



NEWSLETTER

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ECLIPSE 1970

It was rather a special eclipse. Not every eclipse has the moon so near the earth that an observer can see totality for over two minutes. Very few indeed conveniently go on display all up the Eastern seaboard of the U.S.A. which is rather well supplied with laboratories, observatories, people, and even one or two rocket ranges. Many of these are perfectly placed within the eighty mile wide path of totality. Even less probably, in Nova Scotia, where the centre of the totality path was precisely along the South coast, a second total eclipse will pass over the same place only two years later. The paths coincide where the latitude happens to equal that of the ionospheric observatory at Ottawa.

The sun is "switched off" every night, but so slowly that many of the more rapid ionospheric processes cannot be observed. In an eclipse the sun is switched off much more rapidly. One can measure how the ionosphere follows the sudden drop in the sun's brightness, and measure the "sluggishness" of the ionosphere.

The Canadians, through their National Research Council decided to contribute to the world programme of observations of this eclipse by flying four rockets to measure the ionisation in the D and E regions, and to try to relate this to the sun's brightness. They invited us to contribute experiments to measure solar intensity at wavelengths relevant in the D region, namely the far ultra-violet (Hydrogen Lyman alpha at 1216\AA) and the X-Ray spectrum (1.5 to 10\AA).

We had about six months in which to prepare the experiments for eclipse day 7th March 1970. Some development work was needed mainly to get the extra

sensitivity to measure a very obscure sun. Integration checks took three weeks in January in Winnipeg. There Tony Hall discovered the significance of what Canadian meteorologists call the Chill Factor. This is a sort of negative cold bonus. The temperature outside may be -40° , but if there is a wind your bones may inform you that it is -60°C . The chill factor is 20° !

I had no idea what to expect in Nova Scotia. The map shows the South coast to be basically a straight line running WSW to ENE, but drawn by someone with advanced Delirium Tremens. Having seen the coastline I can now vouch for the sobriety of the cartographer, although the mapping could well have driven him to drink. The coast is a mass of bays, islands estuaries, rocks, lakes and harbours. Each feature is itself tortuously indented and each indentation has rocky protruberances and so ad infinitum (knobbly barnacles on the rocks?)

Pine forest extends to the water's edge, more exactly to the edge of the sea ice. This extended about a mile offshore in places, when we arrived, but receded rapidly during the fortnight that we were there. Being salt ice it didn't thaw like civilised ice, which is either there, and hard, or not there, and wet. Instead it went to a white pulp which was a realistic imitation of ice until you tried to walk on it Not quite Richmond ice rink.

We arrived on February 23rd at Halifax airport and were driven in a gentle blizzard, a large station waggon and a series of graceful skids, seventy miles Eastwards along the tortuous marine Highway to Sheet Harbour. We stayed in an historic hotel (anything over 100 years old is historic in Canada), founded in ca. 1860 by one Theobald Conrod, and now owned by Frazer Beaver. (Beaver may be named after the rodent, but Conrod ...?) At the hotel Tony was able to demonstrate his virtuosity in audio frequency modulation, on the electric organ belonging to Mr. Beaver.

The rockets were to be launched from a temporary launch site established at East Quoddy, about twelve miles East of Sheet Harbour, on a spit of land called Smith's Point. Everything happened on Smith's Point. The four launchers were at the seaward end, while the entrance gate at the north end was barely 600 yards away. In between were the Rocket store, the meteorologists accoutrements for balloon sonde launching, tracking and wind analysis for impact prediction, then there were trailers for the triplicated telemetry receivers, the experimenters, and the range safety officer, and for the ground transmitters for Dr. Belrose's experiment, complete with four 100 foot masts carrying his square array of dipole

transmitting aerials. Lastly there was a trailer referred to as the "Guard Van" from which trespassers could be repelled from the site and in which we, the press or others could be briefed, harangued, or fed as the case might be.

The objectives were to fire one rocket 75 minutes before totality, in full sun, and then to fire the other three in quite rapid succession, at totality, at totality plus 2 minutes and at totality plus 8 minutes. Since each rocket would be in the air for about 6 minutes we would have two rockets in the air at once, for several minutes. This meant that the last three rockets needed separate telemetry frequencies. Hence the triplicated receivers.

Immediately on arrival at the range Tony and I had to check out all twelve experiments (Lyman Alpha, X-Ray and Solar aspect experiments, four times each). A few long days and all our experiments were checked, fitted to the payloads, and working.

The rockets were Canadian Black Brant III vehicles, single stage, 10" diameter, solid fuel, each launched off a separate rail type launcher. They were spin stabilised by virtue of canted fins, but were despun from 8 to less than 1 rev. per second shortly before the clamshell nosecone was ejected. Release of the nosecone exposed our sensors to the sun, and allowed deployment of the Langmuir Probes which Dr. McNamara, the chief experimenter, was flying to measure electron and ion densities. The nosecone also had to come off to make Dr. Belrose's experiment work, as only then could his receiver detect the R.F. pulses from the ground station, and measure Differential Absorption. If those clamshells refused to open, the mission would be a write off, so we were interested to see what held them on. It was a short stainless steel hawser, the same multistrand high tensile wire that is used in a yacht's rigging. This held the two halves together and was to be cut by an explosive chopper. I visualised the mess that wire would make of an ordinary chopper but tried to share the Canadians confidence that the very opaque stainless steel shells closed over our precious experiments would deploy when the clockwork timer, started by the thump of launch, had counted off 45 seconds to the appointed time.

The payloads were not to be recovered after flight, so all our data was to be obtained from the Radio Telemetry link, using I.R.I.G. on frequencies around 250 MHz.

Six days before the eclipse there was the first of the planned dummy count-downs. In this operation everything was done except the pressing of the firing buttons. In fact a few artificial catastrophes were put in. The mains electricity supply failed, and we switched to the two diesel generators for auxiliary power (there was also a spare diesel generator!). We had a surprise as we were told that

our experiments were drawing double the expected current on two rockets. Perspiration. Feverish checking of our signals. We found no fault in them. Then we realised that both the rockets affected were sharing one ground power supply. It was the meter not the current that was wrong. The Canadians changed their meter, and we breathed again.

The dummy run was so successful that no more were required. This was just as well, because the Sheet Harbour disease struck almost the entire crew. We English were spared, and the reader will be spared details.

We next suffered ordeal by visitors, with the N.R.C's own photographers making a comprehensive cine record, followed by the Press, and then by the C.B.C. radio coverage, with tape recorders, interview and short dummy count downs and nauseam.

The day of the Eclipse was a long day. The launch team were on site at 0200 hrs. We were on site at 0500 hrs. The count-down went on, about an hour ahead of schedule. Two things could stop the firings, either high winds, or ships in the target area. There was no wind but eight ships, with about three hours in which to get rid of them. The lobster fishermen were obliging and stopped to fish just outside the danger zone. The Russian trawler obediently steamed radially away from the predicted point of impact. The American ship's radio operator appeared to be having his coffee break, and they steamed radially towards the impact point, where they would arrive just as we were due to fire our first at 1343 hrs. Fortunately they heard us at 1200 hrs and got out fast.

We had cameras ready to photograph the spectacular solar corona at totality, and to take progressive shots of the occulting disc. We had worked out that one needs a x10,000 filter to photograph the sun itself, and we had one at the ready. Relentlessly during the morning the sky clouded over and was opaque just in time to obscure the occulting sun completely. This meant we could concentrate on photographing the rockets (and on monitoring our experiments!). Our efforts were rewarded.

The rockets all went off with split second accuracy. The clamshells worked everything worked. Even the eclipse was on time. Although obscured by cloud the rapidity of darkening during the final minute is most impressive, and one can well understand the fear produced among primitive peoples.

After the eclipse was over there was a marked "rosy glow" particularly over East Quoddy. It is not normal for a rocket flight to be perfect. Four essentially

perfect flights are worth celebrating. This we did, at lunch next day in the Guard Van, with Crackling Rosé wine and 80 (Eighty) lobsters between 30 of us. They were cooked for us by the nearest local inhabitant (who lived 20 yards away!) by name Byron Publicover, and with a name like that, no wonder he could cook lobsters.

P. H. G. Dickinson

PLANTAPHOBIA

or

HOW TO BECOME AN EXPERT WITHOUT REALLY TRYING

by

FLORRIE BUNNDA

There are three essentials in gaining a reputation as a house-plant expert:

- (a) A couple of good reference books,
- (b) A love of all things green and beautiful,
- (c) An ability to "chat up" the plants.

If the plants don't like you then you might as well give in with a good grace. My husband is firmly convinced that, if not actually a "nut case", I am at least teetering on the border-line - with good cause, I must admit. After all, it must be a little alarming to enter a room and overhear one's spouse addressing a bunch of leaves or a fierce-looking collection of prickles, with such words as "And how's mummy's baby this morning then? Do you want a little drinkie then?" But as all house-plant addicts will bear witness - it works. They blossom and flourish with cossetting!

My husband long ago gave in with a good grace - in fact he now comes home on occasion with the odd pot to increase the "family" (totalling 90 at the last count!) He's still a little wary at times though - there is one large pot of what looks like green clutching fingers which he is convinced is going to seize him one day if he doesn't maintain his guard! There is also a very large "totem-pole", desert-type cactus, too large to stand anywhere but on the floor, which makes an excellent house-guard. Affectionately known as Old Bill, he waits beside the front door to catch the unwary, bending. Moral - never bend over too close to Old Bill - he will get you in the end!

The "mania" began with me some years ago when a friend came to dinner and brought as a gift, a pot containing four cacti and succulents. Of course, they died,

I killed them with kindness by drowning. However, the seed was sown, the damage was done and I soon began collecting and propagating, learning at first by trial and error.

A good memory is an asset when acquiring one's (albeit spurious) reputation as an expert. Every time a new plant comes into the house, I consult the authority and learn the latin name. How much more impressive it is when somebody comes to you and says "I'm having trouble with my rubber plant" and you reply "What have you, a Ficus Decora or a Ficus Elastica?" Mind you, it does earn one the odd sidelong glance! Seriously though, part of the fascination of plant-growing for me is knowing the specimens by name. My own particular weakness is for cacti and here it is a little more difficult to classify them. There are so many specimens to a group name - I have a Cereus Winterianus and a Cereus Peruvianus and they are not really a bit alike! Take the Opuntias also. I have an Opuntia Subulata and an Opuntia Tunicata and various odd specimens of common or garden Prickly Pears but the similarity ends with the name. And what a collection of Mammillaria there are!

If you intend to take house-plant growing as a serious hobby, the reference books are absolutely vital. Each new plant you acquire should be "read-up" and its likes and dislikes noted. So many plants wither from under-watering, over-watering, lack of light, being placed in strong sunlight, lack of heat, too much heat, not enough humidity, draughts, etc. etc. Some plants like a daily spray with tepid (never cold) water, some must never be watered from the top because the leaves will rot (African Violets and Peperomia for instance).

Some enthusiasts prefer to prepare their own soil but I have found that the purchase of a bag of Levingtons is quite adequate. All plants appear to flourish in this soil. For propagation, Levington's rooting compost is ideal, later moving the rooted cuttings into Levingtons potting compost (I assure you, I am not being paid commission by Levingtons for this advertisement).

As I have said, one learns by trial and error and I have discovered by bitter experience that if one owns a large collection of plants it is advisable to avoid adding plants subject to attack by aphid. I have found two such plants recently - Cinneraria and Fuschia - the little beasts seem to love them, and once well established on the plants they are almost impossible to vanquish.

Regular feeding with a good liquid manure such as Bio is very beneficial to most succulents and flowering plants - not the cacti, it's a little rich for them.

As a rule, feeding is only necessary in the growing season, as the majority of plants have a rest period during the winter months (I must point this out to my various Ivies, - they've been going mad during this winter!) The plants, of course, do not always obey the rules. I have been waiting patiently for about a year now for a cutting of a "Shrimp Plant" (*Beloperone Guttata* to you) and I am still waiting because the stupid plant refuses to stop flowering. "The Book" says quite distinctly that "the plant does not flower during the winter", but it seems that this particular Shrimp Plant has not read The Book. The circumstances however, are a little unusual because this plant is owned by a friend (come along to the Typing Office and I'll introduce you), who can grow flowers on plants on which nobody else has ever been able to grow flowers!! I don't know by what magic incantation she does it, but there they are, blooming away for all the world to see.

A word about pots. In my experience, clay are preferable to plastic pots. It's probably just one of my fads and fancies but the plants appear to be happier in clay pots - probably because, being porous, there is not so much chance of the roots becoming clogged if one is a little heavy-handed with watering.

I could not, of course, complete this article without a mention of the fine display of attractive plants adorning the windowsills of the typing office. Everyone must have seen them at some time or other. The "green-fingered" lady who owns them, Eileen Barnes, has contributed to many a collection of plants by the cuttings which she so patiently cultivates and distributes among R.S.R.S. plant addicts.

Staff News

Congratulations to:-

Anne and Mick Reid, on the birth of their son Nathanael Paul, on April 13th.
Freda and Reg Parker, on the birth of their son, Robert Mark, on April 2nd.
Paul and Anne Gardner on the birth of their son on April 22nd.
Margaret Duffin and Mike Cleverley, on their marriage at St. Martin's Church, Knebworth, Herts, on April 14th.

Welcome to:

R. Walls	H.E.O.
J. H. M. Bailey	E.O. 3 yr. fixed term (training for Falkland Islands)
E. C. Mackenzie	Sandwich Course Student
H. J. Convey	Sandwich Course Student
Miss J. Roy	S.A. (perm.)
J. Ford	Local Recruit Falkland Islands

Resignations

A. A. Handley Ex. Off. (Transfer)
Miss V. May Clerk/Typist (Falkland Islands)
Mrs. F. M. Parker C.O. (part-time)

Other Changes

R. D. Galley A.E.O. (perm.) (arrived Falkland Islands)
R. Sizeland A.E.O. (fixed term) (arrived Falkland Islands)
R. J. Cathrew E.O. (returned from Singapore)
Mrs. D. Baldwin C.O. (part-time) reduced hours, now part-time in Accounts
D. A. Cowcher E.O. (returned from Falkland Islands)

News of former Staff

All at R.S.R.S. will be glad to learn that Prof. F. G. Smith is now a Fellow of the Royal Society; we offer our congratulations to him on achieving this recognition of his contributions to science.

Sports and Social Club News

Cricket

At the cricket section AGM held on 16 April the following were elected to the committee for this season:

Eric Dunford - captain
Aly Moosajee - treasurer
Graham Thomas - secretary
Peter Davies
David Eccles

This season we have decided to introduce a rota system whereby members of the section will regularly assist in the preparation of the pitch. We also urge members to complete and pass on the monthly 'availability lists' without delay.

The first match is on 5 May and lunchtime practices should soon be under way. Newcomers with any cricketing experience, however limited, will be very welcome.

Graham Thomas

Wine Circle

The circle has purchased several items which members may borrow. These are:-

A book, "Successful Wine and Beer Making" by S. M. Trifton.

A corking machine

A hydrometer

A pump syphon

A foil capsuler

When the order which was recently placed with Grey Owl, Ltd., arrives, the following additional items will also be available for loan:-

A second corking machine

A Crown capping machine.

Stocks will be kept of Campden tablets, bottle corks, foil capsules, Crown caps and "Handy" fermentation locks.

Frank Bennett

Station News

A one-day symposium on The Lower Ionosphere and radio-wave propagation will be held at R.S.R.S. on April 30th.

Mr. Dalziel and Dr. Dunford visited the NASA Space Science Data Center and the University of Iowa for discussions with Dr. L. A. Frank about the American experiments which will be included in the UK4 satellite. Mr. Lane attended a NATO meeting of the Advisory Panel on Radio Meteorology, in Oslo.

Letter to the Outstations

Dear Colleagues

One of the pleasures of earning one's living in the geophysical trade is meeting and talking with the travelling men. I don't mean tinkers, though the more practically gifted experimenter could probably copper-bottom a pot with the best; the reference is to those who come and go on conferences, data harvesting expeditions, rocket launches and the like. They form a company of Wandering Scholars whose logic-chopping relates more to the pin-point density of heavenly electrons than to angels. Their transit through or return to Ditton Park gives even the stay-at-homes a feeling of communion with the more civilized parts of the outside world.

The migratory patterns of these peripateticks is in some measure revealed by the List of International Conferences; this serves also to indicate the trendiness of particular subjects, giving, as it does, the title and location of the various colloquia, symposia and what-have-you. I am therefore particularly grateful for having had pointed out to me the following offerings which show clearly how the world wags. Thus says the list:

'Stockholm, 15th Nobel Symposium on the Control of Human Fertility', and very reasonable too you might think; but stay, what have we here - 'Paris, International Rape Conference'! Well well, this is indeed an International Geophysical Union, of the earth most earthy. One thing's for sure no travel grant or subsistence is payable to delegates to that jamboree, the treasury considering that the work is of itself its own reward.

All this sort of thing reflects the general way of life; why, only the other day I was myself recipient of congratulations, misplaced but kindly meant, on the birth of an offspring. How deep rooted are our defence mechanisms; at one bound some quarter-century was annihilated and in a Pavlovian reflex the phrases taught to a young soldier came flooding from my lips - 'I never touched the girl and anyway was abroad at the time, it was two other fellers' etc. etc. The incident, if it did nothing else, served as a reminder that unplumbed depths of mendacity exist even in those as guileless as,

Yours sincerely,

The Editor

APRIL 1970

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INTERNAL MEMORANDA - NIL