

The Astronomical Society of Edinburgh

Journal 40 - December 1999



Harry Ford's modified Scotch Mount

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From the President

Welcome to Edition 40 of the Society's Journal. We have to thank Dave Gavine for editing this edition - and the other 39! Unfortunately, Dave has great difficulty in getting members to contribute articles so please consider writing about your astronomical interests whatever they might be - from reviews of books you have enjoyed to observations you have made.

We have had quite a good year what with the eclipse and the Leonids - although the weather could have been a little more helpful for both these events. Charlie Gleed and Jim Douglas have continued to work on the Earlyburn site and we hope to start using it in the evenings soon - weather permitting.

Recently the Observatory has featured in a BBC Scotland TV series in which Brian Kelly (formerly Dundee's City Astronomer) may be seen sitting on the roof of the Playfair Building in a pink inflatable plastic arm-chair talking about aspects of astronomy. The BBC's generosity extended to a very nice financial donation - and the inflatable chair which is now in the library!

Your Council has been concerned about the cost of running the Observatory. This year we have received bills for £1,000 in rates and £1,800 for water rates. Jim Nisbet complained about these bills to the City and the Water authority and Graham Rule raised the matter at the Calton Hill Advisory Group and it now seems likely that we will be able to reduce the water rates by having a meter installed and get a rebate on our rates.

There have been a number of groups at the Observatory with some Cubs and a group from Peebles Baptist Church both being lucky enough to have clear nights. If you are involved with other organisations perhaps you could interest them in a visit to the Observatory. Get in touch with Graham Rule or myself to discuss the arrangements. We can also give talks elsewhere. Jim Nisbet, Graham and myself spoke to a group at Vogrie Country Park and Graham gave a talk on the history of our Observatory to Morningside Heritage Association.

The event organised by "Tam the Gun" took place at the Hill as mentioned in the last Journal although the Gun itself was not fired from the hill. However there is an older time signal in Edinburgh. The time ball was installed at the Nelson Monument nearly 10 years before the one o'clock gun was set up. The U.S. Naval Observatory is encouraging cities around the world that still have working time balls to drop them at midnight on 31st December and Graham hopes to do the necessary to include Edinburgh in this world-wide celebration of this form of time signal. Charles Piazz Smyth set up the time ball in 1852 and Graham's dedication to the historical heritage of the Calton Hill is such that he is willing to spend his hogmanay at the top of the Nelson Monument - keep an eye out and make sure his watch is accurate!

Whether you are an *active* or *armchair* astronomer, or mixture of both I hope you will find that the Society's programme of events and activities has something for everyone. We are always open to suggestions - let any of the Council members know if you have any ideas for future events or activities.

Remember that the Society is open every Friday night and if the sky is clear members can use the telescopes for observing. Views of Jupiter and Saturn through the telescope are particularly impressive in the evening sky this winter. The Society is purchasing a new set of eyepieces to supplement the meagre two currently owned.

Even if the sky isn't clear please consider coming along for chat with other members about astronomy (or anything else for that matter). May I wish all of you a good festive season. I look forward to seeing you in the new year.

Alan Ellis

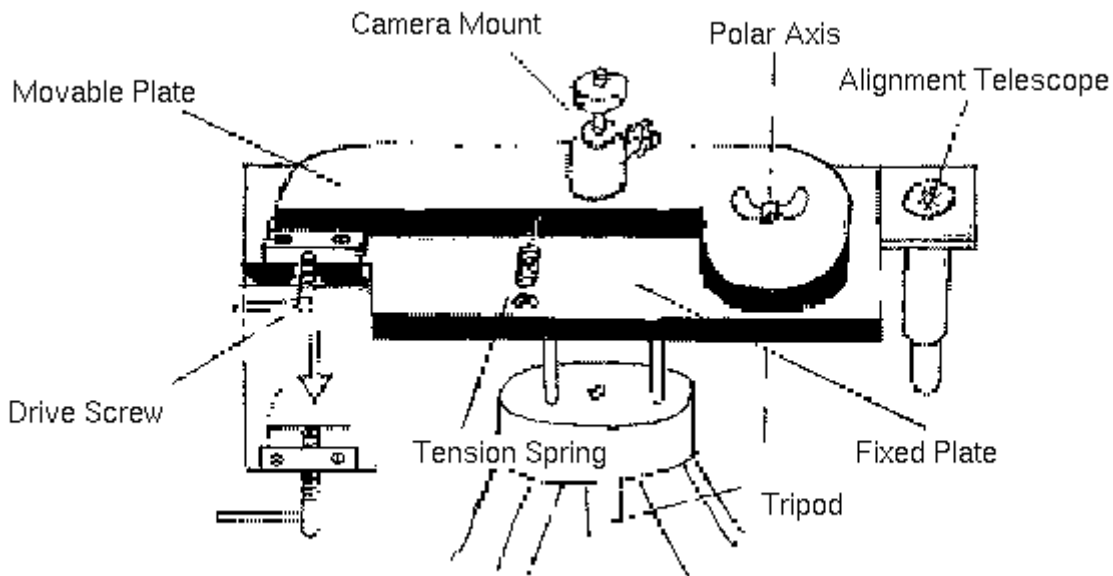
Cheap Astrophotography - a Variation on the Theme

It was great to see Dave Gavine extolling the virtues of the good old "Scotch Mount" ([A.S.E. Journal No. 39 - Summer 1999, Cheap and Easy Astrophotography](#)). I built my drive as long ago as 1982, but my experience with hinges has suggested a variation leading to a more stable platform and a smoother drive.

Hinges tend to have lots of play in their movement leading to inaccuracies even during short exposures. I have had stars appearing as short corkscrew trails due to what can only be described as a cycloidal wobble in the hinge. In which case how about keeping the Haig Mount with its "magic number" of 229, but have the camera weight bearing down on sliding melamine surfaces, one moving over the other which is fixed. These I cut from an MDF shelf.

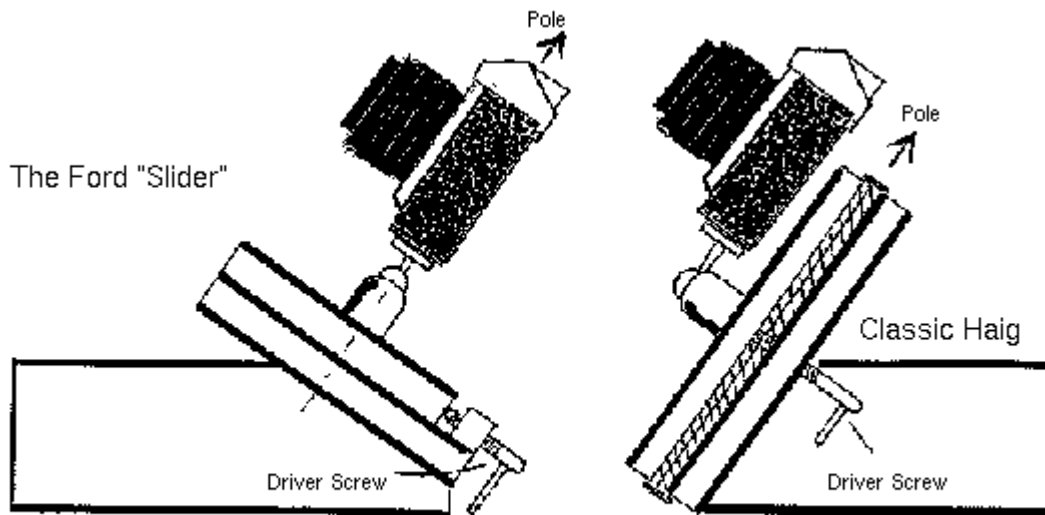
Instead of the polar axis formed by the long axis of the hinge, a solid nut and bolt joins the two surfaces. The upper "plate" carries the camera and is driven over the lower by the standard ratio screw at its pre-calculated distance from the centre depending on pitch. By cutting the two plates to the pattern in the drawing, I was able to fit in easily the drive screw and the tension spring. I am sure it can be made even neater.

This particular version is designed to be bolted to the top of a solid tripod, but there is no reason why the Haig idea of a table top base made from a solid block of wood should be ignored. This version will not give longer exposures than the classic Haig Mount since it uses the same short screw, but it is very stable indeed with the weight bearing down on the surfaces and the centre of gravity, and there is little worry about the turning surfaces going out of alignment. It will certainly be easier to mount a polar alignment telescope, perhaps even through the middle of the polar axis if this is made hollow.



Back in 1983 I used my first "Scotch Mount" to photograph Comet IRAS-Araki-Alcock. I got a nice photo but it showed some drive errors which troubled me and set me thinking.

I made my "slider" in one afternoon at a rate of knots, because the sky that day was perfect and Hale-Bopp was to be at its best that night. It was in position by nightfall, but ironically the skylighting was so bright that exposures longer than 10 seconds were impossible, and no drive unit was required



Both cameras are pointing towards the Celestial Equator

George Haig wrote a paper in the "School Science Review" September 1974 describing his methods of astrophotography for physics students, and this seems to be where the "Scotch Mount" first appeared. When I spoke to him years later when the term was on everyone's lips, he was amazed, he had no idea that this was now its name worldwide, or that this gadget might be considered another landmark Scottish invention. In this paper, and in a J.B.A.A. paper, George Haig also describes how the stars can be made to "trail" slightly for spectroscopic photography by putting the drive screw in at say 95% of the calculated distance from the pivot. Truly a masterpiece of simplified engineering, but of course it does come from a master.

Harry Ford

The Scottish Astronomy Weekend 1999

The annual Scottish Astronomy Weekend was held at Belmont Hall of Dundee University on September 10-12. Although it was the 13th such event the Fates were kind and it all went very well. Dundee has become the favourite venue for a number of reasons - Belmont Hall offers a superior level of facilities and catering, the city has much to offer in visitor attractions and of course there is the unique Mills Observatory. This year it was almost an Edinburgh Weekend: our 16 ASE members out of a total complement of 50 outnumbered those from all the other Scottish societies put together. Even Dundee itself was not well represented, and there were only two people from the west of Scotland. It is not a healthy situation and does not augur well for future events.

Dr Andrew Collier Cameron, senior lecturer at the University of St Andrews, described the search for planets going round some of the nearer stars, by the detection of small Doppler shifts in their spectra. His animated computer graphics were much admired. This was followed by a pleasant evening reception at the Mills Observatory, laid on by the Friends of the Observatory, and some viewing was possible in a reasonable sky with the 10-inch Cooke refractor. Sadly, this was Brian Kelly's last official duty there as City Astronomer, he is moving on to a new career and we wish him well.

Saturday had talks by Ron Livesey on the nature of lunar soil, Brian Kelly on the forthcoming, and *possible* Leonid meteor storm, Dr Michael Gadsden on the detection of Noctilucent and Polar Mesosphere clouds by the examination of the sections of atmosphere around the Earth's limb, as imaged by meteorological satellites, and Graham Rule spoke on Astronomy on the Internet. The staff at Belmont Hall obligingly helped Graham to set up a telephone link from their office to the lecture room so he was able to call up his own computer in Edinburgh and display, with the projection system, examples from the vast range of data, amateur and professional, available on the Web.

In the afternoon some went off to explore the shops, museums or historic ships in the city while others went on a pleasant bus trip to Glamis Castle. Besides the tour of the sumptuous interior (but why do the so-called Ruling Classes have this obsession with killing animals?) the group had arranged to examine the magnificent polyhedral sundial in the grounds. This was made about 1670 and has 84 faces showing the time in various parts of the world. Too bad the sun didn't shine for us. Among our delegates were a few members of the British Association of Planetaria, who held a business meeting while the rest of us were on tour. In the evening our main guest speaker, Storm Dunlop, gave a very full and interesting account of the nature of variable stars and how amateurs can do useful work on them.

Sunday morning's session began with Dr Dave Gavine on the life and work of James Nasmyth then Jamie Shepherd spoke briefly on the nature of meteorites and invited the audience to handle specimens and study thin sections from his own extensive collection. A coffee break was followed by the final Members' Session, short contributions from the audience. Dr Sandy Mackenzie

showed his latest astrophotography successes, Tony Hopwood described the "shock wave" effect detected by his particle collectors during the solar eclipse and New Moons, and the total eclipse chasers Iain Scott, Graham Young and Dr John Rostron described their adventures, successful and unsuccessful. Iain's slides of the totality from Bulgaria were particularly striking.

It is not yet certain where and when the next Scottish Weekend will be. Ayr has been suggested as a possible venue but we will let you know in good time.

Dave Gavine
(organiser on behalf of SAG)



Scottish Astronomy Weekend delegates at the Renaissance Sundial at Glamis Castle. They include (L-R) Adrea and Iain Scott, Dave Gavine, John Rostron, Alan Ellis, Maurice Frank, Ron Livesey and Jim Kidd. Storm Dunlop is on the right of the back row. Lorna McCalman took the photo.

Leonids 1999

The Leonid meteor shower occurs every year between the 15th/20th November and is the result of the Earth passing through the trail of debris laid down by comet Temple Tuttle, the parent comet of the Leonids. Each time the comet passes near to the sun it lays down more debris for the Earth to encounter. The orbital period of comet Temple Tuttle is 33.2 years and it was last at perihelion early in 1998. A normal Leonid meteor shower would typically produce tens of meteors per hour, but roughly every 33 years there is a period of very high activity producing a meteor storm with rates of around 100,000 per hour. The last meteor storm occurred in the USA in 1966 so the 1999 Leonids were eagerly awaited. However, simply adding 33 years to the date of the last period of high activity has been shown not to be reliable and this is in no small way due to the deviant effect of the gravitational attraction on the comet's orbit by the large planets in the Solar System such as Jupiter, Saturn and Uranus.

In accordance with good observational practice, we kept checking the sky on the night before the predicted maximum which was anticipated to be the 17/18th November. The Leonids caught many people out in 1998 by peaking on the 16/17th November, but this year there was no indication of an early peak. Of course you should watch for activity after the predicted maximum too.

Despite the forecast which predicted a widespread frost with northerly winds over much of the country, the 17/18th November was almost totally cloudy with the exception of the vital time. The maximum of the Leonids was estimated to be around 02.00, at which time, the clouds dispersed leaving a 41 minute window of observation. The Moon was not going to be a problem, having set at 00.40hrs. Because of the unfavourable weather elsewhere, Edinburgh was one of the very few places in the United Kingdom to see the Leonid shower of 1999. Lorna, Douglas and Jenni McCalman from Hillside Crescent Edinburgh at 02.10 hrs. The limiting magnitude was 4.4 estimated by using the north polar sequence as described in Neil Bone's book "The Observer's Handbook - Meteors" published by Philips. (This book is currently in our library and is a very helpful guide to the beginner and the experienced observer alike and gives lots of useful information. Why not check it out before the Geminids in December?)

Our city, north facing garden was an unfavourable observing site because of light pollution from surrounding buildings which also restricted the angle of view up to 20 degrees at our imposed horizon, 1/4 of the celestial sphere. Our field of view covered Ursa Major in the east (we could not see the radiant point in Leo), a small part of Auriga overhead, Cassiopeia in the west but very little to the north beyond Ursa Minor.

The meteors came thick and fast and it became an exercise in simply keeping count. We counted 74 meteors in the first 15 minutes and 57 in the next 25 minutes. During the observing time of 41 minutes we counted 131 meteors. Of all the meteors observed, only one was sporadic. One fireball was seen in Perseus at 02.37hrs heading almost due north magnitude -4. with a thick train lasting for 1 second. At least half of the meteors were very bright, magnitude -1 to -2. These were fast moving with trains, but none of the trains was persistent as had been the case in 1998. (Many of the 1998 Leonids were fireballs with spectacular trains.) The remainder of the meteors were around magnitude +2 to +3, fast, faint and many with trains. Most of the meteors were seen in Ursa Major, Ursa Minor or overhead in Auriga, but this could be accounted for by our view restricted to the north only. At 02.40hrs we had 80% thick cloud cover through which we saw a very bright flash probably in Ursa Major, but we were unable to see the meteor. Clouds clearing at 03.55hrs showed that the meteor rate had significantly dropped and the next 10 minutes resulted in observing only 4 Leonids.

We were not the only ones to be frustrated by the clouds. Patrick Moore, on the BBC's News 24, suffered a re-run of his live TV, "cloudy eclipse commentary", only this time it was live TV, "cloudy Leonid coverage". Never mind, according to Rob McNaught, all is not lost. Rob has

been working on the mathematical analysis of the orbit of comet Temple Tuttle and he thinks that there is a good chance of a Leonid meteor storm in 2001. For more information check the website of the Astronomical Society of Australia at http://www.atnf.csiro.au/asa_www/leonids.html.

Lorna McCalman

Other Observations

Graham Rule went up to the Calton Hill around 1am on the night of November 17th/18th to enjoy the spectacle among a small crowd of people - some of whom had seen an article in the Evening News about the Leonids with the title "Asteroid shower to entertain stargazers". (Graham insists that he did not promise the reporter an 'asteroid shower'.) Although the clouds cleared for the peak of the shower there was still a lot of haze and sky-glow - which he uses as an excuse for not recording any proper observations. He does report peaks of 3 or 4 meteors a minute (many of negative magnitudes, some with trails) and a very enjoyable period 'shooting-star-gazing'.

Will Joy, Alison Duncan and Dave Gavine saw only a few Leonids from Joppa on the night of Nov 16/17, then on the following night, the maximum, they managed just over an hour in a poor sky with limiting magnitude 4 and no better than 4/8 cloud. 136 Leonids and 2 sporadics were seen, but apart from one huge flash within the clouds the general magnitudes of the meteors were fainter than those of the rich shower of Nov 16/17 last year. Other observers had similar fortunes.

Faint auroral light was seen by Dave Gavine at Joppa on Aug 22/23, Oct 10/11, 11/12, and Nov 8/9. Ron Livesey saw auroral light at Inveraray on Nov 13/14. There has been some magnetic activity, which infuriatingly nearly always coincides with overcast conditions, and as the sun is becoming very active, a big auroral display is long overdue. So watch the northern sky on every possible occasion.

Lorna. Ron and Dave continue to monitor variable stars. R Coronae faded in the autumn but it is now becoming too low in the west for us to check.

Dave Gavine

Popular Astronomy Class

Dave Gavine will be teaching an evening class in Popular Astronomy commencing on Monday 11th January. Each of the 8 classes are on Monday from 6:30pm until 9pm at the Jewel & Esk Valley College in Milton Road. For further details please contact Dave (0131 657 2338) or the college (661 1010). The fee for the class will be £38 (although there may be concessions available). Please note that enrollment **before** the first meeting of the class is encouraged.

The Solar Eclipse of August 11 1999

First, an account by someone who *did* see the totality:

"The Great Hungarian Eclipse"

It was 1967 when I first heard about eclipses, in particular the one due in 1999. Since then I have seen many lunar and partial solar events but I decided to wait until 1999 to see my first total solar eclipse. Originally I thought about Cornwall, but "Providence" (to quote a letter to me from Mrs Jeanette McDonald Noble of Carnoustie on the eve of the expedition) took me to Hungary for after all this was a land in which I had planted seed, so to speak. My son, Marci Ewan (surnames first in Hungarian) lives with his mother in the centre of Hungary just north of Kecskemét, inside the band of totality. I had, on the other hand, decided it would be best to get into the centre of the shadow zone to take advantage of a maximum duration of 2 mins 21 secs. Not far away in Romania was the point of maximum eclipse of 2 mins 23 secs so I decided to go to Szeged near the Romanian-Serbian border. Helping with this was my friend from Miskolc, Padi Ferenc (Feri) and his pal Radnai Gábor (Gabi) came along too. We joined a party from Miskolc led by Baksa László (Laci). I was the only foreigner but felt more Magyar than Scottish. Also I was the only amateur astronomer in the group with set intentions. My priorities were to photograph the partial phases and vary exposures during totality with a telephoto for the prominences, corona and perhaps any earthshine on the Moon. With a standard lens on another camera I would try to capture the planets and the Moon's shadow two cameras, two tripods and a 550 mm Maksutov with a "14" welding glass; and Mylar glasses for Feri and Gabi. Feri videoed the event with a camcorder and Gabi took photos with a hand-held 35 mm lens. Laci observed the event with naked eye during totality.

The eclipse was unique in that, not only was it the last of the Millenium, but it crossed over so much land and was accessible to a very large proportion of the world's population. It was to become a unifying force. The totality track first brushed the Earth at sunrise in the Atlantic south of Nova Scotia, first touched land at the Scilly Isles, then over Cornwall, Devon, Alderney (the only Channel Isle), France (just missing Paris), Belgium, Luxembourg, Germany (right over Stuttgart where it was rained off), Austria, NE Slovenia, Hungary, Serbia, Transylvania, Romania, Bulgaria, The Black Sea, Turkey, Kurdistan, Syria, Iraq, Iran, Pakistan and India, skipping off the world in the Bay of Bengal. Parts of USA and Canada, and SE Asia would see a partial, as would the whole of Europe, the Middle East, N. Africa and Central Asia as far as Mongolia and part of China. It was 80% in Dundee, as it had been at the 1954 eclipse.

The night before the eclipse the four of us had a few beers in Szeged. The atmosphere was great, with live music. We all "crashed out" in the hostel. I woke briefly at 6-30 AM with the sun shining through the window. 'Great', I thought. Half an hour later I woke up again to the sound of thunder the sun had become watery. We went to breakfast at 9 AM in pouring rain with lightning flashes. I was still optimistic because I knew these kind of storms in Hungary only last 2-3 hours at that time of year and there was a good wind from the west. I took photos of the grey clouds and noted the time - 11-30 EST (9-30 UT), the eclipse hasn't reached Cornwall yet. I hoped everyone I knew across Europe would see it even if we didn't. In late morning the euphoria began, we decided to walk through the city centre to a site beside the river. A bridge was packed with locals holding Mylar specs and the atmosphere was both electric and optimistic (typical of Hungarians) with music booming. A watery sun appeared then a blue patch in the west - at least we'll see something. I had resigned myself to total darkness under the clouds. I checked my watch - 12-12 (11-12 BST) total in Cornwall, I thought about Dave Gavine, Patrick Moore and the BAA crowd. 12-20 EST I hope Brian Kelly has got it in France. 12-34 EST Stuttgart - John Burgess of Dundee AS, Alex, Harry and Tony Higgins of Leeds AS and my German friends Winfried and Roland. 12-44 EST it must be in Austria - Fiona and Roger from St Andrews?

It entered Hungary at Szombathely and got to Balaton by 12-50 where an estimated 400,000 had congregated. We were seeing the partial phase going in and out of clouds - I was managing to photograph with the telephoto. Soon we were in the last four minutes - a thin sliver of light, still dangerous to view direct. When will we see the Moon's shadow? One minute - decided to remove the filter to prepare for totality. We were lucky - only high cirrus. Feri began to video the western sky for the shadow. It came. Already it was very dark. Cheers erupted from the bridge. The sliver was now a string of beads, a shiny chain of pearls, easily seen, no proper Diamond Ring effect but saw a golden-red flash of the chromosphere. Suddenly the whole brilliant inner corona appeared and I realised this was IT totality! I saw prominences around the sun and a depressed, round, bright corona, confirming the high solar activity. I made various exposures with the 550 mm telephoto then moved on to the other camera for wide-angle shots - saw Venus but not Mercury, too much cloud in the wrong place. It was very cool, a dramatic temperature drop - I wasn't sure whether my hair standing on end was the cold or psychological. Music was blaring in the distance, traffic had stopped. I had time to simply observe through the telephoto it was unreal, I couldn't believe it.

I originally intended to go for at least a 20 second exposure of the totality with the telephoto to try for earthshine but I knew this would be impossible due to the high cloud. The moving clouds gave the effect of shimmering across the corona. It was a pity it was not completely clear because perhaps this was a good opportunity with such a depressed corona to have been able to record the earthshine on the Moon, but then again I took comfort in the thought that the corona was as bright as the full Moon. I could not see the earthshine on the lunar surface at all - the sky was not dark enough, the contrast was too low. Time was passing so quickly I did not look for other stars, and Jupiter and Saturn would probably have set, and Mars was not up yet. Suddenly it was daylight on the clouds in the west, the Diamond Ring appeared and totality was over. Feri risked continuing filming directly at the sun just after totality to see the effect and later we found it had worked. I had to replace the filter on the telephoto and point the other camera to the east to try for the receding shadow. I took some photos of the partial phase, it was getting warmer, time to pack up. It was now 13-30. total in Turkey. Time to celebrate, but it took a while to sink in on how lucky we had been. We could not find a place to eat at first because everywhere was full of celebrating people. Crescents appeared under the trees but because of the cloud it was not possible to see shadow bands. But at least the clouds helped to identify the lunar shadow moving in and receding. From Szeged totality lasted from 12-53 & 22 secs EST to 12-55 & 43 secs, and 1st contact was at 11-30, last (4th) at 14-17. The sun was at about altitude 59 degrees. Then we had a meal and the best couple of beers in a long time. Contentment on the long bus trip back north to Miskolc and during my last full day there, the train back to Budapest, the flight to London and the overnight coach to Dundee. The future had now become the past. Providence.

Graham Young, Dundee Astronomical Society

Gerry Taylor in Devon was not so lucky

We are often exhorted to use public transport, and for a journey down to the south-west of England I should certainly have preferred to go by train, or even bus, rather than drive for something like 10 hours. Unfortunately I could not book a bus at all; and though a place on a train to Exeter on the Sunday before the eclipse was available, the railway staff were vague about when I might be able to get back, other than to say it would not be before the following weekend. And when I mentioned taking a bicycle along, to provide mobility at journey's end, they lost interest altogether. So it had to be the car. I left Edinburgh on Sunday morning and

had an almost unhindered drive, apart from a delay due to sheer number of cars near Birmingham. At a service station on the M5 I encountered John Rostron.

The general attitude was that the total eclipse was a Cornish happening, but a part of east Devon extended almost down to the centre line. It would experience a briefer totality than the best sites in Cornwall, but have more chance of clear sky if the weather should be unsettled on The Day. On the nights of Sunday and Monday I stayed a few miles south of Exeter, where the weather men forecast at the weekend a 60% chance of seeing the eclipse. But as Wednesday approached their prognostications grew gloomier and more definite: it sounded like an auction in reverse, the likelihood of standing in unobscured lunar shadow falling to 15% by Tuesday. It was added that the south-east part of Devon had the best chance of seeing totality. This may have influenced a lot of eclipse seekers, or perhaps a last-minute rush would have happened regardless. Anyway, my Tuesday trip to the south tip of Devon, though not great in miles, was long in hours, and I reached Salcombe to find there was nowhere to stay, either there or anywhere else nearer than where I had started from that morning.

Dawn on Wednesday was cloudless, but trouble was on its way from the west, and at Falmouth it was reported to be already raining. Would the weather hold till at least 11:15? As the morning went on clouds formed, congregated, and thickened. They were like the oysters in Through the Looking Glass:

And thick and fast they came at last,
And more, and more, and more.

From near Dartmouth a nibbled sun briefly found a clear space to shine out of. When it was nearly 11 o'clock a severely bitten sun showed a watery crescent through a less obliterating patch in the overcast. But all the time the weather was worsening, and the clouds loomed the more for the weakening of the sun's light. I pulled my car off the road near a farm gate. The few other occupants of the site, having heard that animals might behave oddly, noted that birds were still aloft, and one or two people wandered off to inspect the farmer's sheep. In the west a yellow glow, like a late reminder of sunset, gilded a thin strip of sky a few degrees wide near the horizon, and in the seconds before the unseen totality daylight faded as if someone was turning a dimmer switch. It was easy to imagine that in olden times such an occurrence would have caused consternation. As it was a disembodied cheer went up that showed my vicinity to be more thickly populated than I had supposed. Fireworks could be heard nearby, and seen in the distance.

A total eclipse does not produce anything like the darkness of night: only the brighter stars are said to become visible, but the sky gives an impression of near blackness because the eyes do not adjust quickly enough to the sun's disappearance. Eclipses are also said to vary in how dark they are. This one did not seem particularly dark, and my impression, possibly wrong, is that I could have read during totality.

To be thwarted by the weather was disappointing, but I did have an opportunity of exploring a part of Britain I had never before seen. A highlight was a visit to the village of Spreyton. A sign at the tavern there tells that Uncle Tom Cobley, together with the other gentlemen commemorated in song, thence rode the hapless mare to Widecombe on a day in September 1802. This was a considerable achievement, since Tom Cobley was buried in the nearby churchyard in 1794. A lowlight, so to speak, in my tour of Devon followed a wrong turning I took through being reluctant to get my map out in pouring rain. The consequence was an unscheduled ride on a road climbing over 1000 feet in about 3 miles to the roof of Dartmoor. Still, with exercising as with eating, the less you enjoy it the more good it does you. And the view was good.

Gerry Taylor

Some went to Cornwall ...

Dave Gavine,
Maurice Frank,
Debbie Geddes,
Kenny Laidlaw,
Bill Ward,
Vincent Balfour,
Jamie Shepherd,
Dorothy Mackie
and her family all
went to Cornwall.
Those on the
SRPS train (a
sleepless 13-
hour journey and
the same back)
were elated as
they crossed
Devon in the
early morning - a
fine starry sky
with Jupiter, but
alas, at
Penzance a



Maurice, Dave, kenny and friends in the dark at Truro, but no sun

golden dawn was quickly followed by clouds moving in from the west. Some of us headed back to Truro where the sky was better but the clouds soon followed. A brief glimpse of the thin crescent sun before and after was all we got - and the eerie dark greenish blue of the clouds as the daylight was turned off as if by a dimmer switch. Street lights came on and the seagulls went berserk, then up went the daylight again about a minute later. Still, Truro is a fine small city to explore, even in the rain, with a fine cathedral, decent cafes and lots of interesting shops.

Dave Gavine

... described graphically by Maurice Frank ...

Just before dawn entering Cornwall, there was enough clear sky at higher altitudes to see the whole of Auriga. Those billows of cloud do spring on you out of nowhere. We should all evolve into Arctic terns, they can go anywhere, they're at the peak of evolution, not us. All an ape could do was anxiously scan the radio, but at 9:40, with 20 minutes to spare to go there, news of the pessimistic mood at Falmouth with a thick roll of cloud heading for them decided me to stay in Truro which seemed to have the least bad prospects but still a total cover of light billowing cloud.

With 4 ASE folk and a few others in a low lying piece of park by Mon Quay, centre of town but well shielded from lights. We went through torment, sinking into even sticking up a paper cutout (from a newspaper) "consolation eclipse, and giving a mopey interview of the defeated to a radio reporter. [we never heard it - Ed]. I'm glad not to have been part of that: never give in even when you've given up.

A break showed us the crescent sun in its extreme partial phase. In the event it lasted for several seconds. In a couple of minutes it was repeated. Twice the cloud was just right to filter out the sun's brightness to show us this wonder, safe to look at directly. The moon appeared

slightly brown, not outshone, I don't think this was an optical trick, even if there's nothing except Earthshine it could have appeared by. What a contradictory thing to say you've seen the New Moon. The radio played "Moonlight Shadow . We wanted to be there.

The curious electric silence grows on you. A dark stormy look brewed on the western horizon, before sweeping over our heads in a spilt blueberry pie effect as its deep colour imprinted on successive cloud billows. There was some red in its folds, but dark blue like a moonlit night dominated. It wasn't completely dark : it was enough to set off a big flock of birds from a nearby tree, to fly out squawking in loud confusion above us. Really ominous all those things they write about the unreality are true. Knowing where the sun was, we could see a patch of white light there, whiter than the cloud cover. We called to each other as every thinning crossed it, I saw at least 2 split-second beams of a pure white pierce through. We must have had over a minute of totality gone when there was a decent patch of thinned cloud to the sun's lower right. A brightening of the white light came with a streaming effect in the 5 o'clock direction, all aligned that way. A flaring structure was apparent for only perhaps 3 seconds, that was as much as we saw of the corona.

The watching for breaks had thrown my sense of time, it was unbelievably dismaying how soon light was announced to the west. A point gleam of sun switched on through the occlusion as abruptly as a light switch, in the same instant as the wonderful darkscape dissolved off the land into too sudden normality. The last shafts of the hand from another world rolled off the eastern sky like peach peel. We'd been there. We got treated to a third good look at the crescent sun, but half an hour after totality solid cloud and rain set in.

Maurice Frank

... while others stayed at home

On the day of the eclipse Edinburgh saw a hazy sky, but one in which the sun could be seen. I went up to open the Observatory just in case we had some visitors and right from the start of the partial eclipse there was a steady stream of people coming in to have a look at the projected image of the Sun. The 6" Cooke was particularly popular although we showed how to observe safely by projecting through smaller telescopes, and even cheap binoculars.

We also gave safety advice to visitors. Johnnie Bradley had brought some welder's glass which came in useful and we had some spare sets of 'Eclipse Spectacles' which we could allow people to use.

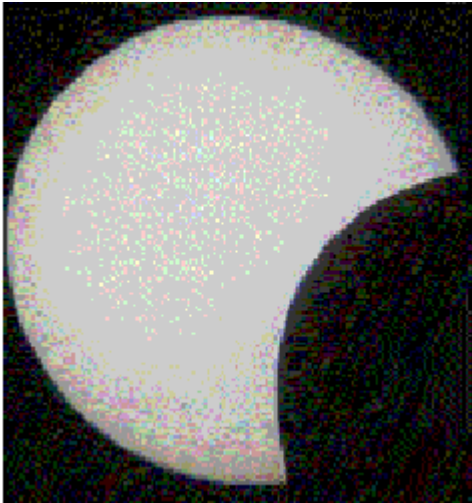
At the maximum eclipse it got noticeably colder and there was a strange feeling, as though a great storm was about to break. Even the sound of drums from some group outside on the hill was stilled at this time.

Given the reports of bad weather elsewhere we seem to have been very lucky in Edinburgh - if only it has been a total eclipse here! Well, I suppose I'll have to save up for a trip to Madagascar...

Graham Rule



Projecting from a small telescope outside the observatory



**Partial Eclipse as seen at the
Cooke Telescope**



Appreciative visitors at the City Observatory

James Melvill sees a great Comet in 1577

"This yeir, in the winter, appeired a terrible Comet, the stern [star, i.e. nucleus] wharof was verie grait, and proceeding from it toward the east a lang teall, in appeirance, of an ell and a halff, like unto a bissom or scurge maid of wands all fyrre. It rease nightlie in the south weast, nocht above a degree and an halff ascending above the horizon, and continowed about a sax oukes [weeks], or twa moneth, and piece and piece weir away. The graitest effects wharof that out of our cuntry we hard was a grait and mightie battell in Barbaria in Afric, wharin thrie kings war slean, with a hudge multitud of peiple. And within the cuntry, the chasing away of the Hamiltones.

James Melvill (1556-1614) was educated at the University of St Andrews during the turmoil of the Reformation and when John Knox lived there. He became a Regent then Professor of Hebrew and Oriental Languages, in 1586 he was Minister of Anstruther then in 1590 Minister of Kilrenny, Fife. This, and his accounts of a total eclipse of the sun (ASE Journal 25) and of a fireball (ibid. 39) are from his *Autobiography and Diary*, Wodrow Society, Edinburgh 1842. p.45.

The celebrated Comet of 1577 was observed by Chinese and Japanese astronomers. Tycho Brahe first saw it while out fishing on November 13. European observers watched it until late January. It moved from Scorpius into Aquila and Pegasus, its blue-white nucleus was said to have been brighter than Venus, or as bright as the Moon, and its tail, estimated from 22 to 60 degrees in length, was quoted as white or reddish. Tycho found no perceptible parallax so concluded that it must be further away than the Moon, moving retrograde at an angle of 29° to the ecliptic and within the "sphere" of Venus. (Tycho did not agree with either the Ptolemaic or Copernican models of the cosmos - in his own system Venus and Mercury went round the Sun but the Sun went round the Earth.). In his later work *De mundi aetherei recentioribus phaenomenis* (1588) he used the evidence of the comet and of the supernova he saw in Cassiopeia in 1572 to confound Aristotle's notions that the heavens are unchanging so transient phenomena are in the upper air, and that the planets move in crystal spheres.

Dave Gavine

Book Review

The Young Astronomer by Harry Ford

Covent Garden Books (Dorling Kindersley Ltd) London 1999. 38 pp. hardback A4, £8.99.

This book is designed to introduce young people to the delights of astronomy by giving readers practical projects to do. These range from making simple observations and recording the results to demonstrating the expansion of the universe by blowing up a balloon. Other experiments, for example, show the reason for varying brightness in occulting variable stars, how comets grow tails and why the shape of the planet Jupiter is ellipsoidal due to its speed of rotation.

The Sun, Moon and planets are individually described together with sections on comets, meteors, stars and galaxies. There are hints on how to observe sunspots safely and what to look for on the surface of the Moon. There are tables giving some details of planets, stars, meteor showers and galaxies.

The book is beautifully produced with coloured pictures and diagrams. The text is easy to read and for each experiment there is a list of materials required for its completion. An index of contents and a list of useful addresses are included.

Harry Ford has spent a lifetime teaching astronomy to people of all ages and firing them with his enthusiasm for the subject. I recommend this volume as a Christmas present for any girl or boy who has looked not once, but twice, at the night sky and asked "What is a star?"

Ron Livesey

Scottish Astronomers' Group

The SAG met in Stirling on Saturday 27th November and was well attended by representatives of astronomical societies from around Scotland (and beyond).

The first talk was by Bill Ward (who spoke to our Society recently) on "Mr Schmidt and His Wonderful Telescope". This was a most interesting introduction to the optics of the Schmidt Telescope which is capable of taking wide-field photographs and has been described as being as great a development as the telescope itself. Bill showed us photographs of some of the large Schmidt telescopes that he has used around the world. We also heard a bit about the rather eccentric Mr Schmidt himself. I have asked Bill if he might be able to give his talk to the ASE at some time so I won't go into more detail here.

The second talk was by Rob McNaught on "The Dust Trail Theory of Leonid Meteors". Rob is a professional astronomer from Scotland who now works in Australia carrying out sky surveys - he might help us avoid an 'Armageddon' situation if he finds an incoming asteroid early enough. His talk gave a clear explanation (without maths!) on how the orbits of dust thrown out of comet P/Tempel-Tuttle have joined the comet in orbit around the Sun. When the earth passes through these sheets of dust we see meteor storms. He explained the development of the model to a stage where it can show where these dust particles are in space and how this can be matched up in detail with historical Leonid storms. It is even possible to predict these

storms to within a few minutes - so accurately that different parts of the world see the peak at different times!

Following a tea break I'm sure I wasn't the only one there who was happy that the main business of the SAG's AGM was cut short to allow Rob to continue with some photographs, videos and recordings of his observing session on the night of this year's Leonid storm. He was in a slightly better observing site than most of us in that he was in the desert of Jordan following an international conference on meteor astronomy.

Other observing reports were given by members including some good photographs and videos of August's eclipse. There was a short discussion about the Scottish Astronomy Weekend and the finances of the SAG.

Membership of the SAG is open to anyone interested and as it is only £5 each year it is well worth it. But as the ASE is a group member of the SAG we have it's "SAGMag" in the library and any ASE member (not just Council members) may attend the meetings. They are well worth going to as the standard of talks is always very good and it is interesting to meet with other amateur astronomers from around the country. The next meeting will be held at the City Observatory in May (probably on Saturday 20th) and more details will be announced at a meeting nearer then.

Graham Rule
