ORWELL ASTRONOMICAL SOCIETY (IPSWICH)

O.A.S.I.

-: JUNE 1986 :-

SOCIETY NEWS

1. Lecture on travelling to Australia to observe Halley's Comet

Roy Cheesman and Alan Smith will be giving a report on their recent trip to Australia to observe Halley's Comet. The meeting will be in the library at the Friends' Meeting House, Fonnereau Road on Friday 20th June between 7.30 to 10.00 p.m.

2. Open Weekend

The observatory will be open to the public for our annual fund raising event on the four nights of September 19th, 20th 21st and 22nd.

3. Committee Meeting

The next committee meeting will be in the club room on Saturday 5th July from 7.30 p.m. Open to all members.

NIGHT SKY

Constellations (all times G.M.T.)

The constellations of Lyra, Hercules, Aquila and Cygnus are in the southerly part of the sky at midnight in mid month.

Sun Rises at about 03.40
Sets at about 20.20

Moon  7th  15th  22nd  29th

Occultations

19th	ZC 2227	mag.	5.8	D	23hr.5.3m
19th	" 2235	"	6.2	D	23hr.43.9m

Mercury Greatest eastern elongation on the 25th (25°) and sets about an hour and a half after the sun. Mag. 0.5

Venus Sets at about 23.00 Mag. 4.0

Mars Rises between 23.20 to 21.30 during the month Mag. -2.1

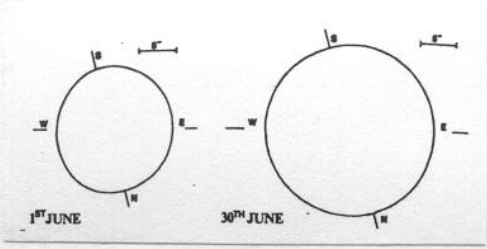
Jupiter Rising changes between 01.10 to 23.20 during month Mag. -2.4

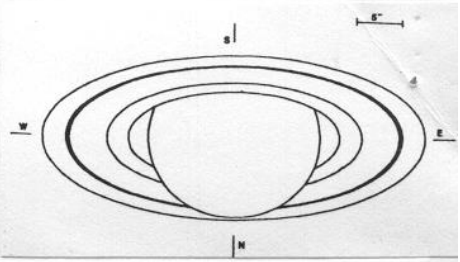
Saturn Rises before sunset. Mag.0.1

Uranus Rises at about sunset. Mag. 5.8

Neptune Rises at about sunset. Mag. 7.7

R. Gooding





Mars, approaching opposition on 10th July, increases in size this month to over 20 seconds of arc and it's phase becomes nearly full. N & S refer to the poles of the planet; E & W refer to it's motion across the sky.
Saturn, drawn here at a slightly larger scale, has it's rings tilted 25^{o} to the Earth throughout the month.

ASTRONOMICAL TERMS

E SIMS

PERIHELION

Perihelion is the point when an orbiting body makes its closest approach to the Sun
In the case of the Earth this point is reached on January 1st each year.

APHELION

Aphelion is the point at which an orbiting body is at its greatest distance from the Sun.
For the Earth this is 6 Monthes after Perihelion.

FIREBALL

A Fireball is an extremely bright Meteor which leaves a bright trail in the night sky that can last for several seconds and can be as bright or even brighter than the Moon.

METEOR

A Meteor is seen as a streak of light in the sky which only lasts for a few seconds.
Meteors are caused by tiny particles of dust or debris from old comets entering the atmosphere at very high speed and burning up.

METEORITE

A Meteorite is a solid lump of matter which has survived passage through the atmosphere and reached ground level. While passing through the atmosphere the outer layer of a Meteorite becomes intensely heated and melts and streams away and may be seen as a brilliant trail of light, also fragments may be seen to break away from the main body.

HALLEY FROM DOWN UNDER!

A J Smith

On the 3rd April 1986 two members of the OASI set off on what must be the most ambitious field trip undertaken by the Society. Roy Cheesman and myself left Gatwick after travelling through sub zero temperatures and a blizzard to observe Halley's Comet from the Southern Hemisphere. Thirty six hours later we landed in record April temperatures at Sydney Airport to start an observing session that had been planned for 2.5 years. By carefull planning? we had managed to get a window seat on the Boeing 747 that would enable us to get our first glimpse of the Comet at 39,000ft just outside the airport of Abu dhabi, the second of many stops (on what seemed to be a world tour) on route to Australia.

After extricating ourselves from the clutches of Australian Immigration officers (Roy seemed particularly attractive to close scrutiny) we boarded a coach for the short journey to our hotel. Here we would spend a night preparing to cross, overland, the whole continent from Sydney in the East, via Port Augusta in the South, to Darwin at the "top end".

My first problem was to find a source of 24v power to enable me to charge (and recharge frequently) the power supply of the electrically driven equatorial mount that had caused so many headaches (and strange looks from custom officials). After some negotiations with the coach driver and some dismantling of various parts of the coach, a permanent, switched supply was provided on the dashboard of the driver's pride and joy.

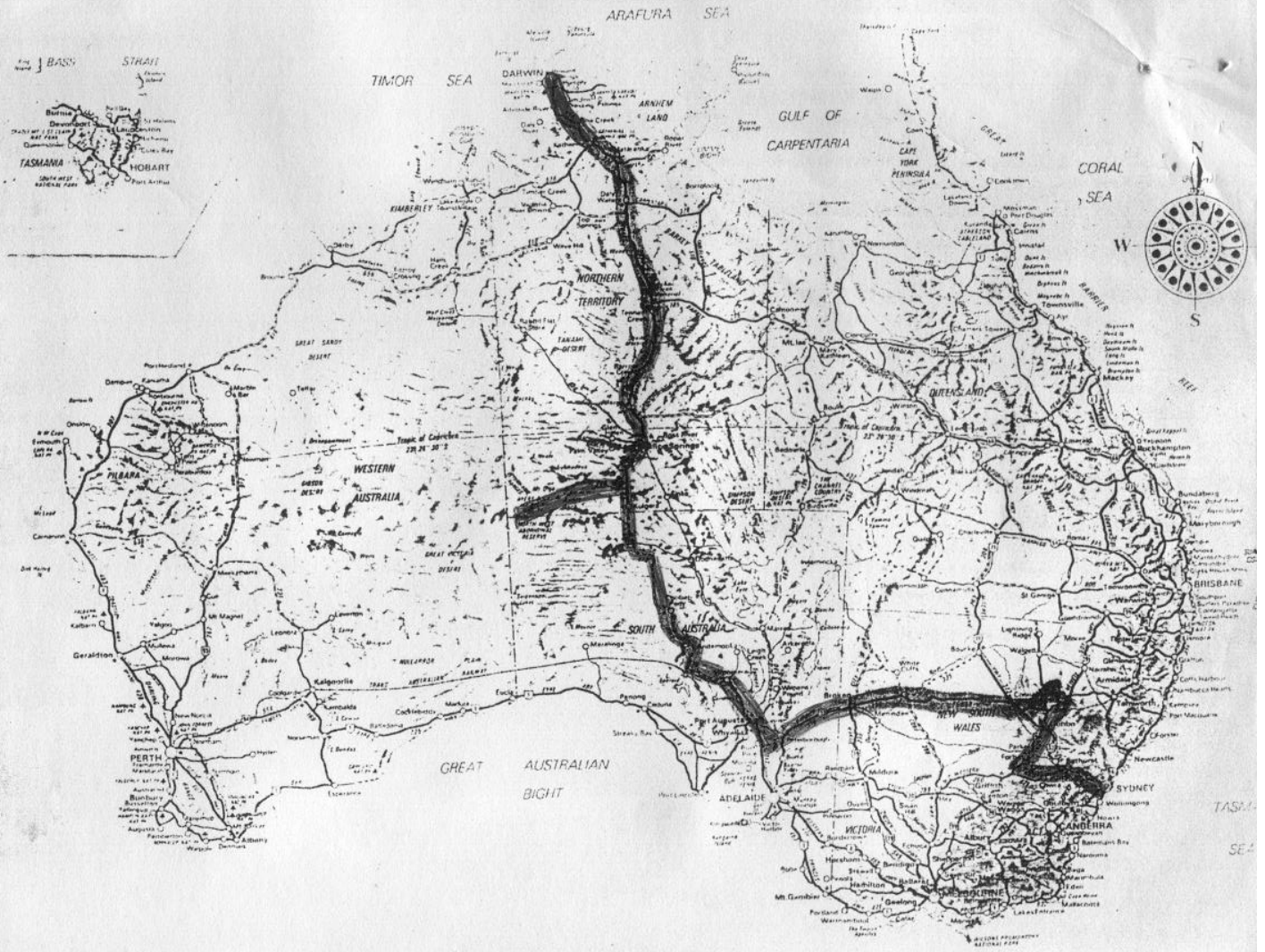
The first night provided us with our taste of things to come, with the magnificent southern sky being eagerly scanned between the clouds (the only ones we saw for three weeks!). The first day of the trip was spent in touring Sydney Harbour by boat followed by the drive to Dubbo, a small town near Parkes Radio Observatory (the radio telescope used to chart GIOTTO's progress a couple of weeks previously). That first day proved to be only the first of a succession of superlative sights, the conducted tour of Parkes Observatory, the fantastic scenery of the Warnimbungle National Park, Siding Springs Anglo Australian Telescope,Woomera Rocket Range, Coober Pedy opal mining town (where EVERYTHING happens underground, including the camping!) Ayers Rock, Henbury meteor craters, Alice Springs, Katherine Gorge and Darwin being only a selection of memories.

The Southern Skies can only be described as magnificent, the stars could be seen from horison to horison with easily recognisible constellations such as Orion and the plough (behaving somewhat oddly, upside down and going backwards) being lost in the rich starfields of the Milky Way and Megellanic Clouds.

What about the Comet, I hear you say. Well as in the northern sky it was somewhat less than spectacular to the naked eye, with only a 5 degree tail being visible, but using telescopes and binoculars the tail could be seen to perform various complex manoeuvres from night to night.

Other sights, such as most of the planets ,the Zodiacal Light and a partial eclipse of the Sun, gave us nights that matched the days in splendour. Our last veiw of the Comet was probably the most bizarre, laying in a swimming pool at 7 oclock in the evening, with tropical palms waving overhead, night time temperatures of 85 degrees plus and a cool glass of Orange? to complete the tour.

We brought back with us nearly 1000 slides and memories that will last a lifetime, obviously too much to put into a short article for the Society Journal, so a slide show and talk will be held at the Friends Meeting House on June 20th where hopefully we will be able to share some of the sights of Australia and show some spectacular slides of the Heavens.


ARAFURA SEA
TIMOR SEA
BASS STRAIT
TASMANIA
Burnie
Devonport
Launceston
HOBART
DARWIN
ARNHEM LAND
GULF OF CARPENTARIA
CAPE YORK PENINSULA
CORAL SEA
KIMBERLEY
NORTHERN TERRITORY
GREAT SANDY DESERT
TANAMI DESERT
QUEENSLAND
Tropic of Capricorn
23° 26' 30" S
PILBARA
WESTERN AUSTRALIA
GIBSON DESERT
GREAT VICTORIA DESERT
SOUTH AUSTRALIA
NEW SOUTH WALES
BRISBANE
SYDNEY
CANBERRA
MELBOURNE
VICTORIA
ADELAIDE
PERTH
Geraldton
Kalgoorlie
Albany
GREAT AUSTRALIAN BIGHT
N
W
S

THE ASTRONOMICAL REVOLUTION cont. N. Taylor.

A storm of controversy followed. The Church was violently opposed to the new blasphemy, very much to the disadvantage of an Italian philosopher, Giordano Bruno (1548-1600). Bruno was a Dominican monk and a staunch supporter of the new Copernican theory. He envisaged the Universe as being infinite in size, with an endless number of Sun's, each having its' own retinue of planets and inhabitants theron. Bruno pointed out that the other worlds would also think that they were positioned at the centre of the Universe. In 1600 the Inquisition caught up with him and he was burnt at the stake for his refusal to accept the idea that any absolute truth could exist.

The last, and perhaps greatest of all, pretelescopic observers was Tycho Brahe (1546-1601). Tycho was born to a Noble family an d was initially destined to study the law. However, he was so impressed by the solar eclipse of 1560 that he began to study Astronomy in depth. To his dismay he found that the existing tables of planetary motion were severely in error, and resolved to produce very much more accurate tables. In 1572 he showed that the Supernova seen in that year had been a previously observed star, and hence shattered the belief that the heavens were constant throughout all time. Traditional thoughts again took aknock in 1577 when Tycho showed that the new comet seen in that year had an orbital path far beyond the Moon, and which actually crossed the paths of the planets. The Aristotlian crystalline orbs were well and truly shattered!

Tycho however could not accept the new theory of Copernicua as he had failed to detect any proper motion of individual stars which would be an observable proof of the model. To explain facts ne proposed another model whereby the Sun revolved about the earth, and the rest of the heavenly bodies revolved about the Sun. In 1576 Tycho was granted the island of Ven by the king of Denmark, upon which he had built his castle, Uraniborg, and his observatory, Stjerneborg, and whcih became the centre of the astronomical world. Tycho made many contributions to Astronomy, also notable were his measurements of the yaer and his drastic reformation of the calendar. In 1600 he was joined by young mathematician , Kepler.

Observations of Pluto

D P Payne

The middle of May 1986 gave us some good clear skies ideal, for searching for that elusive planet Pluto. Observations started on the night of the Thursday 15th May. The moon was approaching first quarter and would prove troublesome with low powers.

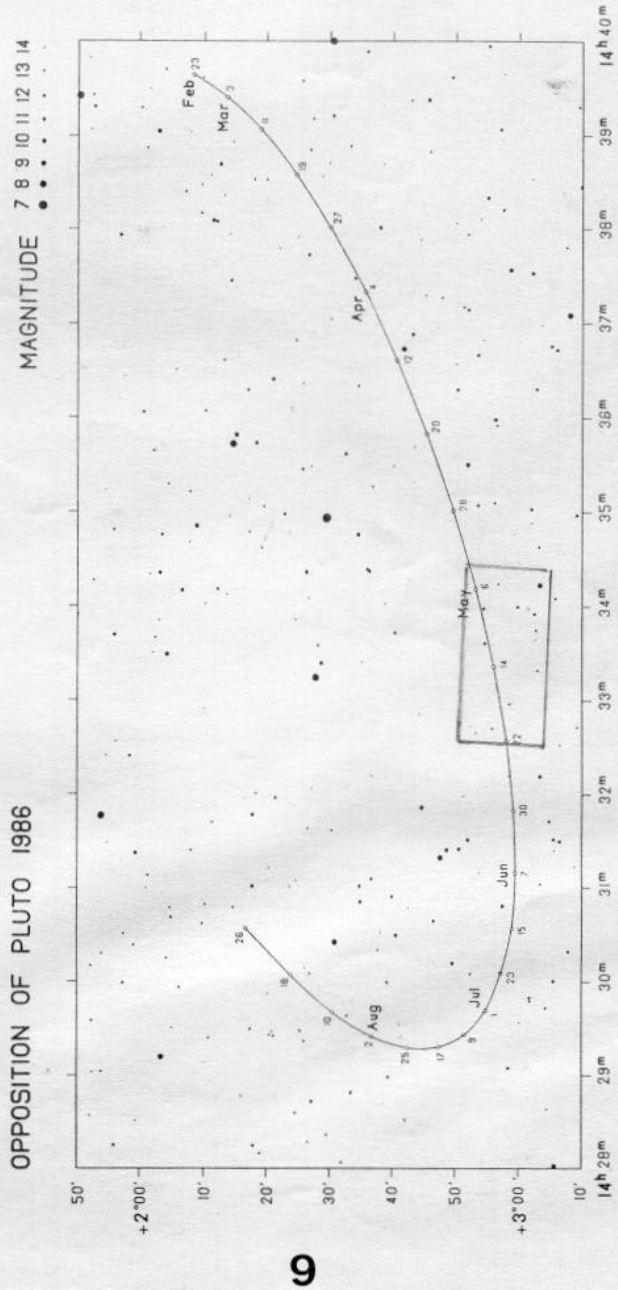
I started the search with binoculars and easily located the star near the centre of the BAA chart shown opposite. This star is about two degrees west of the naked eye star 109 Virginis and is easy to find with Norton's star map or the Sky Atlas 2000.

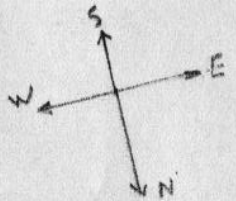
Having centred the ten inch reflector on the previously mentioned star, using a low power eyepiece (x80 Erfle) I proceeded to identify the fainter stars in the area surrounding the position of Pluto. Having located the area of sky where I thought Pluto would be located I increased magnification to darken the sky background and increase contrast. I used a range of magnifications from x80 to x280 to draw the chart shown below. Unfortunately because I had convinced mysely that I knew the position of Pluto I only drew the stars close the position of interest and was wrong! I had thought that Pluto was close to the star marked (A) and because I could see several stars other than those shown on the BAA chart I thought I had found Pluto. However careless plotting and preconception meant that I did not record Pluto that night, in was situated a few minutes of arc further West. Unfortunately I didn't discover my mistake until the following day when I was rechecking the position of Pluto for further observations. However Mike Harlow did manage to record the Planet photographically that same evening!

The next night Friday 16th May was also clear although the Moon was now more troublesome. I quickly found the right area of sky and again using various magnifications proceeded to extend my chart westwards. Again several stars were visible in the telescope which did not appear on the BAA chart, one of them must be Pluto! The next night was cloudy and I was unable to confirm the observation. However the night of Sunday 18th May was again clear, the moon was a problem but with high magnifications I could make out the faint stars seen on the previous nights (albeit with much greater difficulty) and one of them had moved! This must be Pluto! The observations are shown on the drawing made over the three nights (see below). The rectangle shown on the reproduced BAA chart corresponds to the area shown in the drawing. Unfortunately the photograph taken by Mike Harlow is too faint to photocopy but if you come to the observatory he will be willing to show it to you.

PLUTO

Pluto is in Virgo, opposition occurring on April 26, when the magnitude of the planet is 14.





= visible with 280×

very faint

A

Star difficult even at 280×

11:30 (BST) 18-5-86

11:20 (BST) 16-5-86

OBSERVATIONS OF PLUTO

MR. SCHMIDT AND HIS CAMERA by Mike Harlow

Recent issues of Sky & Telescope magazine have carried many photo's of Halley's comet. I noticed in one of these that over a double page spread of seven shots that all had been taken with Schmidt cameras of various sizes. Not only is this the first return of the comet to be studied by spacecraft it is also the first time it has been photographed with these extremely powerful cameras. Invented as recently as 1930 by Bernhard Schmidt, the Schmidt camera has become one of the most useful tools of modern astronomy.
The first part of this article gives a brief biography of Bernhard Schmidt himself; in the second part different types of telescope are discussed showing why the Schmidt camera is so useful, and in the third part I'll show how it is possible to build a small Schmidt camera yourself.

PART 1: Bernhard Schmidt and his work

Bernhard Schmidt was born on 30th March 1879 on the small island of Nargen off the coast of Estonia. Only 5 miles long by 2 miles wide and 12 miles from the mainland life on Nargen was dominated by the church and farming. It is remarkable that from such an isolated environment such an influentiate figure should emerge. Despite his parents emphasis on a strict religious upbringing his instinctive interest in science soon became apparent. When he was eleven he was already experimenting with gunpowder, and as a result he almost lost his life. In one experiment while packing powder into a metal tube it exploded and he lost his right hand and forearm. Yet despite this devastating accident he maintained and developed his interest in maths and physics. In the years that followed he became interested in optics and working from drawings of a camera in a book he ground a lens from the bottom of a bottle, mounted it in a cigar box, and with some photographic plates from his friend the village chemist he actualy took photos with it. This was a sign of greater things to come.
In his late teens he enrolled as an engineering student in Gothenburg, Sweden where he specialised in optics. While studying there he came across the work of the German optician Stehl, and, after completing his studies, Schmidt left for Germany to seek him out. Stehl had worked at Mittweida but when Schmidt arrived Stehl had gone elsewhere. Schmidt however liked the place and stayed on. His interest in optics had developed to such a degree that he could support himself financially by making mirrors and selling them to local amateur astronomers. In the beginning he made them only for the amateurs but soon orders came in from the professionals as well when they realised how good they were. Beginning in 1900 Schmidt made mirrors up to about 8 inches in diameter. In 1905 he made a 16 inch mirror which far surpased anything then available and as his skill developed he worked on figuring 12, 20 and 24 inch objectives for Leipzig, Potsdam and Hamburg observatories. It is remarkable that all his work was carried out with his left hand , his only hand and that he never used machines.

His reputation spread rapidly and he was offered several jobs by the great German optical companies of the day. Despite these offers however Schmidt wished to maintain his independance. A man who disliked regimentation, he worked only as the mood took him.
By 1920 Schmidt had made several mirrors for Hamburg observatory at Bergedorf and in 1926 the director of the observatory, R. Schorr, eventually persuaded Schmidt to join the staff, albeit as a "voluntary colleague" as Schorr described him. Schmidt maintained his irregular, independant style of work, often roaming off into the nearby woods instead of being in the optical workshop.
From the beginning at Bergedorf Schmidt was set on overcoming the limitations of conventional telescopes. The details of his design will be explained in Part 2. In 1929 he went on an eclipse expedition to the Phillipines with the great astronomer Walter Baade and during this trip Schmidt told Baade that he had at last solved the problem, in principle, of producing a reflecting telescope that not only had a large aperture but also had a wide field of view. Baade, realising the importance of this new design, urged Schmidt to build one as soon as possible as did Schorr on hearing the details. Despite this however Schmidt continued his apparently aimless walks in the woods insisting that he had to solve the problem of how to grind the complex curves involved in his design.
In late 1929 he announced that the problem was solved and he began work. His ability to work was phenominal once he started. On one occasion Baade visited him to find him sleeping after 36 hours continuous work. The camera was completed in early 1930 and soon produced fine photographs.
Schmidt's design, described in detail next month, has a large mirror at the bottom of the tube, a thin glass plate at the top end and the film on a curved surface facing the mirror in the middle. The first camera built had a 14 inch glass plate a 17 inch mirror and with a focal length of 25 inches had a photographic speed of f/1.7--incredibly fast for such a large instrument.
Photos from the camera initially failed to impress the European astronomers but as soon as Edwin Hubble of Mount Wilson saw them he immediately asked what was the largest Schmidt camera that could be built. The answer turned out to be 48 inches diameter for the glass plate with a 72 inch mirror and for this reason the two large cameras of Mount Palomar and Siding Springs are of this size. Anything bigger would run into technical problems.
Schmidt continued work until his death on 1st December 1935. The 48 inch Schmidt of mount Palomar was completed in the late 1940's and continues to be of immense value to astronomers; a great tribute to one mans insight and optical genius.

Next month, Part 2---details of the optical design of the Schmidt camera will be described along with its advantages over conventional telescopes.

OPEN EVENINGS

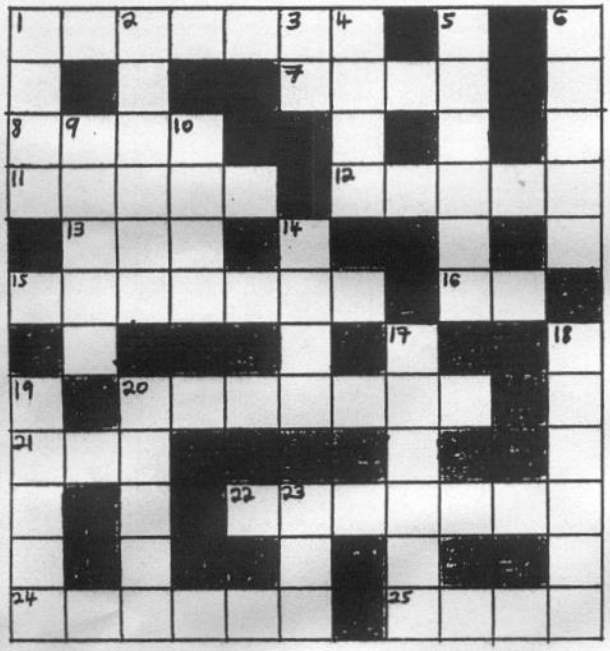
On Friday and Saturday 25th and 26th April the observatory was opened to the public for a last chance to observe Halley's Comet. The friday evening offered near perfect conditions for looking at the comet. The skies were completely clear with an air temperature of near heat wave proportions, when compared to the sub zero ones experienced during the previous open evenings held before last Christmas.

The skies did not become dark enough to find the comet until about 9.30. Early visitors were given a talk on the telescope and a look at Venus. At least 100 visitors arrived during the evening using both the 10" and a pair of 10 x 80 binoculars to observe the comet.

The Saturday evening was a more typical astronomical evening, it rained almost without stop all evening, less than 30 visitors arrived during the 2½ hours we were open. Most of the time was taken up by Roy Cheesman describing his recent experiences he had had on his Australian trip, from which he had only returned on the Friday.

R. Gooding

CROSSWORD



Across

I It also has rings (7)
7 Waits for no man (4)
8 Occurs midday (4)
II Normally elliptical (5)
I2 Use of finderscope (5)
I3 Charged partical (3)
I5 Flower shaped nebula in Monoceros (7)
I6 Moon of jupiter (2)
20 Constellation which killed Orion (7)
2I Spiral galaxy would have one (3)
22 Bright star in Canis Minor (7)
24 Element first discovered in the sun (6)
25 Our moon is covered in them (4)

Down

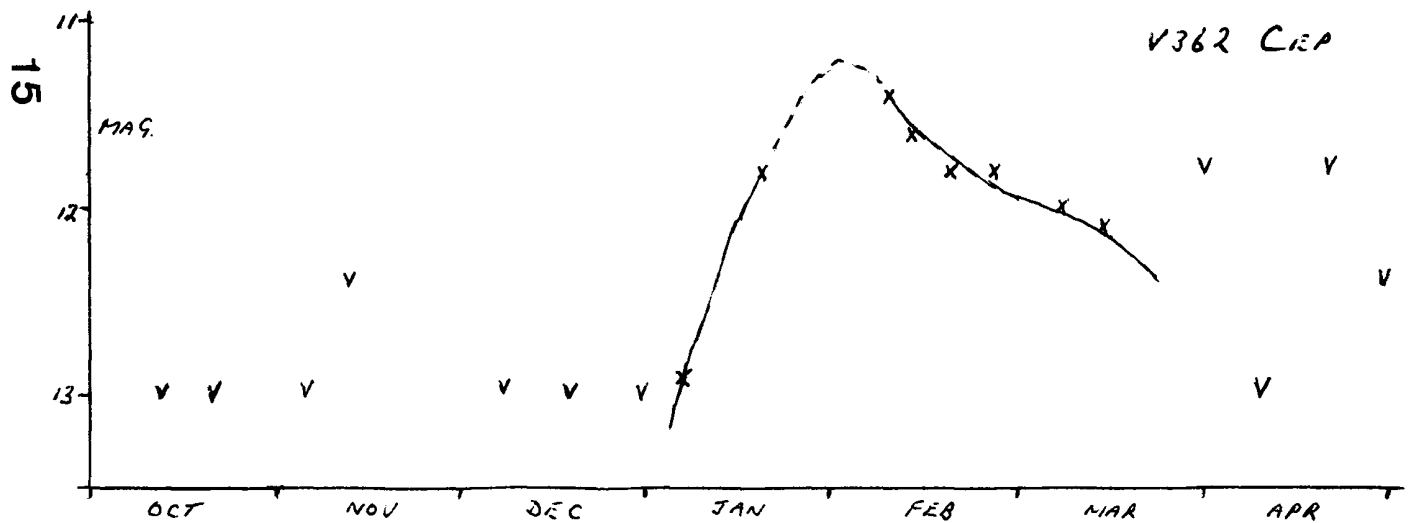
I A large asteroid (4)
2 Moon of Mars (6)
3 Visitor from space(2)
4 Planetary nebula in Lyra (4)
5 Heavenly twins (6)
6 It has a tail (5)
9 He has a belt (5)
I0 Number of planets in the solar system (4)
I4 The sun is one (4)
I7 Fishy constellation(6)
I8 For the Arabs this bird looked like an eagle (6)
I9 Very few people have left it(5)
20 As constellations, Canis Minor & Ursa Minor have this in common(5)
23 It's fleece turned to gold(3)

R A LOBBETT

VARIABLE STAR OBSERVATIONS

by Mike Nicholls

The light curve shows V362 Cephei at maximum during the early part of the year. This is probably only the third maximum of this star ever observed visually. It was observed on Mount Palomar photograpic plates taken in 1933 and was listed as a suspected variable. It is now accepted as a member of the long period class with a period of between 10 and 11 months. It will take several more years of observing to establish a more accurate period. The minima must be at 15th or 16th magnitude at the brightest and I dont know if anyone has ever observed it. Observations were made using an 8" reflector.



PROGRAMME FOR JUNE

MONDAYS from 8pm	DOUBLE STAR & PLANETS SECTION		
2, 9, 16, 23, 30	Mr N Taylor	, Farmlands	
		Trimley	Tel:Fel.
	Mr T Gillan	, Felixstowe	Tel:Fel.
	Miss M Edwards	, Felixstowe	Tel:Fel.
TUESDAYS from 8pm	GENERAL OBSERVATION SECTION		
3, 10, 17, 24	Mr N Gage,	, Trimley	Tel: Fel.
	Mr R Newman	, Felixstowe	Tel: Fel.
	Mr J King,	, Felixstowe	Tel: Fel.
WEDNESDAYS from 8pm	NEBULEA & FAINT OBJECTS SECTION		
4, 11, 18, 25	Mr M Cook,	, Ipswich	Tel: Ips.
	Mr D Payne,	,	
		Wickham Market.	Tel:W.Mkt
FRIDAYS from 8pm	GENERAL OBSERVATION SECTION		
13, 27	Mr R A Lobbett,	,	
		Felixstowe.	Tel:Fel.
	Mr J Hood,	, Ipswich.	Tel:Ips.
	Mr M Harlow,	, Felixstowe	Tel:Fel.

On nights other than Wednesday please contact directors to confirm dates.

1986 COMMITTEE

CHAIRMAN	D Payne	Chapel Lane,	Work:
		Wickham Market, IP13 0SD	Home:
VICE CHAIRMAN	R Cheesman	, Corringham,	Work:
		Essex SS17 9BU	Extn
SECRETARY	R Gooding	, Ipswich	Work:
		IP1 6AE	Home:
TREASURER	M Nicholls	, Capel St. Mary,	Work:
		Ipswich, IP9 2EX	Home:
MEMBERSHIP SEC.	D Barnard	,	Home:
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