mrs. Mary Tooke, an agreeable young Gentlewoman... she was his only wife, and with whom he lived very happyly, and in great agreement, upwards of 55 years...." They had two girls and a boy.

After a spell as deputy controller of the Royal Mint, Halley became the only astronomer ever to wangle the captaincy of a Royal Navy ship, and spent a couple of years wandering around the Atlantic on the Paramour Pink doing geomagnetism. This time diplomacy failed him, and in Barbados he found himself faced with a small mutiny led by the first mate. You should have heard what the Admiralty said the next time they were asked to let an astronomer captain one of their ships. They insisted on one of their own men, a guy named James Cook.

Halley the astronomer we are accustomed to. There was his being the originator of what today is called Olbers' Paradox, his showing the importance of the transits of Venus, his discovery of proper motions, his method for finding the age of the earth, and -let's not forget- the famous comet. Plus a whole lot more.

But there was also Halley the inventor and user of a commercial diving bell, Halley the archeologist (his work on Palmyra excited others in the field for a hundred years), Halley the spy (on French seaports), Halley the translator, and Halley the shipbuilding expert hob-nobbing with Peter the Great of Russia in the coffee-houses of Deptford.

He began his career as Astronomer Royal at the age of 64, whereupon he embarked on an eighteen-year program of lunar observations. This he completed himself, and was still deriving important results from it when he died at 86.

Yes, Flamsteed may have called him a drunken sea-captain, but old Halley, Hailey, Hawley was quite a dude.

J.D.F.