



# DAVID DUNLAP DOINGS

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*HAPPY CHRISTMAS!*

As usual, since December is a very short month academically, there will be no issue of the Doings next month. Those of us who prepare the Doings therefore take this opportunity to wish all our readers a *Happy Christmas* and *Prosperous New Year*.

Linda, Joan, Don.

To Our More Distant Readers

When the Doings began in January, 1968, it was a small in-house journal (it was, as Jack liked to say, never an outhouse journal) intended solely for the few dozen people within our Department. As people came to leave the Department, however, they usually asked that the Doings continue to be sent to them through the mail, and we have now reached the point where our external readership exceeds the internal readership by almost a factor of two (about 100 to 60 actually).

This, of course, is very gratifying, and no cause for complaint. But in an effort to stimulate more input to the Doings, it occurs to me that since most of you out there were once associated with the Department, and since many of your contemporaries are still readers of the Doings, it would be of interest to everyone to have more news of what our old friends and acquaintances are up to. May I therefore suggest - indeed urge - that whenever some new turn occurs in your life, a marriage, children, new position, or whatever, you take the time to scrawl a few lines on a postcard and let me know.

I may say also that I recently circulated an invitation to our internal readers to make any suggestions about the current structure and content of the Doings. Would they like new sections, a change in others, etc? Judged by the 5% response (i.e. three people), it seems there is a strong preference for the status quo, so there will likely be no great change in our format. Nevertheless, I will continue to welcome comments from any reader who has suggestions for improvement.

Don Fernie

COMINGS AND GOINGS

Bob Garrison was 'home' for a visit November 16-22, between an observing run in Chile and continuing his sabbatical at the Lick Observatory. As always, he reports superb weather at Las Campanas, with 14 out of 16 nights spectroscopically useable, and more than 60% of them photometric. He is not observing at Lick, but is continuing his classification of 5000 spectra of the 1300 brightest stars.

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Sidney van den Bergh was at an ASP Board of Directors meeting in San Francisco, November 12-13, and met with former students Andrew Leir and Chris Pritchett in Vancouver on November 14. On November 18 he was in Tucson for meetings of the CTIO Time Allocation Committee.

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Don MacRae and Bill Clarke were in Ottawa November 19 to attend meetings of the NRC Associate Committee on Astronomy.

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SEMINARS

With the depletion of our seminar funds it has become more difficult to plan seminars well-ahead of time. Instead, speakers are more frequently caught 'on the run', or local speakers are pressed into service. The past month has therefore seen a number of colloquia not reported in the last issue.

- Oct. 26    Mary Lane:            *Delta Ceti, An Interesting Beta Cephei Star.*  
          Rick McGonegal:      *Asteroids, Comets and Meteors: A Family Tree?*
- Nov. 2     Tom Bolton:            *HDE 235679 and The Binary Frequency of OBN/OBC Stars.*
- Nov. 9     Bob McLaren:          *Applications of 10-micron Heterodyne Detection to the Study of Planetary Atmospheres.*
- Nov. 16    Douglas Hall:          *(Vanderbilt University): The RS CVn Eclipsing Binaries.*
- Nov. 23    Claude Canizares:      *(MIT): X-Ray Bursts and Related Phenomena.*
- Nov. 30    Roger Beck:            *(Erindale College): Some Uses of Astronomy in the Study of a Roman Religious Cult.*
- Dec. 7     Don Fernie:            *Astrophysics in the Andes: Harvard's Early Days in Peru.*
- Dec. 14    *Christmas Countdown*

The following speakers are tentatively scheduled for January:

- Jan. 4     Kayll Lake:            *Ph.D. Thesis talk.*
- Jan. 11    Bill Sherwood:         *Topic to be Announced.*
- Jan. 18    Werner Israel:         *Topic to be Announced.*

P O T P O U R R I

Ron and Lynda Lyons have bought a house in Richmond Hill, and Lynda now has a new job as a part-time reference librarian in the North York School system.

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Bob Garrison reports a very heavy demand for time on our Las Campanas 24-inch for the first six months of 1977. Applications for some months were so heavy that several had to be refused or drastically diminished.

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Helen Hogg reports that her book 'The Stars Belong to Everyone' is now in its second printing by Doubleday Canada, and that it is on the list of books from which Literary Guild members make selections.

\* \* \*

Martine Normandin passed her Ph.D. Comprehensive Exam on October 6.

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We have learnt with regret of the death on November 13 of Ken Chilton, long-time RASC stalwart in the Hamilton Centre and President of the International Union of Amateur Astronomers. Several of the DDO staff were guests on Ken's local TV show at one time or another, and he was always enthusiastic about talks by us to the Hamilton Centre. In recent months, when the role of professionals in the RASC has come under severe attack, Ken was a stout defender of professionals' contributions to the RASC.

\* \* \*

Phil Teillet gave a talk 'The Solar System: The Formative Years' to the Toronto Centre of the RASC November 12.

\* \* \*

Don Fernie has discovered that he is now Vice-President of Commission 27 (Variable Stars) of the IAU.

\* \* \*

Good news for those who drive to the Observatory: Tom Bolton reports that the Richmond Hill Town Council has definitely approved funds for the paving of Hillsvie Drive next spring. Bad news for Tom and other observers: The householders

on Hillsvie Drive are demanding much improved streetlighting to go with the improved road. There has apparently been an increase in vandalism on Hillsvie recently, and residents are becoming fearful of walking on the street at night. All the more reason for keeping a vigilant eye out for unauthorized persons on Observatory property.

The Town Council is also considering the offer by the University of a long-term lease of part of our land facing on 16th Avenue for the construction of a public park.

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LETTER TO THE EDITOR

[The editor refuses to take responsibility for views expressed by correspondents.]

The Editor  
David Dunlap Doings

Dear Sir:

Permit me to elbow my way into these pages to tell our readers a piece of news they will all be delighted to hear: Donald Fernie's "The Whisper and the Vision" has just appeared in print\*.

Subtitled "The voyages of the astronomers", it is a book about "some of the people from the past who made astronomy what it is today". Le Gentil is there of course, in the first chapter, but along with him are a number of less well known transit chasers whose stories give us a global picture of the campaigns of the 1760's.

The next two chapters tell of Maclear and Herschel in South Africa in the first half of the nineteenth century and of Sir David Gill in the second half. The fourth is an account of two Pickering's and two Baileys and the Harvard station in Arequipa, Peru, very welcome because of our own involvement nearly a hundred years later in South American and southern hemisphere astronomy.

I am writing only to announce the book, not to review it. Let me assure DDD readers however that the same charming style which we have learned to anticipate\*\* in each "Final Item" is there in this book on every page.

I am, Sir, yours &

MR

\* Fernie, Donald, The Whisper and the vision, Clarke, Irwin & Company Limited, Toronto and Vancouver, 1976, 189 pp., \$10.95, ISBN 0-7720-1090-0

\*\* [You're sure that isn't 'expect', Don? - Editor]

PAPERS SUBMITTED

- J.D. Fernie                      Quasars: The Continuing Enigma.  
An Extension of a Geometric Method for Finding Cepheid Distances.
- Jim Thomson &  
C.T. Bolton                      New Observations of HD 218154.
- D.R. Gies &  
J.R. Percy                      Photometric Variability of 29 Cygni.
- P.G. Martin, J. Maza &  
J.R.P. Angel                      The Polarization of Nova Vulpeculae 1976.
- S. Jakate                      Photoelectric Photometry of AC And.
- P.P. Kronberg &  
R.G. Strom                      Two Frequency Brightness and Polarization Distributions in 3C123 and 3C427.1.
- S. van den Bergh &  
C. Pritchett                      Spectral Energy Distributions of Stars Derived from Fourier Transform Spectrometry.
- J.R. Percy                      The Pulsation Stability of Delta Scuti Variable Stars.

F I N A L   I T E M

Another Look at the Dinosaurs

Every field, I suppose, has its Fred Hoyle. Their popular books, avidly snatched up by the public, fearlessly advocate highly idiosyncratic views to the exclusion of most others. The public loves them; the Establishment groans. Well, the Fred Hoyle of palaeontology is likely Adrian Desmond.

Like Fred, Mr. Desmond comes with high credentials. He holds two graduate degrees from London University, one in palaeontology and one in the history and philosophy of science, and is presently associated with Harvard University. Dinosaurs are his thing, and in the course of his work he has come to the singular conclusion that most of what we've been accustomed to hearing about dinosaurs is all wrong. His views are now set out for the layman in a delightful book (just like Fred's) called *The Hot-Blooded Dinosaurs* (The Dial Press, New York, 1976).

The title tells all. What Desmond claims, with no little persuasion (just like Fred), is that the long-held picture of dinosaurs as giant reptiles is hopelessly awry. They just couldn't have been lizards. But before I go into some of his reasons for this claim, let me say that much of the charm of Desmond's book comes from his intimate knowledge of his science's history. He gives a clear picture of how dinosaur palaeontology developed from the first stunning discovery of a giant skull in the chalk quarries of Maestricht, Holland, in 1770, on up through the fierce and bitter debates that attended the advent of Darwinism in the nineteenth century ("Even a cursory glance at Marsh and Cope at war quickly explodes the myth of the sober, objective scientist...."), into the palaeontological arguments that continue now. Along the way are many human interest pleasantries. For instance, in 1853 the first life-size models of several dinosaur species were built in the grounds of the re-erected Crystal Palace in Sydenham, London. The project was celebrated by holding a dinner for 21 assorted scientists and dignitaries in the stomach of the Iguanodon:

The group regaled in sumptuous fashion and the revelries went on into the night as a succession of congratulatory toasts were proposed. When the banquet finished in the early hours the whole party of eminent scientists could be seen climbing out of the dinosaur and staggering across the park whilst singing all the while the merits of [the sculptor's] restorations! 'Potentates of the Wealden and the Oolite!' cried an incredulous *Quarterly Review*, '... dreamed ye ever, in your ancient festivities, of a race to come ... dining on your ghosts, called from the deep by their sorcerers?'

But Desmond's historical approach is to his purpose, for he shows that the idea of dinosaurs being reptiles was one adopted in the early nineteenth century, when very little was known of them, and that this idea became so much the canonical view that it has never been seriously challenged. He then proceeds to marshal what seem to be some very obvious physiological arguments to show that they simply couldn't have been reptiles.

For instance, we know cold-blooded creatures even in the tropics rely on sunshine to raise their temperatures to working levels. But the bulk of the larger dinosaurs was so great (equal to a dozen elephants) that calculations based on modern reptiles show it would take 86 hours of uninterrupted sunshine to raise the body temperature just 1°. Apart from the problem of finding 86 hours of sunshine, work on alligators shows that long before 86 hours were up the animal would have died from exposure, its hide frizzled. In other words, big dinosaurs were just too massive for the sun's heat to be conducted into their bodies in a reasonable time.

Yet, Desmond goes on to show, some dinosaurs were astonishingly swift and mobile. The ratio in length of thigh bone to shin bone apparently is a very sensitive indicator of speed in all animals, and on this basis some dinosaurs were better runners than the modern ostrich (40+ mph). Other dinosaurs could fly. In both such types any reptilian physiology would fail by orders of magnitude to supply the necessary energy.

But if you want to know all the arguments you'll have to read Desmond's book. Let me go on to the most fascinating question of all - the one where the astronomy comes in - what wiped out the dinosaurs? They were one of the most successful animal forms ever to inhabit the earth, ruling unhindered for 150 million years. And then suddenly, 70 million years ago, they were all gone in less than (perhaps much less than) a million years. Indeed, there was not a single species of large land animal left; the only survivors were a few small types of mammals, birds, and reptiles, and

they were seriously depleted. Even such things as the plankton and ammonites of the oceans were gone. What Armageddon devastated the earth?

There are several types of theory. For instance, that the emergence of new plant forms lead to toxicity of the food supply. Desmond has little trouble disposing of that one. No, apparently the most acceptable theory is still the old one that the devastation resulted from a nearby supernova explosion. The radiation level at the top of the earth's atmosphere is normally around 0.03 roentgens, but a supernova within a hundred light-years of us would drive the radiation level to a staggering 3000 roentgens. Now a lethal radiation dose for most laboratory animals is 100 to 700 roentgens, so the effect of such a supernova would be like a universal nuclear holocaust.

Yet the theory in that form won't work. Why were the tiny ammonites, sheltered by the absorbing sea, wiped out, while some land animals survived? The latest version of the theory, developed largely by Dale Russell in Canada, is that it was the secondary effects of the supernova that caused the catastrophe.

Suppose the supernova was rather more distant or less energetic, so the radiation dose wasn't quite that lethal. Yet the power of the on-coming blast wave would still be incredibly high, and the earth's atmosphere would absorb energy equivalent to around a million megaton hydrogen bombs. The effect on the climate would be horrendous, and can be shown to lead to steep declines in the surface temperature. It was this, plus some radiation effects, that did the killing.

Had the dinosaurs been reptiles they might have crawled into the safety of hibernation, but they were not, and were mostly too big to find shelter, so they quickly succumbed to the sudden cold. But the only mammals around at the time (the dinosaurs had been very successful at suppressing them) were small mouse-sized creatures that could burrow to survive, and the few true reptiles, like snakes, could hibernate. Incidentally, there were no very small dinosaurs, says Desmond, because small animals lose body heat quickly and the dinosaurs had no fur or feathers. Desmond traces the details of what might have happened to the other species.

So who knows? Had it not been for that supernova, perhaps the dinosaurs might still be on the rampage, and homo-sapiens might never have had the chance to evolve.

I have no idea how the palaeontological Establishment views Adrian Desmond, but, like the laymen for Fred, I'm on his side. And he might just be right. After all, even Fred is right sometimes. Isn't he?

J.D.F.