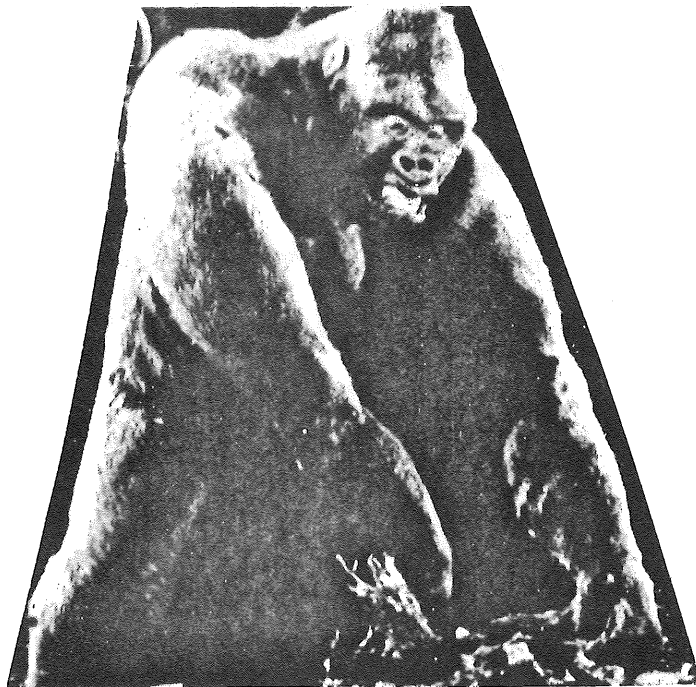


DAVID DUNLAP DOINGS

VOL. 10, NO. 3

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*Remembering the spectral
sequence*

see

Revisionist's Corner

GUEST EDITORIAL

The Radio Shack

The radio shack East of the Administration Building on the Observatory property was not always used to house radio receiving equipment. In the early stages of World War II the University granted permission to the Army for the land to be used for tests. The work carried on was classified, and to protect the equipment and results the property was patrolled by Army guards. As the patrolling was carried on 24 hours a day, housing was needed for the men.

The wood structure was originally erected further to the East and South of where it now stands. It held bunks and a cook stove - a cook is important! In true military fashion a rifle rack with rifles stood against one wall.

The work dealt with land mine detection and degaussing. Cables were buried about the grounds and mines planted. Very likely other work was done too.

Sometime after the shack was in operation winter closed in, and later a heavy snowfall made the lane impassable. The men used the telephone in the main building to keep in touch with operations and we learned they were expecting delivery of a gasoline-powered generator. It was suggested that the lane be plowed before the delivery truck arrived. A call was made to have the Army do the clearing.

Just before noon the plow started in from Yonge Street. It was a large four-wheel-drive unit fitted with a huge blade. Some of us watched from the second floor windows with great interest.

The truck, almost hidden by a plume of snow, roared up the drive. There was a wooden bridge with handrails spanning the creek then; crossing the bridge the plow cleaned off the handrails along with the snow. Rapidly the driver approached the building, made several passes over the parking lot, then with a cheery wave left in a flurry of snow.

After lunch a wind sprang out of the North and by three o'clock in the afternoon the lane was filled level with the snow banks. Around three-thirty someone saw a truck stalled in the road.

The men in the shack were notified and I and two others of the staff joined the men in a trek to the stalled truck. The driver was furious. "I thought this road was to be plowed!" With

some difficulty he was persuaded that the road had been cleared but three hours of strong wind had filled it in again.

A look at the situation convinced everyone that digging and pushing would be futile. After a conference and a suggestion from old "Mac" (the caretaker), the generator set was taken apart and sledged in. The sturdy sled belonged to "Mac's" sons. This was to be my last experience with the shack for sometime; the Navy was calling me.

After the war ended, the Army withdrew the men and equipment but left the shack standing. I believe this was done at the request of Dr. Frank Hogg through the University. Frank saw a good use for the shack as sleeping quarters for summer students who were night observers.

This was a real money saver for the summer students. They slept in the shack, made their meals in the Observatory kitchen, while being close to work.

After many years of this service, the shack was moved to its present location and renovated. Radio astronomy had arrived at D.D.O. and the Army shack became a radio shack. As radio observing became difficult because of local interference, the equipment was moved to Algonquin park. The shack then fell into a period of decline, used less and less as sleeping quarters by observers.

I see it brooding of the past as I do, remembering the parade of students who gladly used the convenience it provided.

Gerry Longworth

HELEN SAWYER HOGG, D.Sc., honoris causa, (TORONTO)

Last week was Sesquicentennial Week; the Royal charter of the University of Toronto is dated March 15, 1827. A convocation to mark the occasion was one of the most impressive in years. Receiving degrees were the Governor General and nine distinguished members of the University. Among them was our Helen, the only woman, utterly resplendent in her scarlet and gray gown and matching hood - "I can keep the hood, but they took back the gown" - and looking as if she was thoroughly enjoying the occasion, something that might not be said of some of the others.

With the Governor-General and the Lieutenant-Governor on the platform - a former Governor-General was in the audience - with graduands, the President and Chancellor of course, and presidents of sister universities in attendance from near and far, the academic procession overflowed to fill several rows on the floor of Convocation Hall with colourful regalia. A quintet of brass played from the balcony, the organ responded, and the Hart House Chorus sang the rollicking song, itself 70 years old but nowadays little-heard, "Toronto, mother ever dear".

The afternoon was full of pomp and colour but there was something more, a happy informality about it all. The G-G pretended to lose a page of his notes and thereby captured his audience, there were friendly allusions to the works and quirks of the honorary graduands who were so familiar to us all (Frye, Kelly, Shook, McLuhan, Patterson, Tuzo Wilson, Hogg, Harding, and Bissell), and we left feeling we had participated in a real family celebration.

Helen's DDO family was well-represented by colleagues from the academic staff, "old guards" from the support staff, and students. All enthusiastically applauded the laudatory remarks of Scarborough's newly appointed Principal, Joan Foley, who presented Helen for her degree. High above the platform was the blue, white and gold crest of the University. I wonder how many in the audience knew that its colours had been skillfully and artistically applied by Gerry Longworth in the DDO carpentry shop?

Don MacRae

COMINGS AND GOINGS

DDD's apologies to our new downtown secretary! She appeared in our last issue as Pamela Sutherland instead of her actual name, Pamela Sullivan. And so close to St. Patrick's day too.....

* * *

Irene Priestley resigned her position as typist at the Observatory (effective March 25) in order to take on her forthcoming role of mother. This may give new meaning to the old song 'Goodnight, Irene'. We wish her well!

* * *

In Irene's place we welcome Mrs. Lyn Miller, formerly secretary to the Dean of the School of Music, but one who prefers the rural life. Lyn joined us March 7.

* * *

Christine Clement gave a talk to the Toronto Centre of the RASC on March 14 about various European observatories and globular clusters which are interesting to view through a telescope.

* * *

Rick Salmon, erstwhile Las Campanas resident observer, writes from Edmonton to say he is doing well in his first year of a two-year Electronic Engineering course at the Northern Alberta Institute of Technology. He is hoping to be in Toronto this summer.

* * *

Gerry Longworth, and also Helen Hogg, were guests at a reception and dinner given by the Lieutenant-Governor of Ontario on March 14.

* * *

Chris Rogers returned from Seattle for the week of March 19-26 to continue working with Peter Martin. They are computing models of scattering by spheroidal particles to interpret interstellar polarization.

* * *

Helen Hogg gave a seminar on Variable Stars in Globular Clusters in the Chemistry-Physics Seminar Program at Trent University on March 4. On March 17 she spoke to the Women's Canadian Club of Toronto on Down to Earth in Astronomy.

* * *

Sidney van den Bergh has been talking up a transcontinental storm with seminars on New Observations of Early-Type Galaxies at the University of California, Santa Cruz, February 4; U. C. Berkeley, February 8; and U.C. Los Angeles, February 22. Then on The Influence of Environment on Galaxy Morphology at U.C. Santa Cruz, February 16; U.C. San Diego, February 23; and McMaster University, Hamilton, March 9.

On February 25 he was at Kitt Peak to work on NGC 5128 with Reg Dufour, using the 'picture processing' facility, while somewhere along the way he spent a night at Lick to see the Wampler scanner in action.

He may be glimpsed, albeit heavily red-shifted, at the DDO during March and early-April.

* * *

SEMINARS

March seminars were as listed in the last issue of DDD, with the addition of "The Relativistic Roche Problem: A Skeleton in the Closet", given by Dr. Eli Honig of Scarborough College on March 29. April seminars are scheduled as follows:

April 5: Dr. Dale A. Russell, Chief Paleobiologist, National Museum of Natural Sciences, Ottawa, "The Supernova Theory of Dinosaur Extinction."

- April 12: Dr. John Landstreet, University of Western Ontario
"Magnetic Fields in Upper Main Sequence Stars."
- April 19: To be announced.
- April 26: Dr. Thomas G. Barnes III, University of Texas.
Title to be announced.

P O T P O U R R I

DDD extends congratulations to José and Violeta Maza on the birth of their daughter, Gabriela, on March 6.

* * *

Bob McLaren draws early attention to the forthcoming meeting of the Optical Society of America at the Royal York Hotel on October 11 - 14. Two items of interest there will be a symposium, Advances in Far-Infrared and Sub-Millimetre Waves, and a short course on Charge-Coupled Device Detector Arrays. Bob is on the Local Organizing Committee and can provide details (such as that graduate students may register for the meeting without charge).

* * *

The following is reproduced from Astrophysical Journal Letters, vol. 211, page L107, 1977:

ALUMINUM-26 IN THE EARLY SOLAR SYSTEM: FOSSIL OR FUEL?

TYPHOON LEE, D. A. PAPANASTASSIOU, AND G. J. WASSERBURG
The Lunatic Asylum, Division of Geological and Planetary Sciences,* California Institute of Technology
Received 1976 August 30; revised 1976 October 21

Would Chandra have accepted a paper from a guy called Typhoon writing from The Lunatic Asylum??

* * *

A letter from Dave Hanes brings greetings from our growing colony in Cambridge, England: Dave and Ros Hanes, Serge Pineault, Barry and Kathy Madore, Simon White. Word is that the daffodils are blooming and that Ros thoroughly enjoys being able to play field hockey right through the winter!

PAPERS SUBMITTED

- | | |
|---|---|
| R.F. Garrison, W.A.
Hiltner & R.E. Schild | MK Spectral Classifications for Southern
OB Stars. |
| P. Kronberg, E.M. Burbidge,
H.E. Smith, & R.G. Strom | The Radio Structure and Optical Field at
3C 303. |
| P. Kronberg, M. Reinhardt,
& M. Normandin | On the Intergalactic Contribution to the
Rotation Measures of QSO's. |
| P. Kronberg, S. van den Bergh,
& S. Button | Radio and Optical Structure of Cygnus A. |
| S. van den Bergh | The Apparent Flattening of Galaxies. |

REVISIONIST'S CORNER

Generations of graduate students have grown up on Henry Norris Russell's famous mnemonic for remembering the ordering O B A F G K M (R N S) of the stellar spectral sequence: Oh Be A Fine Girl, Kiss Me Right Now, Smack! Alas and alack! This has now been declared pure male chauvinism, and the search is on for a new mnemonic. A recent issue of Mercury Magazine reports early results from Owen Gingerich, who sponsors such a contest among his students at Harvard. A brief sampling:

Oh Bring A Fully Grown Kangaroo, My Recipe Needs Some

Oh Brutal And Fearsome Gorilla, Kill My Roomate Next Saturday

Oven-Baked Ants, Fried Gently, Kept Moist, Retain Natural Succulence.

Mercury is offering a prize for the best.

FINAL ITEM

The Roosevelt of Astronomy. III.

Lowell's expedition to Chile was so widely publicised that its mailing address was simply 'Lowell Expedition to the Andes'. The actual site proved to be a matter of some dispute between the expedition's members, Lowell's forceful personality being absent, and a good deal of ill-feeling was engendered between Lowell's assistants and Mrs. Todd, wife of the expedition's leader, whose convictions seem to have been in inverse proportion to her scientific knowledge. Todd himself took a rather casual attitude to everything, and, as one report back to Flagstaff had it, "I guess he must always ask Mrs. Todd; she seems to wear the trousers."

However, by June of 1907 they were camped out at a point about 70 miles inland from Iquique (almost 700 miles north of Las Campanas). Here, on the floor of the desert they erected the 18-inch refractor sans dome or other shelter, since the probability of precipitation was absolutely nil. The assistants began the taking of 13,000 photographs of Mars, and almost immediately proclaimed the presence of canals on them. To the annoyance of the assistants, however, Todd found himself unable to see the canals ("Mr. Todd's eyes are not good and he cannot see them"), but he amiably passed on the good news to Lowell, adding "As they looked at these photographs and then flew over the pampas, even the bats [of the desert] screamed *oasis, oasis, oasis - canali, canali, canali!*"

It was the same old story, of course. Lowell might issue lofty proclamations of success, he might subsequently expostulate and exclaim, but without the eye of the believer the canals remained elusive.

But Lowell did not rely altogether on such direct attempts at proving his claims. To bolster his general theory of Mars as the abode of life he wanted more evidence on the physical conditions that prevail there, the composition of its atmosphere, and the like. Thus he came to invest in one of the finest available astronomical spectrographs, and hired a young man named Vesto Slipher to run it. Slipher's career was almost cut very short when, finding the adjustment of the spectrograph difficult, he innocently suggested to Lowell that he visit Lick Observatory to learn the techniques from the experts there. The bellicose Lowell would sooner have had him set foot in hell, and told him that while everyone has difficulties, only the stupid go running to others for help!

In retrospect it is clear that Slipher shared very few of his director's beliefs or enthusiasms. He dutifully took the plates Lowell demanded, but they proved of little help. (Slipher would offer them to Lowell, saying he thought they were inconclusive; Lowell would then publish a report announcing another major breakthrough.) But when Mars was unavailable for observation, Slipher was allowed to take up his own research interests. He turned to the spiral nebulae, discovering their very large radial velocities and rotational velocities,

and thus laying the spectroscopic groundwork of modern observational cosmology. Eventually, his quiet but illustrious career would span 36 years as Director of the Lowell Observatory after Lowell's death; he was 94 when he died in 1969. History has pronounced him a vastly better astronomer than Lowell, yet to Lowell he owed his start.

While Slipher worked on nebulae in the off-Mars periods, Lowell turned his attention to Mercury and Venus (although spectrograms of Venus were frequently called for too). An early Lowell map of Mercury shows its surface criss-crossed by lines, but it was his views on Venus that would excite the Lick observers to new heights of sarcasm. Venus, he firmly declared, was most certainly not cloud-covered, but instead showed permanent markings which resembled the spokes of a wheel. These, however, unlike the case of Mars, were quite clearly naturally occurring features that did not speak for a resident civilization. The ensuing Lick-Lowell battle reached such proportions that at least one newspaper gleefully wrote it up under the headline "The Strife of the Telescopes." As usual, the popular press was on Lowell's side: "Astronomer Holden, being jealous of the implied reproach upon his great telescope and the 'glorious climate of California', denies the conclusions of [Lowell]....."

But it was the canals of Mars to which Lowell returned indefatigably again and again up to the very time of his death (of a massive stroke on November 12, 1916). It is amazing how year after year for over two decades he managed to keep the controversy blazing, although it is clear that without his highly coloured personality and habit of claiming the most outrageous conclusions as incontrovertible, interest would have died out much earlier. Even so, the public did weary of it all at times. "We have been getting a little more astronomy than usual this autumn," sighed *The New York Times* in November of 1907, "and some of it has been very poor astronomy....."

Now that we have finally achieved a close-up view of the Martian surface from spacecraft, and have indeed seen the giant rifts and canyons that are there, is there any vindication of Lowell's claims? Sadly, no. A detailed comparison between Lowell's maps and modern spacecraft photographs has already been made by Carl Sagan and Paul Fox, and their conclusions are quite specific: "A small number of canals may correspond to rift valleys, ridge systems, [etc]. But the vast bulk of classical canals correspond neither to topographic nor to albedo features, and appear to have no relation to the real Martian surface."

Probably the real explanation of the canals lay in an experiment done as early as 1903 by Walter Maunder in England. He asked a group of Greenwich schoolboys to copy a canal-expurgated picture of Mars, without telling them what it was, and without presenting it too clearly. Their copies showed the tell-tale lines joining isolated features. Concluded Maunder: "The apparent lines on Mars are simply the integration of the eye of minute details too small to be separately and distinctly defined..... The canals have no more objective existence than those which our Greenwich boys imagined they saw..... It seems a thousand pities....." Lowell, of course, brushed it all aside with a scornful reference to 'this schoolboy theory'.

There is one last irony to Lowell's astronomical endeavours. In his later years he became absorbed in the probability of there being another planet beyond Neptune. Like Adams and Leverrier before him, he used the observed perturbations of the known outer planet to predict possible positions for what

is now Pluto. In fact, we now know that his calculations could not have succeeded, but he, of course, was satisfied with them, and instigated a massive photographic search for the planet at the Lowell Observatory. He died without its being found, but of course it was eventually found on plates of the Lowell Observatory in 1930. The irony is that once its place and motion were measured, the later Lowell observers found that Pluto had indeed been photographed twice on Lowell plates of 1915. Had those plates been properly blinked Percival Lowell would have departed this world in a much greater blaze of glory and respect than he eventually did. (There is, in fact, a double irony here. William Pickering also predicted a trans-Neptunian planet - several indeed - and he had a photographic search made at Mt. Wilson. Plates taken there in 1919 also showed Pluto, and again it was missed.)

How then to summarise Percival Lowell? He had the makings of greatness: talent, tenacity, courage, and strength, yet with an underlying kindliness that could belie his bellicosity. He had wealth and prestige to back him. The one fatal flaw was a total lack of scientific judgement and intuition, which, for one of his position and personality, in the end proved unforgivable to his peers. As the Roosevelt of astronomy he should have heeded his namesake's famous remark: Keep your eyes on the stars, but your feet on the ground.

J.D.F.