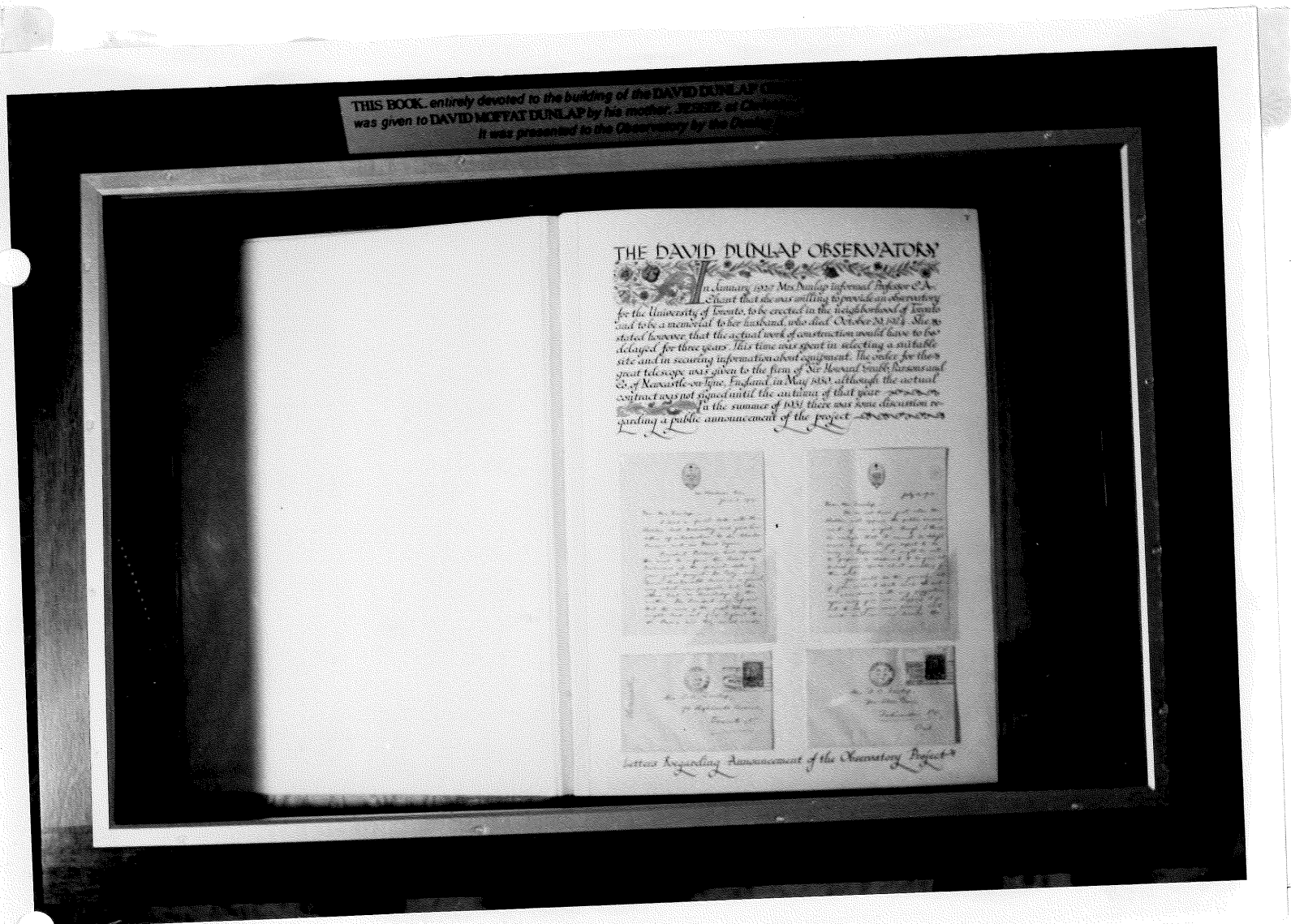


THE ^{DAVID} DUNLAP DOINGS

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Mrs. Dunlap's Great Book

Photo: Karl Kamper (See p.3)

CONGRATULATIONS

To *Maurice Clement* on his promotion to Full Professor effective July 1, 1981.

To *Dorothy Fraquelli*, who successfully defended her thesis "A Spectroscopic Survey of Some Bright RS CVn Binaries" (abstract on p. 9) on March 20. *Bernie Bopp* of the University of Toledo was external examiner. Dorothy is currently a Research Associate at Dartmouth College in Hanover, N.H.

To *Christine* and *Maurice Clement* on the birth of their first child, *David Young Clement*, born on Friday March 20. Young David's evolution at the end of one month is highly satisfactory, Maurice reports. Christine will be resuming her work in the department on a half-time basis at the end of maternity leave.

To *Dennis Crabtree*, *Lindsey Davis*, *Chris McAlary*, and *Chris Rogers*, all of whom have been awarded NSERC Postdoctoral Fellowships.

To *Helen Hogg*, who is to receive an honorary Doctor of Letters and deliver the convocation address at St. Mary's University on Monday May 11.

THE BOOK OF GENESIS

In the beginning it was a gleam in Clarence Augustus Chant's eye: an observatory for the burgeoning city of Toronto. His civic pride and a certain dogged determination kept it aglow. Over a period of several years before his death on October 29, 1924 David Alexander Dunlap had developed an interest in astronomy and was often present at meetings of the R.A.S.C. in which, of course, Chant took a major part. In Chant's words, "Astronomy and geology were both favourite studies of Mr. Dunlap, but the former had a peculiar attraction for him. He was a keen student of the heavens and always liked to share his knowledge with others". Jessie Donalda Dunlap was responsive to the idea of an observatory as a memorial to her late husband, and so began the close collaboration between Dr. Chant and Mrs. Dunlap which produced the David Dunlap Observatory in 1935.

We have Dr. Chant's memoirs, of course, and two volumes of his pictures which relate particularly to the construction. But recently the Observatory has come into possession of another unique piece of memorabilia - Mrs. Dunlap's own scrap-book about the observatory. In the form of "Letters, Newspaper clippings, Printed articles and Photographs" it contains a wealth of detail about the way the project was undertaken and then carried out over a period of years. Besides being a historical record, the book's contents illuminate in an interesting way the manners and life-styles of a segment of the Toronto community 50 years ago, and reveal the mutual respect which grew up between Dr. Chant and Mrs. Dunlap.

David Moffat Dunlap, (1909-1957, and known as Moffat) was the only son of David Alexander and Jessie Donalda Dunlap. He was associated with his mother in the gift, but among present-day Toronto astronomers he is perhaps best remembered as the handsome young gentleman in striped pants and cutaway coat who was photographed on Sept. 10, 1932 in the act of laying the cornerstone of the Administration Building. Mrs. Dunlap gave her "Great Book" to her son at Christmas, 1934. It passed into the keeping of his young widow, Peggy, now Mrs. J. Harold Crang of Toronto and Newmarket. Mrs. Crang donated the book to the University in 1978 with the suggestion that it be displayed in the foyer of the Observatory. This was about the same time as she gave us the magnificent antique Chinese chest which has done so much to improve the otherwise rather bare appearance of the entrance hall.

The book itself is huge by any standard, 40 cm wide by 50 cm high and 15 cm thick. The covers are of oak and the massive metal hinges are decorated with brass stars and suns. It can be held closed with a heavy metal clasp and lock. It was apparently patterned after another one referred to as "The Massey Book" by Dr. Chant in one of his letters to Mrs. Dunlap.

After more than 40 years some repairs were necessary, and the University Archives, of course, had to make a page-by-page microfilm copy. A few months ago the Great Book came back to us and Don Fernie asked Gerry Longworth to make a suitable display case and stand for it. Book, cabinet and an appropriate legend are now to be seen beside the memorial plaque. Karl Kamper's photograph of the book in its cabinet appears on our cover this month.

Currently the book is open at I:1. "In January 1927 Mrs. Dunlap informed Professor C.A. Chant that she was willing to provide an observatory for the University of Toronto, to be erected in the neighborhood of Toronto and to be a memorial to her husband ..." The work had to be delayed, but not put off, for three years (the property near Richmond Hill was purchased in 1928 "for an undisclosed purpose"). The hand-written letters in the photograph are from Dr. Chant to Mrs. Dunlap in June

and July, 1930, suggesting that the time was ripe for an announcement. It was not until December 30, 1930 however that the plans for the construction of the world's second-largest telescope were made public. The excitement the announcement generated world-wide is well documented.

We are grateful to the Dunlap family for preserving this heirloom so carefully, and for presenting it for display. Whoever comes to the Dunlap Observatory will enjoy it. We who are more intimately involved will particularly value it, the more so as time goes on, as a record of our observatory's beginning.

And our compliments to Gerry Longworth for his care and skill in cabinetry.

MR

THE Be-STAR SYMPOSIUM IN MUNICH

Tom Bolton reports

Tom attended IAU Symposium No. 98 on Be Stars, April 6-10, in Munich, West Germany. The weather was beautiful, the flowers were in bloom, the trees leafed out during the week, and the Bier (Coca Cola?) gardens were operating. Dick Thomas was in his "finest (?)" form and about half the papers were worthwhile.

The meeting had several highlights. The most important was the report of anomalous- or super - excitation lines in the UV spectra of Be stars. High velocity absorption lines of NV, CIV, and SiIV persist to much later spectral types among the Be stars than among normal B-stars. This result generated intense arguments (cf. Dick Thomas above) regarding the nature and location of the source region for the absorption lines. Saul Rappaport gave an interesting review of x-ray emission from Be binaries. Petr Harmanec reviewed the three mechanisms so far suggested for producing Be envelopes (rotational ejection, stellar winds, and binary star mass transfer), and D. Baade and I presented evidence that suggests that pulsation of the central star must also be considered as an envelope ejection mechanism.

Bln

RETURN OF THE NATIVE

Mario Pedreros reports

Being back in the homeland after a long absence of 2.33 yrs. was an uplifting experience for me. Seeing the family, meeting old friends or simply walking the streets of Santiago listening to people speak Spanish with a nice Chilean accent was really exciting.

It seems that Chile was also pleased to see me back as evidenced by the good weather conditions prevailing at Las Campanas Observatory which allowed me to complete (almost) 26 nights of observation in two separate runs.

In the first run, 7 nights were spent at the 100-inch and 4 at the 40-inch telescopes. The former observing program was described by Barry in a previous issue of the Doings, the latter consisted of UBVR direct photographic observations of open clusters. Some of the plates taken with the 40-inch telescope show curious "triangular" star images, but the distortion is not so severe as to prevent the use of the iris photometer. The first of the 4 nights was almost completely lost to clouds.

The second run was spent at the 24-inch U. of T. telescope doing UBVR photometric photometry of open clusters using Photometer #2 equipped with an EMI 9658R photomultiplier. A total of 15 nights were completed. Four hours were lost to clouds in each of the last 2 nights.

The observation of open clusters is part of a program aiming to improve the cluster MS fitting method, determine the binary frequency along the MS, evaluate the universality of the luminosity function, and recalibrate cepheid and supergiant luminosities and intrinsic colours.

During my stay in Chile I had a chance to talk with José Maza who is very busy searching for supernovae. He is carrying out this program using the 70/100-cm Maksutov telescope of the University of Chile. About a thousand galaxies distributed in 50 $5^\circ \times 5^\circ$ fields are being monitored. Each field is photographed at least once a month. So far José and collaborators have reported 11 new SN's. One of these objects was found in the galaxy Fornax A for which a second SN was recently reported (about 3 months after the first one was discovered). This second SN could be clearly seen in some of José's unexplored plates. He missed it because the mentioned plates were intended for photometry of the first object and had not been searched. (Moral: "Explore all of your plates before it is too late").

Pdr

LAS CAMPANAS NEWS

Ian Shelton is the new Resident Astronomer for 1981-82. Ian will graduate (B.Sc. Physics) from the University of Manitoba this spring and has experience in astronomical observing, electronics, optics, and mechanics. He will start his training at DDO June 1 and begin work in Chile in mid-July.

Geoff Clayton and Ian Thompson had an 11-night observing run on the 40-inch telescope at Las Campanas in early March. All 11 nights were clear. Their major project was to measure the wavelength dependence of the polarization of stars in the LMC in order to study the dust in that galaxy. In an interesting secondary project, they monitored the polarization of the x-ray transient A0538-66 as it went through an outburst and found that the polarization showed an increase from 0% to 1.5% coincident with the outburst.

Bob Garrison had a successful (80% of the time useable) observing run on the 24-inch telescope 23 February - 6 March. Bob was obtaining classification spectra for a variety of programmes.

ASTRONOMY GOES ETHNIC

Neb Duric reports

Astronomy is being spread to our ethnic community in southern Ontario, thanks to our Summer Tour Program at DDO.

Last summer, I had the honour of being a Tour Indian (as opposed to a Tour Chief) and in particular, of being a Dome Indian (terminology peculiar to tour organizers). The function of the Dome Indian is to give a short talk on the 74". As it turned out, one evening a woman by the name of Mrs. Francisca Starchev was in the crowd. She was fascinated by astronomy and, as I soon found out, she also runs a daily show on CHIN-FM radio, entitled "Sounds of Yugoslavia" (broadcast of course for the Yugoslav community). After a short chat and a look at my name tag, she suggested I give a few talks on astronomy on her show. The result is that an astronomy talk is currently being broadcast to the Yugoslav community in and around Toronto once a week. I'm finding the experience very interesting, not only because I feel I'm helping to popularize astronomy, but because I'm able to communicate to a group of people who are not fully exposed to English language broadcasts and in particular to science programs.

Developments such as this, I feel, argue favourable for support of the DDO Summer Tour Program. It presents us with a unique opportunity to keep in touch with the people who, after all, are supporting us.

Drc

POTPOURRI

Bob Garrison gave a series of lectures (9 hours) on Stellar Spectroscopy at Laval University March 26-30 and a colloquium on "The Spectral Type of the Sun" on March 30.

Nancy Evans was the colloquium speaker on April 8. Her title was "Binary Cepheids: Recent Results". On March 5, Nancy gave a colloquium on the same topic at Colgate University in Hamilton, N.Y.

Gerry Grieve will be going to Hawaii as one of the recently appointed CFHT Summer Students for a two-month period beginning in mid-June. While there, he will spend part of his time working with a staff astronomer and the remainder on his own research programme. *Donna* plans to join Gerry for at least part of the time.

Earle Luck from Louisiana State University visited the Department on March 24/25 and gave a colloquium entitled "Observational Studies of Chemical Evolution".

CFH KE HEOU

It's a news/nouvelles-letter issued monthly from the CFHT in Kamuela "primarily intended for all of us, CFHT staff members and friends". Sprightly, stimulating and informative, it contains plain, raw news and gossip, and the everyday ups and downs of our hard-working colleagues in Hawaii. Of particular interest to the "friends" among its readership are the sections entitled "Technical Notes" and "Les Missions/The Runs". But "Le Staff" is also a great help in making and maintaining acquaintance with the people out there. The Editors of the Doings are pleased to be on the exchange list; we'll quote excerpts from time to time. Congratulations to the "acting-editor-until-he-can-twist-someone's-arm" Rene Racine for a very nicely done-up house-organ.

From its first issue (January, 1981) we learn that Bruce Campbell's two-year contract has been renewed for a further two-years - good news for all who have seen Bruce in action in Hawaii. The February issue must have been delayed in the mails, but from the March issue we note with great interest that detailed design of the CFHT headquarters is nearly complete. We would also like to quote the following statistics for the 36-day period from Feb. 24 to March 31:

clear sky:	30 nights (83%)
good seeing ($\leq 1''$):	14 nights (39%)
time lost to failures:	equivalent to 4 nights (11%)

Ups and downs, but largely ups.

COLLOQUIA*

- April 20 (Monday) Roland Poeckert, Dominion Astrophysical Observatory
"Detection of Weak Magnetic Fields in Stars"
- April 22 Paul Herget, University of Cincinnati
"Starting the Space Program"
- April 29 Joseph Patterson, Harvard-Smithsonian Center for Astrophysics
"Cannibalism among Degenerates: Will HZ 29A Eat HZ 29B?"
- April 30 (Thursday) Stefan Mochnacki, Dominion Astrophysical Observatory
"Evolution of Contact Binaries"

*Unless otherwise noted, colloquia are held on Wednesdays at 4:00 P.M. in Room MP 134 with TEA at 3:45 in the Reference Room, MP 1404.

PAPERS SUBMITTED

J.R. Percy Photometric Variability of Kappa Cassiopeiae

P.G. Martin Polarization of Scattered Light in Globular Clusters
S.J. Shawl

GASA Election Results

The Graduate Astronomy Students Association (GASA) in accordance with its new "amended" constitution, held the Annual Meeting on Wednesday April 15, 1981. The primary purpose of the Annual Meeting is to elect the new executive for the upcoming year. Here are the results:

	Outgoing	Incoming
President	Donna Zubrod-Grieve Robert Gauthier	Geoff Clayton
Secretary-Treasurer	Robert Gauthier	Rick Crowe
Executive Officer I	Gerry Grieve	Wendy Freedman
Executive Officer II	Wendy Freedman	Leif Schioler
Executive Officer III	Karen Finstad	Neb Duric

As can be seen the executive position of President was shared by two students last year in order to rectify the organizational problems of the association. GASA now has a strong constitution (sic) and an even better financial position. Goodness and wisdom to the new executive!

Gu

THESIS ABSTRACT

"A Spectrophotometric Survey of Some Bright RS CVn Binaries"

Dorothy Fraquelli

Photographic spectrophotometry of the H alpha and Ca II H and K spectral regions is presented for some RS CVn binaries. Equivalent widths were measured for the H alpha line and the Ca II H and K emission cores. A non-standard measuring technique, used to measure the H alpha equivalent widths, is presented. A detailed discussion of the error analysis for the equivalent width measures is given. The equivalent widths and the line profiles were inspected for variations with orbital phase, time and radio flux. Theoretical H alpha absorption line profiles were subtracted from the observed H alpha line profiles in order to study the underlying H alpha emission. The subtracted H alpha emission line profiles were inspected for possible variations with phase and for the presence of multiple components. The full width at the continuum of the subtracted H alpha line profile was measured.

For HD 22468 (=HR 1099 =V711 Tau), the H alpha equivalent widths and line profiles are variable. A correlation exists between H alpha equivalent width and radio flux. The phase dependence exhibited by the equivalent widths is probably an artifact of the radio flux correlation. The subtracted H alpha emission line profiles exhibit multiple components with one component associated with each star. The width of the subtracted H alpha emission line profiles is larger than can be accounted for by orbital motion and rotation. The H alpha emission integral was calculated from the total H alpha equivalent width and used to estimate the volume of the H alpha emitting region and the IR free-free flux. For the Ca II H and K emission core equivalent widths, the K line is variable and the H line might be variable. The peak intensities of the Ca II emission cores are variable. The Ca II emission cores exhibit multiple components, including a component from each star, a component corresponding to H epsilon and components apparently associated with the active star that have velocities ranging up to 250 km/sec.

For HD 219113, the H alpha equivalent widths and line profiles are variable. The equivalent widths appear to exhibit a phase variation. The Ca II H and K line emission core equivalent widths and peak intensities are variable. Multiple components, all associated with the active star, are present in the Ca II emission cores. The subtracted H alpha emission line profiles show multiple features, whose velocities indicate that there is a component present from each star in the system. The subtracted H alpha emission line profile is broad, with a full width at the continuum that is comparable to that for HD 22468. The H alpha emission integral was calculated from the total H alpha equivalent width and used to calculate the volume of the H alpha emitting region and the IR free-free flux.

For HD 118216, the H alpha equivalent width is constant and the Ca II H and K emission core equivalent widths and peak intensities are variable. The subtracted H alpha emission line profiles exhibit a central emission peak. The velocity of this peak suggests that there is a disk/shell about the hotter star in the system. The full width of the subtracted H alpha emission line profile is larger than that for HD 22468 or HD 219113. It is consistent with the velocity width for a disk/shell. The H alpha emission integral was calculated from the total H alpha equivalent width and used to estimate the volume of the H alpha emitting region and the IR free-free flux.

The following model is proposed for HD 22468 and HD 219113. The H alpha emission arises in a thick chromosphere about each star in the system. Such a model is consistent with the radio and x-ray observations and the optical photometry. For HD 118216, the alpha emission arises in a disk/shell about the hotter star in the system. A comparison of HD 22468, HD 118216 and Algol is given.

For the remaining 18 systems, the H alpha and Ca II H and K emission core equivalent widths are given. Representative H alpha and Ca II H and K line profiles are shown.