ASTRONOMICAL HANDBOOK FOR SOUTHERN AFRICA

1972

published by
the Astronomical Society of Southern Africa

ASTRONOMICAL SOCIETY OF SOUTHERN AFRICA

INFORMATION FOR PROSPECTIVE MEMBERS

The Astronomical Society of Southern Africa is a body consisting of both amateur and professional astronomers. Membership is open to all interested persons, regardless of knowledge or experience. In addition to this handbook, the Society issues twelve numbers of "The Monthly Notes of the Astronomical Society of Southern Africa" (MNASSA) each year. Members also receive copies of "Sky and Telescope", an excellent and very popular monthly magazine published in the United States. It provides up to date information on both professional and amateur activities, together with news of space research and other related subjects. The society's annual subscription is R6.00 and there is an entrance fee of R2.50. Information can be obtained from the Honorary Secretary, Astronomical Society of Southern Africa, c/o The South African Astronomical Observatory, Observatory, Cape.

Autonomous local Centres of the Society exist in Cape Town, Bloemfontein, Durban, Johannesburg and Pretoria. These centres hold regular meetings. It is not necessary to hold full membership of the society to join these centres. An Associate Member or Student Member may take part in the activities of a Centre without paying any fees or subscriptions to the Society; although he then loses the right to receive the publications issued and distributed by the Society.

Three Observing Sections exist to coordinate and encourage constructive observing programmes; namely the Comet and Meteor Section, the Occultation Section and the Variable Star Section.

Further information on the Centres and Observing Sections is given on the inside back cover of this handbook.

ASTRONOMICAL HANDBOOK FOR SOUTHERN AFRICA

1972

Dedicated to the memory of Isaac Weinberg who for many years contributed greatly to the preparation of this handbook

CONTENTS

This Handbook was prepared in the Department of Astronomy, University of Cape Town, with the assistance of the Computing and Comet and Meteor Sections of the Society. Acknowledgement is made to: Miss Y.Z.R. Thomas for manuscript typing; the staff of the Photographic and Printing Department, University of Cape Town Libraries, for photographic reductions and manuscript preparation; H.M. Nautical Almanac Office, Royal Greenwich Observatory, for occultation predictions; U.S. Naval Observatory, Washington D.C., for permission to reproduce diagrams of Jupiter's satellites.

All correspondence concerning this booklet should be addressed to the Handbook Editor, Astronomical Society of Southern Africa, Department of Astronomy, University of Cape Town, Rondebosch, Cape. Further copies can also be obtained from the same address. Enclose a postal order (or cheque) for 50 cents per copy.

Although every care has been taken in the compilation of the Handbook, it is distributed and sold on the explicit condition that neither the Astronomical Society of Southern Africa nor any of its members accepts any responsibility for errors.

P & P UCT

NOTE

Unless stated otherwise, all times given in this Handbook are South African Standard Time (SAST) which is the standard time throughout Southern Africa. It is used on a 24 hour basis - for example 1800 hrs SAST is 6.00 p.m., and 0541 hrs SAST is 5:41 a.m.

Decimals are indicated by points rather than commas.

DIARY AND CALENDAR FOR 1972

Being a summary of astronomical events for the year 1972. More detailed information of individual events (and explanations of terms) can be found in the appropriate sections (as listed on the Contents page opposite).

JANUARY

S	M	T	W	T	F	S
·	·	·	·	·	·	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	·	·	·	·	·

Evening sky: Orion-Taurus prominent (high above northern horizon). Venus, Mars and Saturn visible.

	1^d	16^h	
Jan			Mercury at greatest elonga-
			23° W (visible in morning sky)
	3	18	Earth closest to Sun (peri-
			helion)
	8	16	Moon - Last Quarter
	16	13	New Moon (Annular Eclipse of Sun not visible from Southern Africa)
	20	12	Sun overhead at Bulawayo
	23	11	Moon - First Quarter
	30	12	Sun overhead at Salisbury
	30	13	Full Moon (Total Eclipse not visible from Southern Africa)

FEBRUARY

S	M	T	W	T	F	S
·	·	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	·	·	·	·
·	·	·	·	·	·	·

Evening sky: Orion prominent. Venus, Mars and Saturn visible.

	7^d	13^h	
Feb			Moon - Last Quarter
	9	08	Daytime occultation of Antares. Graze track passes just south of Bloemfontein. Complete occultation for points north.
	11	01	Jupiter 3° N of Moon (at time of rising)
	15	02	New Moon
	17	09	Mercury in superior conjunction (on far side of Sun)
	21	18	Saturn 7° S of Moon
	21	19	Moon - First Quarter
	29	05	Full Moon

MARCH

S	M	T	W	T	F	S
·	·	·	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	·
·	·	·	·	·	·	·

Evening sky: Orion in west. Mercury, Venus, Mars and Saturn visible.

	7^d	16^h	
Mar			Occultation of Antares not visible from Southern Africa.
	8	09	Moon - Last Quarter
	14	12	Mercury at greatest elongation 18° E (visible in even

Mar		ing twilight)
		Corona Australid Meteor Shower
	15^d 14^h	New Moon
	18 20	Venus 3° S of Moon
	19 16	Mars 4° S of Moon
	20 12	Equinox
	21 07	Pluto at opposition (closest to Earth)
	22 04	Moon - First Quarter
	25 01	Grazing occultation of Delta Cnc visible from Southern Africa
	29 22	Full Moon
	31 14	Mercury in inferior conjunction (between Earth and Sun)

APRIL

S	M	T	W	T	F	S
·	·	·	·	·	·	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	·	·	·	·	·	·

Evening sky: Southern Cross high in south, Leo in north. Venus, Mars and Saturn visible early evening. Jupiter visible late evening.

Apr	1^d 09^h	Mars 3° N of Saturn
	3 23	Occultation of Antares not visible from Southern Africa
	6 02	Uranus at Opposition (closest to Earth)
	7 02	Moon - Last Quarter
	8 02	Venus at greatest elongation 46° E (visible in evening sky)
	8 13	Venus 5° N of Saturn
	12 05	Mars 7° N of Aldebaran
	13 23	New Moon
	15 04	Venus 9° N of Aldebaran
	17 04	Occultation of Venus not visible from Southern Africa
	19-24	April Lyrid Meteor Shower
	20 15	Moon - First Quarter
	22 22	Venus 3° N of Mars
	28 14	Mercury at greatest elongation 27° W (visible in morning sky)
Apr	28^d 15^h	Full Moon

MAY

S	M	T	W	T	F	S
·	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	·	·	·
·	·	·	·	·	·	·

Evening sky: Southern Cross and Leo high in sky. Plough (Ursa Major) visible over northern horizon from Rhodesia. Venus and Mars visible early evening. Jupiter rises at 8.00 p.m. by mid-May.

May	1^d 05^h	Occultation of Antares not visible from southern Africa
	6 14	Moon - Last Quarter
	11 13	Venus greatest brilliancy (in evening sky)
	13 06	New Moon
	15 22	Venus 2° N of Moon (after setting)
	15 22	Mars 1° S of Moon (after setting) - Occultation visible from Europe
	17 08	Venus 3° N of Mars
	25 02	Neptune at opposition (closest to Earth)
	28 06	Full Moon
	28 11	Occultation of Antares not visible from Southern Africa
	30 17	Jupiter 2° N of Moon (before rising)
	31 10	Saturn in conjunction with Sun (on far side of Sun)

JUNE

S	M	T	W	T	F	S
·	·	·	·	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	·
·	·	·	·	·	·	·

Evening sky: Scorpius in east, Southern Cross high. Jupiter visible.

Jun	4^d 23^h	Moon - Last Quarter
	4 23	Mercury in superior con-

Jun	7[d] 18[h]	junction (on far side of Sun) Jupiter's satellites - numerous phenomena during evening
10-21		June Lyrid Meteor Shower
11	14	New Moon
13	15	Daytime Occultation of Mars visible from Southern Africa
14	18+	Jupiter's satellites - numerous phenomena during evening
17	17	Venus in inferior conjunction (between Earth and Sun)
17-26		Ophiuchid Meteor Shower
18	18	Moon - First Quarter
19	00	Mars 6° S of Pollux
21	09	Solstice - midwinter
24	18	Occultation of Antares not visible from Southern Africa
24	19	Mercury 5° S of Pollux
24	23	Jupiter at opposition (closest to Earth)
26	17	Jupiter 2° N of Moon (at time of rising)
26	21	Full Moon
28	18	Mercury 0°.3 N of Mars

JULY

S	M	T	W	T	F	S
·	·	·	·	·	·	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	·	·	·	·	·

Evening sky: Scorpius overhead, Sagittarius to the east. Jupiter visible.

Jul	4[d] 05[h]	Moon - Last Quarter
	5 03	Earth furthest from Sun (aphelion)
	8 20+	Jupiter's satellites - numerous phenomena during evening
	10 22	New Moon (Total Eclipse of the Sun not visible from Southern Africa)
	11 01	Mercury at greatest elongation 26° E (visible in evening sky)
	12[d] 09[h]	Mars 2° N of Moon
	12 23	Mercury 1° N of Moon - occultation visible from Antartica
	16 19+	Jupiter's satellites - numerous phenomena during evening
	18 10	Moon - First Quarter
	22 01	Antares 1° S of Moon - occultation visible from Europe
	23 18	Jupiter 2° N of Moon
	24 11	Venus greatest brilliancy (in morning sky)
	26 09	Full Moon (Partial Eclipse not visible from Southern Africa)
	29 17	Mercury 6° S of Mars

AUGUST

S	M	T	W	T	F	S
·	·	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	·	·
·	·	·	·	·	·	·

Evening sky: Scorpius-Sagittarius near overhead, Cygnus in north east. Jupiter visible.

Aug	2[d] 10[h]	Moon - Last Quarter
	7 22	Mercury in inferior conjunction (between Earth and Sun)
	9 07	New Moon
	17 03	Moon - First Quarter
	18 09	Occultation of Antares not visible from Southern Africa
	20 00	Jupiter 2° N of Moon
	24 20	Full Moon
	25 17	Mercury at greatest elongation 18° W (visible in morning twilight)
	27 04	Venus at greatest elongation 46° W (in morning sky)
	31 15	Moon - Last Quarter

SEPTEMBER

S	M	T	W	T	F	S
·	·	·	·	·	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
·	·	·	·	·	·	·

Evening sky: Scorpius-Sagittarius in west. Jupiter visible.

Sep	2	15	Venus 9° S of Pollux
	5	01	Mercury 1°.1 N of Regulus (visible in morning twilight)
	7	13	Mars in conjunction with Sun
	7	19	New Moon
	14	17	Occultation of Antares not visible from Southern Africa
	15	21	Moon - First Quarter
	19	22	Mercury in superior conjunction (on far side of Sun)
	23	01	Equinox
	23	06	Full Moon
	24	23	Pluto in conjunction with Sun (on far side of Sun)
	29	21	Moon - Last Quarter

OCTOBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	·	·	·	·
·	·	·	·	·	·	·

Evening sky: Scorpius-Sagittarius over western horizon. Jupiter visible. Saturn rises late evening.

Oct	4	21	Mercury 2° N of Spica (visible in evening twilight)
	5	01	Venus 0°.3 S of Regulus
	7	10	New Moon
	12	01	Uranus in conjunction with Sun (on far side of Sun)
	13	23	Jupiter 2° N of Moon
	15	15	Moon - First Qusrter
	22	15	Full Moon
	26	01	Saturn 4° S of Moon
	29	07	Moon - Last Quarter
	31	14	Mars 0°.2 N of Uranus

NOVEMBER

S	M	T	W	T	F	S
·	·	·	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	·	·
·	·	·	·	·	·	·

Evening sky: Sagittarius in west, Taurus in northeast. Orion visible late evening. Andromeda in north. Saturn and Jupiter visible.

Nov	4	09	Mars 3° N of Spica
	5	12	Mercury at greatest elongation 23° E (visible in evening sky)
	6	03	New Moon
	8	06	Occultation of Mercury not visible from Southern Africa
	8	14	Mercury 1°.8 N of Antares
	10	15	Occultation of Jupiter visible from Antartica
	12	12	Sun overhead at Salisbury
	14	07	Moon - First Quarter
	14-20		Leonid Meteor Shower
	18	01	Venus 4° N of Spica
	18	21	Grazing Occultation of Eta Psc visible from Southern Africa
	21	01	Full Moon
	22	12	Sun overhead at Bulawayo
	26	06	Mercury in inferior conjunction (between Earth and Sun)
	27	05	Neptune in conjunction with Sun on far side
	27	20	Moon - Last Quarter

DECEMBER

S	M	T	W	T	F	S
·	·	·	·	·	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	·	·	·	·	·	·

Evening sky: Taurus, Orion, Canis Major prominent in eastern sky. Saturn visible.

Dec	3	08	Venus 7° N of Moon
	3	08	Mars 5° N of Moon

4^{d}	01^{h}	Venus 1°.3 N of Mars
5	19-24	Phoenicid Meteor Shower
5	22	New Moon
7-15		Geminid Meteor Shower
8	08	Occultation of Jupiter visible from Madagascar
9	04	Saturn at opposition (closest to Earth)
13	21	Moon - First Quarter
14	08	Mercury at greatest elongation 21° W (visible in morning sky)
18^{d}	08^{h}	Mercury 0°.2 N of Neptune (visible in morning sky)
19	17	Saturn 4° S of Moon (just before rising)
20	12	Full Moon
21	20	Solstice - midsummer (Sun over Tropic of Capricorn)
23	16	Venus 0°.4 S of Neptune
25	16	Venus 6° N of Antares
27	12	Moon - Last Quarter

JULIAN DATE AT 1400 HRS

The Julian Calendar is generally used for recording the time of variable star observations. It numbers the days consecutively from the beginning of the Julian era in 4713 B.C. The Julian day begins at Greenwich mean noon, that is, at 1400 hrs (2 p.m.) SAST. The Julian date on 1972 Jan 1, at 1400 hrs is 2 441 318.0 — the first four digits are not repeated for each entry in the table below.

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	2441	2441	2441	2441	2441	2441	2441	2441	2441	2441	2441	2441
1	318.0	349.0	378.0	409.0	439.0	470.0	500.0	531.0	562.0	592.0	623.0	653.0
2	319.0	350.0	379.0	410.0	440.0	471.0	501.0	532.0	563.0	593.0	624.0	654.0
3	320.0	351.0	380.0	411.0	441.0	472.0	502.0	533.0	564.0	594.0	625.0	655.0
4	321.0	352.0	381.0	412.0	442.0	473.0	503.0	534.0	565.0	595.0	626.0	656.0
5	322.0	353.0	382.0	413.0	443.0	474.0	504.0	535.0	566.0	596.0	627.0	657.0
6	323.0	354.0	383.0	414.0	444.0	475.0	505.0	536.0	567.0	597.0	628.0	658.0
7	324.0	355.0	384.0	415.0	445.0	476.0	506.0	537.0	568.0	598.0	629.0	659.0
8	325.0	356.0	385.0	416.0	446.0	477.0	507.0	538.0	569.0	599.0	630.0	660.0
9	326.0	357.0	386.0	417.0	447.0	478.0	508.0	539.0	570.0	600.0	631.0	661.0
10	327.0	358.0	387.0	418.0	448.0	479.0	509.0	540.0	571.0	601.0	632.0	662.0
11	328.0	359.0	388.0	419.0	449.0	480.0	510.0	541.0	572.0	602.0	633.0	663.0
12	329.0	360.0	389.0	420.0	450.0	481.0	511.0	542.0	573.0	603.0	634.0	664.0
13	330.0	361.0	390.0	421.0	451.0	482.0	512.0	543.0	574.0	604.0	635.0	665.0
14	331.0	362.0	391.0	422.0	452.0	483.0	513.0	544.0	575.0	605.0	636.0	666.0
15	332.0	363.0	392.0	423.0	453.0	484.0	514.0	545.0	576.0	606.0	637.0	667.0
16	333.0	364.0	393.0	424.0	454.0	485.0	515.0	546.0	577.0	607.0	638.0	668.0
17	334.0	365.0	394.0	425.0	455.0	486.0	516.0	547.0	578.0	608.0	639.0	669.0
18	335.0	366.0	395.0	426.0	456.0	487.0	517.0	548.0	579.0	609.0	640.0	670.0
19	336.0	367.0	396.0	427.0	457.0	488.0	518.0	549.0	580.0	610.0	641.0	671.0
20	337.0	368.0	397.0	428.0	458.0	489.0	519.0	550.0	581.0	611.0	642.0	672.0
21	338.0	369.0	398.0	429.0	459.0	490.0	520.0	551.0	582.0	612.0	643.0	673.0
22	339.0	370.0	399.0	430.0	460.0	491.0	521.0	552.0	583.0	613.0	644.0	674.0
23	340.0	371.0	400.0	431.0	461.0	492.0	522.0	553.0	584.0	614.0	645.0	675.0
24	341.0	372.0	401.0	432.0	462.0	493.0	523.0	554.0	585.0	615.0	646.0	676.0
25	342.0	373.0	402.0	433.0	463.0	494.0	524.0	555.0	586.0	616.0	647.0	677.0
26	343.0	374.0	403.0	434.0	464.0	495.0	525.0	556.0	587.0	617.0	648.0	678.0
27	344.0	375.0	404.0	435.0	465.0	496.0	526.0	557.0	588.0	618.0	649.0	679.0
28	345.0	376.0	405.0	436.0	466.0	497.0	527.0	558.0	589.0	619.0	650.0	680.0
29	346.0	377.0	406.0	437.0	467.0	498.0	528.0	559.0	590.0	620.0	651.0	681.0
30	347.0		407.0	438.0	468.0	499.0	529.0	560.0	591.0	621.0	652.0	682.0
31	348.0		408.0		469.0		530.0	561.0		622.0		683.0

THE SUN

The Earth is closest to the Sun on January 3 (perihelion) and furthest from the Sun on July 5 (aphelion). The Sun is over the Tropic of Cancer on June 21 (midwinter solstice) and over the Tropic of Capricorn on December 21 (midsummer solstice). It crosses the equator on March 20 and September 23 (equinoxes). During the course of the year, the Sun appears to move once around the sky - against the constellations of the Zodiac. The movement of the Sun along its apparent path, the ecliptic, appears in the planetary diagram on pages 20 and 21 (centre pages of this Handbook).

The 11-year sunspot cycle is past maximum, but observers viewing the Sun's disk should still see a reasonable number of spots. Permanent damage to the eye can be caused by looking at the Sun directly; the best way of observing is to use a telescope to project an image of the solar disk onto a piece of paper.

The table on the page opposite gives the times of Sunrise and Sunset (times when the upper limb of the Sun, as affected by refraction, is on the horizon) for cities in Southern Africa. The table below gives the times of the Sun's transit, apparent noon, over the 30° meridian - for explanation of the difference between apparent noon and SAST (mean solar) noon, known as the Equation of Time, a textbook on astronomy should be consulted.

TIME OF SUN'S TRANSIT FOR LONGITUDE 30° E

		h m s			h m s			h m s
Jan	1	12 03 14	May	10	11 56 21	Sep	17	11 54 26
	11	12 07 39		20	11 56 28		27	11 50 56
	21	12 11 09		30	11 57 28	Oct	7	11 47 48
	31	12 13 23	Jun	9	11 59 10		17	11 45 21
Feb	10	12 14 17		19	12 01 16		27	11 43 53
	20	12 13 54		29	12 03 23	Nov	6	11 43 40
Mar	1	12 12 23	Jul	9	12 05 19		16	11 44 49
	11	12 10 03		19	12 06 14		26	11 47 21
	21	12 07 12		29	12 06 23	Dec	6	11 51 07
	31	12 04 10	Aug	8	12 05 34		16	11 55 44
Apr	10	12 01 18		18	12 03 46		26	12 00 40
	20	11 58 54		28	12 01 09			
	30	11 57 11	Sep	7	11 57 57			

TIMES OF SUNRISE AND SUNSET

	CAPE TOWN		DURBAN		BLOEMFONTEIN		JOHANNESBURG		SALISBURY	
	SUNRISE	SUNSET	SUNRISE	SUNSET	SUNRISE	SUNSET	SUNRISE	SUNSET	SUNRISE	SUNSET
Jan 1	05h 38m	20h 01m	04h 58m	19h 01m	05h 21m	19h 18m	05h 18m	19h 04m	05h 24m	18h 35m
11	05 46	20 02	05 06	19 02	05 29	19 18	05 25	19 05	05 29	18 37
21	05 55	19 59	05 14	19 00	05 37	19 17	05 33	19 04	05 37	18 38
Feb 1	06 07	19 52	05 24	18 55	05 46	19 13	05 42	19 00	05 42	18 36
11	06 17	19 44	05 32	18 48	05 54	19 06	05 49	18 55	05 47	18 32
21	06 26	19 33	05 41	18 39	06 02	18 57	05 56	18 47	05 52	18 27
Mar 1	06 33	19 23	05 46	18 30	06 08	18 48	06 00	18 39	05 55	18 21
11	06 41	19 11	05 53	18 19	06 13	18 38	06 06	18 29	05 57	18 15
21	06 49	18 58	05 59	18 08	06 18	18 27	06 11	18 19	06 00	18 06
Apr 1	06 58	18 41	06 06	17 53	06 25	18 13	06 17	18 06	06 02	17 57
11	07 04	18 30	06 11	17 43	06 30	18 03	06 21	17 56	06 04	17 50
21	07 13	18 17	06 17	17 31	06 35	17 52	06 25	17 47	06 07	17 43
May 1	07 20	18 05	06 24	17 22	06 42	17 44	06 31	17 38	06 10	17 37
11	07 28	17 57	06 31	17 14	06 49	17 36	06 37	17 31	06 13	17 32
21	07 34	17 50	06 36	17 08	06 54	17 30	06 41	17 26	06 16	17 29
Jun 1	07 43	17 45	06 43	17 04	07 01	17 27	06 47	17 23	06 20	17 28
11	07 48	17 44	06 48	17 03	07 05	17 26	06 52	17 22	06 23	17 27
21	07 51	17 44	06 51	17 04	07 08	17 27	06 55	17 24	06 26	17 29
Jul 1	07 53	17 48	06 53	17 07	07 10	17 30	06 57	17 27	06 27	17 32
11	07 51	17 52	06 51	17 11	07 08	17 34	06 55	17 30	06 27	17 35
21	07 47	17 58	06 48	17 16	07 05	17 39	06 53	17 35	06 26	17 40
Aug 1	07 39	18 06	06 42	17 22	07 00	17 45	06 48	17 41	06 23	17 42
11	07 30	18 13	06 34	17 29	06 53	17 51	06 41	17 46	06 18	17 46
21	07 19	18 20	06 24	17 35	06 42	17 55	06 32	17 50	06 11	17 48
Sep 1	07 06	18 27	06 12	17 40	06 31	18 01	06 21	17 54	06 04	17 49
11	06 52	18 34	06 00	17 46	06 19	18 06	06 11	17 59	05 55	17 51
21	06 38	18 41	05 48	17 51	06 07	18 10	05 59	18 03	05 46	17 52
Oct 1	06 25	18 48	05 37	17 57	05 57	18 16	05 50	18 08	05 39	17 54
11	06 12	18 55	05 25	18 03	05 45	18 22	05 39	18 12	05 30	17 57
21	05 58	19 04	05 12	18 09	05 33	18 27	05 27	18 17	05 23	17 59
Nov 1	05 46	19 13	05 02	18 17	05 24	18 35	05 19	18 24	05 16	18 03
11	05 38	19 23	04 55	18 26	05 17	18 44	05 13	18 32	05 14	18 08
21	05 31	19 33	04 49	18 34	05 12	18 52	05 08	18 39	05 11	18 13
Dec 1	05 29	19 43	04 48	18 42	05 11	19 00	05 07	18 46	05 12	18 19
11	05 28	19 50	04 48	18 50	05 11	19 07	05 08	18 53	05 14	18 25
21	05 32	19 57	04 52	18 57	05 15	19 14	05 12	19 00	05 18	18 31

THE MOON

The Moon is best positioned for evening viewing from three or four days before First Quarter to shortly after Full Moon. Phases are given in the table below, and times of Moonrise and Moonset for Cape Town and Johannesburg follow on Pages 10 to 13. Times of Moonrise and Moonset for other places can be roughly estimated from these tables.

New Moon				First Quarter				Full Moon				Last Quarter			
	16^{d}	12^{h}	52^{m}		23^{d}	11^{h}	29^{m}		30^{d}	12^{h}	58^{m}		8^{d}	15^{h}	31^{m}
Jan				Jan				Jan				Jan			
Feb	15	02	29	Feb	21	19	20	Feb	29	05	12	Feb	7	13	11
Mar	15	13	35	Mar	22	04	12	Mar	29	22	05	Mar	8	09	05
Apr	13	22	31	Apr	20	14	45	Apr	28	14	44	Apr	7	01	44
May	13	06	08	May	20	03	16	May	28	06	28	May	6	14	26
Jun	11	13	30	Jun	18	17	41	Jun	26	20	46	Jun	4	23	22
Jul	10	21	39	Jul	18	09	46	Jul	26	09	24	Jul	4	05	25
Aug	9	07	26	Aug	17	03	09	Aug	24	20	22	Aug	2	10	02
Sep	7	19	28	Sep	15	21	13	Sep	23	06	07	Aug	31	14	48
Oct	7	10	08	Oct	15	14	55	Oct	22	15	25	Sep	29	21	16
Nov	6	03	21	Nov	14	07	01	Nov	21	01	07	Oct	29	06	41
Dec	5	22	24	Dec	13	20	36	Dec	20	11	45	Nov	27	19	45
												Dec	27	12	27

Dates of Perigee, when the Moon is closest to the Earth, and Apogee, when it reaches its furthest point, are given below.

PERIGEE						APOGEE					
	28^{d}	07^{h}		3^{d}	17^{h}		9^{d}	06^{h}		16^{d}	17^{h}
Dec			Aug			Jan			Aug		
Jan	22	07	Aug	28	22	Feb	6	03	Sep	13	12
Feb	17	21	Sep	25	09	Mar	4	21	Oct	11	05
Mar	16	23	Oct	23	14	Apr	1	09	Nov	7	15
Apr	14	08	Nov	21	02	Apr	28	12	Jan	1	00
May	12	19	Dec	19	15	May	25	17	Jan	28	18
Jun	10	02	Jan	16	23	Jun	22	05			
Jul	8	01				Jul	19	22			

As a result of its motion around the Earth, the Moon appears to make a complete circuit of the heavens in just under a month. It occasionally passes in front of bright stars (details given in Occultation section - page 32) and close to visible planets (details given in Diary - page 1).

Terminator and Librations

During the changing phases, the terminator (boundary between night and day) progresses from left to right in the diagram. Since the Moon does not follow a perfectly circular orbit, and its axis is not parallel to the Earth's axis, it is cometimes possible to see a slightly greater proportion of one limb than the opposite one. Maximum exposure (maximum libration) of the southern limb (about 7.7 degrees) occurs on Jan 23, Feb 19, Mar 18, Apr 14, May 11, Jun 7, Jul 5, Aug 1, Aug 28, Sep 24, Oct 22, Nov 18 and Dec 15, and that of the northern limb on Jan 10, Feb 6, Mar 4, Mar 31, Apr 27, May 24, Jun 21, Jul 18, Aug 14, Sep 10, Oct 8, Nov 4, Dec 1 and Dec 28. Maximum exposure of the left hand limb (in diagram) occurs on Jan 2, Jan 29, Feb 25, Mar 23, Apr 20, May 18, Jun 15, Jul 13, Aug 10, Sep 5, Oct 2, Oct 29, Nov 27 and Dec 25, and that of the right hand limb (in diagram) on Jan 15, Feb 12, Mar 11, Apr 8, May 6, Jun 3, Jun 30, Jul 27, Aug 23, Sept 19, Oct 17, Nov 15 and Dec 13. The magnitude of these east-west librations is smallest in January and July (about 5 degrees) and greatest in April and November (nearly 8 degrees).

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	19h 50m	20h 13m	19h 13m	19h 23m	19h 33m	21h 11m	22h 02m	.....	1h 13m	1h 53m	2h 22m	1h 58m
2	20 34	20 43	19 43	20 03	20 25	22 10	23 01	0 04	2 13	2 36	2 54	2 30
3	21 10	21 13	20 14	20 47	21 21	23 09	.....	1 10	3 08	3 14	3 25	3 06
4	21 43	21 43	20 46	21 36	22 18	.....	0 02	2 16	3 55	3 47	3 56	3 46
5	22 15	22 14	21 24	22 31	23 17	0 08	1 05	3 20	4 37	4 20	4 30	4 30
6	22 45	22 48	22 05	23 28	.....	1 08	2 12	4 19	5 13	4 51	5 07	5 17
7	23 13	23 27	22 51	.....	0 16	2 11	3 20	5 13	5 46	5 22	5 48	6 09
8	23 44	.....	23 43	0 26	1 17	3 18	4 28	5 59	6 19	5 54	6 32	7 03
9	.....	0 11	.....	1 27	2 18	4 27	5 32	6 39	6 50	6 29	7 21	7 58
10	0 16	1 01	0 40	2 29	3 22	5 37	6 30	7 14	7 22	7 08	8 13	8 54
11	0 52	1 56	1 40	3 32	4 29	6 46	7 21	7 47	7 54	7 50	9 08	9 50
12	1 34	2 56	2 42	4 37	5 39	7 49	8 06	8 19	8 30	8 35	10 04	10 46
13	2 20	3 59	3 46	5 45	6 50	8 45	8 43	8 51	9 09	9 26	11 00	11 43
14	3 14	5 03	4 50	6 54	8 01	9 32	9 17	9 23	9 53	10 19	11 57	12 41
15	4 12	6 07	5 55	8 05	9 08	10 12	9 50	9 55	10 41	11 15	12 54	13 42
16	5 13	7 11	7 01	9 15	10 06	10 47	10 21	10 32	11 33	12 12	13 53	14 48
17	6 16	8 15	8 08	10 24	10 56	11 20	10 51	11 14	12 29	13 10	14 55	15 56
18	7 20	9 19	9 17	11 24	11 40	11 51	11 23	11 59	13 26	14 10	16 01	17 06
19	8 22	10 25	10 27	12 18	12 17	12 21	11 58	12 50	14 26	15 10	17 11	18 15
20	9 24	11 32	11 34	13 03	12 50	12 52	12 37	13 45	15 27	16 12	18 22	19 19
21	10 26	12 39	12 37	13 43	13 21	13 24	13 20	14 42	16 28	17 18	19 33	20 15
22	11 29	13 43	13 33	14 17	13 50	14 00	14 07	15 42	17 30	18 27	20 39	21 02
23	12 34	14 43	14 22	14 49	14 20	14 41	15 01	16 43	18 34	19 37	21 38	21 45
24	13 40	15 37	15 05	15 18	14 51	15 25	15 58	17 44	19 41	20 48	22 29	22 21
25	14 45	16 23	15 42	15 48	15 24	16 15	16 56	18 45	20 49	21 56	23 12	22 54
26	15 50	17 05	16 15	16 18	16 02	17 10	17 56	19 47	21 58	22 56	23 50	23 27
27	16 48	17 40	16 46	16 49	16 44	18 07	18 56	20 50	23 05	23 50	.....	23 59
28	17 41	18 13	17 16	17 24	17 30	19 05	19 56	21 55	.....	.....	0 23	.....
29	18 26	18 44	17 45	18 02	18 21	20 04	20 56	23 02	0 08	0 35	0 55	0 31
30	19 07		18 15	18 46	19 16	21 03	21 57	.....	1 05	1 14	1 26	1 06
31	19 41		18 47		20 13		22 59	0 09		1 49		1 44

JOHANNESBURG - MOONSET 1972

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	5h 35m	7h 23m	7h 01m	8h 25m	9h 02m	10h 11m	10h 01m	10h 25m	11h 46m	12h 49m	14h 35m	15h 09m
2	6 40	8 17	7 53	9 19	9 54	10 49	10 35	11 09	12 49	13 50	15 27	16 03
3	7 41	9 09	8 45	10 14	10 43	11 25	11 09	11 57	13 52	14 48	16 20	16 57
4	8 39	10 01	9 38	11 07	11 29	11 59	11 46	12 52	14 55	15 45	17 14	17 51
5	9 35	10 54	10 32	11 59	12 11	12 33	12 26	13 52	15 57	16 39	18 08	18 43
6	10 28	11 47	11 26	12 47	12 49	13 09	13 11	14 57	16 55	17 33	19 02	19 34
7	11 19	12 42	12 21	13 32	13 25	13 48	14 03	16 03	17 52	18 26	19 56	20 21
8	12 11	13 37	13 15	14 14	14 00	14 31	15 01	17 06	18 46	19 20	20 48	21 05
9	13 04	14 32	14 06	14 53	14 36	15 19	16 06	18 07	19 40	20 14	21 37	21 45
10	13 58	15 27	14 55	15 29	15 13	16 16	17 13	19 05	20 34	21 08	22 23	22 21
11	14 53	16 18	15 40	16 06	15 55	17 20	18 19	20 02	21 28	22 01	23 06	22 55
12	15 49	17 06	16 22	16 43	16 42	18 27	19 22	20 56	22 22	22 53	23 45	23 29
13	16 46	17 50	17 00	17 24	17 36	19 34	20 22	21 50	23 16	23 42	.....	.....
14	17 39	18 29	17 37	18 08	18 36	20 38	21 19	22 43	.....	.....	0 21	0 02
15	18 29	19 07	18 13	18 57	19 42	21 39	22 14	23 38	0 09	0 27	0 55	0 37
16	19 15	19 43	18 52	19 55	20 48	22 37	23 07	.....	1 00	1 09	1 30	1 16
17	19 57	20 19	19 34	20 55	21 52	23 31	.....	0 32	1 49	1 48	2 05	2 00
18	20 34	20 58	20 19	21 59	22 53	.....	0 01	1 26	2 34	2 25	2 43	2 49
19	21 09	21 38	21 10	23 03	23 51	0 23	0 53	2 19	3 16	2 59	3 26	3 47
20	21 44	22 23	22 07	.....	.....	1 16	1 47	3 10	3 54	3 35	4 13	4 53
21	22 20	23 16	23 06	0 04	0 46	2 09	2 42	3 57	4 30	4 13	5 09	6 02
22	22 57	.....	.....	1 02	1 39	3 02	3 36	4 42	5 07	4 54	6 11	7 11
23	23 39	0 12	0 09	1 58	2 30	3 56	4 29	5 22	5 43	5 39	7 18	8 17
24	.....	1 12	1 11	2 51	3 22	4 51	5 19	6 00	6 22	6 30	8 27	9 20
25	0 26	2 15	2 10	3 43	4 14	5 45	6 05	6 35	7 04	7 28	9 33	10 19
26	1 19	3 16	3 07	4 34	5 08	6 36	6 48	7 11	7 50	8 32	10 35	11 16
27	2 17	4 15	4 02	5 26	6 03	7 24	7 26	7 47	8 43	9 38	11 34	12 10
28	3 20	5 13	4 54	6 19	6 57	8 09	8 02	8 26	9 40	10 42	12 30	13 04
29	4 23	6 08	5 46	7 13	7 50	8 50	8 37	9 08	10 43	11 45	13 24	13 57
30	5 25		6 39	8 08	8 41	9 27	9 12	9 54	11 46	12 44	14 17	14 51
31	6 25		7 32		9 27		9 47	10 48		13 41		15 45

ECLIPSES

During 1972 there will be four eclipses, two of the Sun and two of the Moon, but none will be visible from Southern Africa.

Annular eclipse of the Sun, January 16 - visible from Antartica. Limit of partial eclipse is south east of South African coastline.

Total eclipse of the Moon, January 30 - visible from the Americas, Asia and Australia.

Total eclipse of the Sun, July 10 - path crosses northern Canada.

Partial eclipse of the Moon, July 26 - visible from the Americas and Australia.

COMETS

No bright naked-eye comets are predicted for 1972, but this does not rule out the possibility of such objects appearing, such as Comet Bennett in 1970. Comets are generally discovered by amateurs scanning the skies after sunset or before dawn (the latter is preferable!) and a comet observing section exists within the Society. Interested persons should write to Mr. J. C. Bennett, 90 Malan Street, Riviera, Pretoria.

METEORS

Meteors, or shooting stars, (resulting from small bodies entering the Earth's upper atmosphere) are generally seen in greater abundance after midnight (due to the direction of the Earth's motion) than in the early evening. There are two categories of meteors - the sporadic ones, and the showers. A meteor shower comes from a certain direction in space (the Radiant) and is thought to be associated with the remains of a comet. When the Earth passes close to the comet's original orbit, a shower can be expected. A list of these predicted showers is given in the table opposite.

Date	Shower	Radiant: R.A.	Dec.	Maximum Date	Hourly Rate	Transit of Radiant (approx)	Recommended SAST of watch	Conditions at Maximum
Mar 14 -Mar 18	Corona Australids	$16^h\ 20^m$	-48°	Mar 16	5	$04^h\ 45^m$	02h - dawn	Favourable
Mar 12 -Apr 25	Hydraids	12 16	-27	Mar 25	?	00 10	22h - 02h	Unfavourable
Apr 19 -Apr 24	April Lyrids	18 08	+32	Apr 21	14	04 15	00h - 02h	Favourable
May 1 -May 8	Eta Aquarids	22 24	00	May 5	18	07 30	03h - dawn	Unfavourable
Apr 20 -Jul 30	Sco - Sgr System	18 00	-30	Jun 14	?	00 30	20h - 24h	Favourable
Jun 10 -Jun 21	June Lyrids	18 32	+35	Jun 16	9	01 00	22h - 24h	Favourable
Jun 17 -Jun 26	Ophiuchids	17 20	-20	Jun 20	15	23 30	01h - 03h	Favourable
Jul 10 -Aug 5	Capricornids	21 00	-15	Jul 25	12	00 50	22h - 02h	Unfavourable
Jul 15 -Aug 15	Delta Aquarids	22 36	-17 00	Jul 29	35	02 10	00h - 04h	Unfavourable
Jul 15 -Aug 20	Pisces Australids	22 40	-30	Jul 30	15	02 10	00h - 04h	Unfavourable
Jul 15 -Aug 25	Alpha Capricornids	20 36	-10	Aug 1	10	00 00	02h - 04h	Unfavourable
Jul 15 -Aug 24	Iota Aquarids	22 04 22 32	- 6 -15	Aug 5	12	01 10 01 40	00h - 03h	Favourable
Oct 16 -Oct 27	Orionids	06 24	+15	Oct 21	35	04 30	02h - dawn	Unfavourable
Oct 10 -Dec 5	Taurids	03 28 03 36	+14 +21	Nov 1	16	00 50 01 00	23h - 02h	Favourable
Nov 14 -Nov 20	Leonids	10 08	+22	Nov 17	80?	06 30	02h - dawn	Favourable
Dec 5	Phoenicids	01 00	-55	Dec 5	?	20 10	19h - 24h	Favourable
Dec 7 -Dec 15	Geminids	07 28	+32	Dec 13	55	02 00	00h - 03h	Favourable
Dec 5 -Jan 7	Velaids	09 56	-51	Dec 29	?	03 30	23h - 03h30m	Unfavourable

THE PLANETS

Notes on visibility and observing of individual planets follow in the text below. Times of rising and setting are given by the diagrams on pages 18 and 19. Movements of the planets against the starry background are shown in the maps on pages 20 and 21.

MERCURY

Being close to the Sun, Mercury can only be seen just after sunset, or just before sunrise, when it is near greatest elongation (greatest angle between Mercury and Sun - as seen from the Earth). The only periods when it is visible in the early

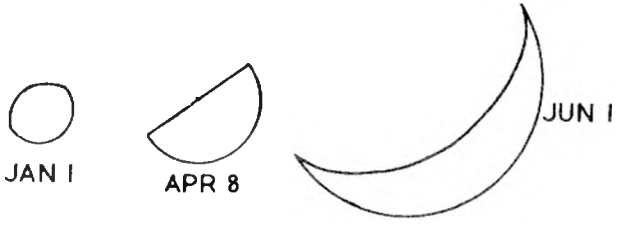
THE PLANETS - BASIC DATA

	Dist from Sun	Period of Revolution	Mass	Diameter	Rotation Period	Inclination of Equator to Orbit
	10^6 km	years	(Earth = 1)	10^3 km		
Mercury	58	0.24	0.056	4.98	59d	?
Venus	108	0.62	0.817	12.4	?	?
Earth	150	1.00	1.000	12.8	23^h56^m	23°27'
Mars	228	1.88	0.108	6.76	24 37	23 59
Jupiter	778	11.9	318.0	142.7	09 51	03 04
Saturn	1426	29.5	95.2	120.8	10 14	26 44
Uranus	2868	84.0	14.6	47.1	10 49	97 53
Neptune	4494	164.8	17.3	44.6	14 ?	28 48
Pluto	5896	247.6	0.9?	?	?	?

evening are early March (very unfavourable), July (in the constellation of Cancer - and passing very close to Mars on June 28) and late October - early November (in Scorpius and passing close to Antares on November 8). It may be glimpsed in the morning sky in January, late April - early May, late August (very unfavourable) and December. On two occasions in 1972, Mercury is obscured by the disk of the Moon, but neither of these occultations is visible from Southern Africa. The angular diameter of Mercury's disk rarely exceeds 10 seconds of arc (about 1/200 of the Moon's angular diameter), so it is difficult to make out much detail with a small telescope, but phases (like those of the Moon) might just be visible.

VENUS

Venus is a conspicuous object in the evening sky until early June. Greatest elongation (greatest angle from Sun) occurs on April 8, and greatest brilliancy (magnitude -4.2) on May 11. If observed through a telescope over this period, its phase is seen to change from gibbous to a waning crescent as it draws closer to the Earth (angular diameter approaches 30 seconds of arc in June). Virtually no details can be seen on the disk of the planet because of the dense cloud covering. On June 17 it passes between the Earth and the Sun (inferior conjunction) and thereafter is seen in the morning sky for the rest of the year. Venus is occulted by the Moon on April 17 but this event is regrettably not visible from Southern Africa.

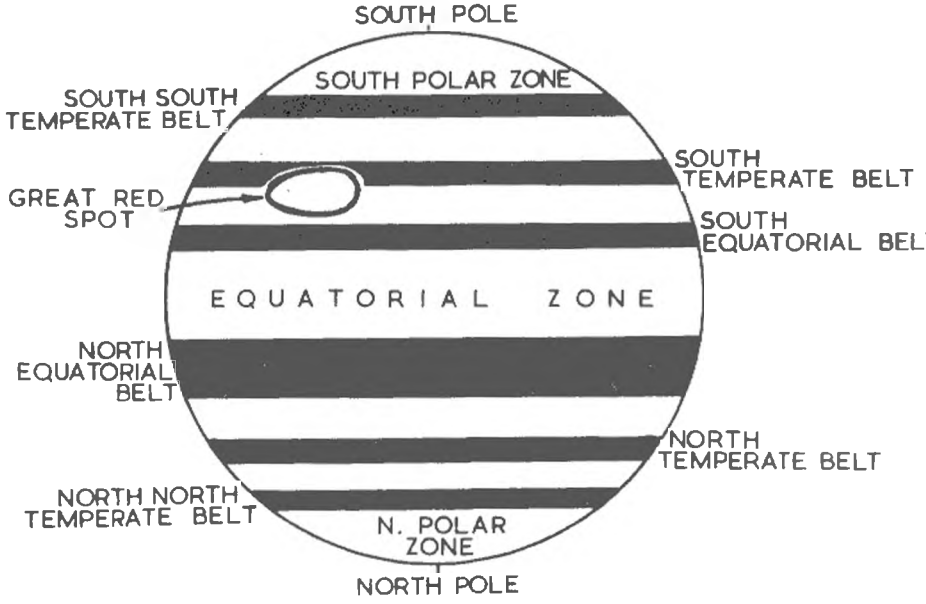


MARS

A spectacular close opposition of Mars occurred in August 1971. As it will be over two years before the next time of opposition (closest to Earth), 1972 will be a disappointing year for observing the red planet. Mars is seen in the evening sky until September when it passes round the far side of the Sun to reappear in the morning sky.

JUPITER

Jupiter, seen against the stars of Sagittarius, is a prominent evening sky object over the period May to November. It is at its brightest (magnitude -2.2) at opposition on June 24. Because of its large angular size (44 seconds of arc at opposition), Jupiter makes an excellent object for a small telescope. It is often possible to see features on the disk: dark and light cloud bands, running parallel to the equator, and spots, in particular the famous Great Red Spot. These are indicated in the diagram below. The Great Red Spot is not always visible because of the rotation of the planet.



Also clearly visible are four of Jupiter's twelve Moons. An entire section of this Handbook is devoted to the movements of these satellites and the phenomena associated with them (see page 23).

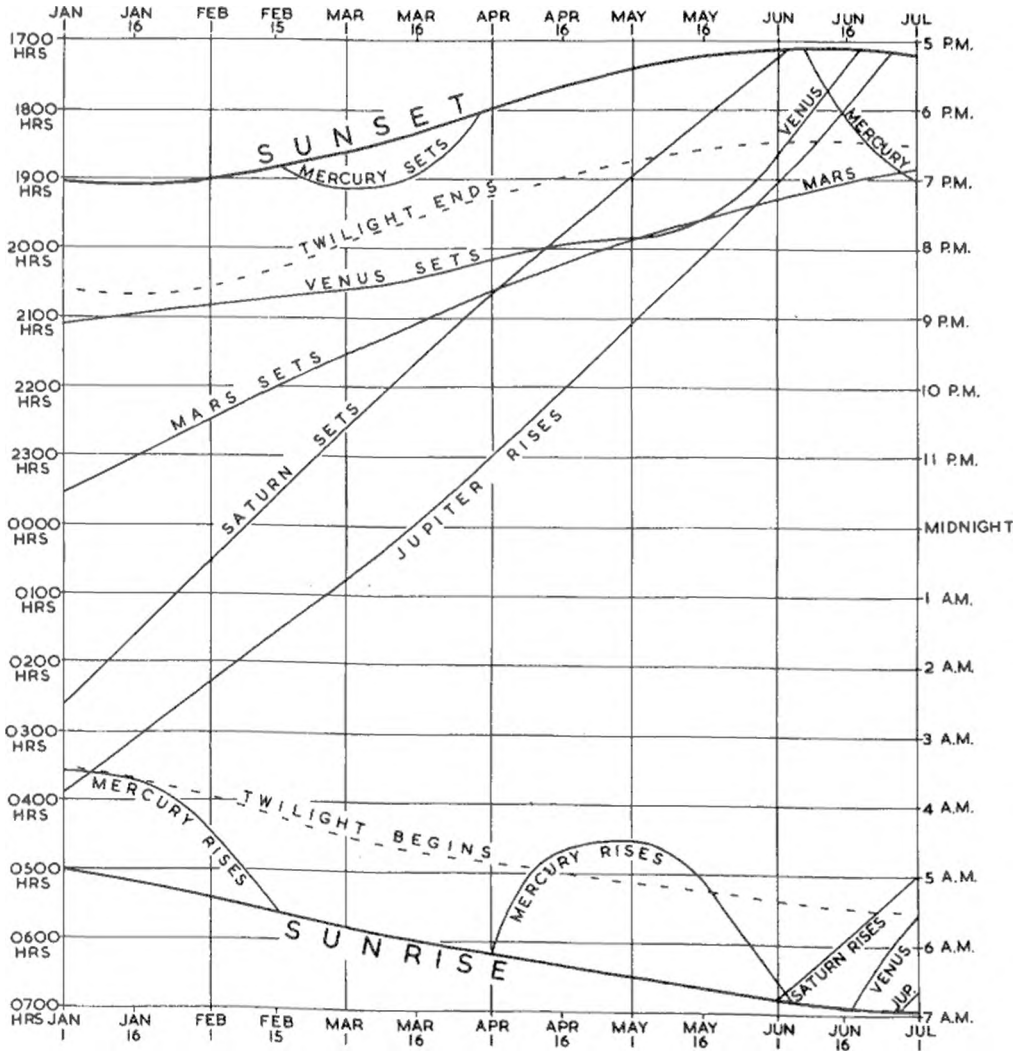
SATURN

Saturn, in the constellation of Taurus, is visible in the evening sky of the summer months at the beginning and end of the year. It is at greatest brightness (magnitude -0.3) at opposition on December 9. It is also a spectacular object when viewed through a telescope, the angular diameter of the rings being 47 seconds of arc at

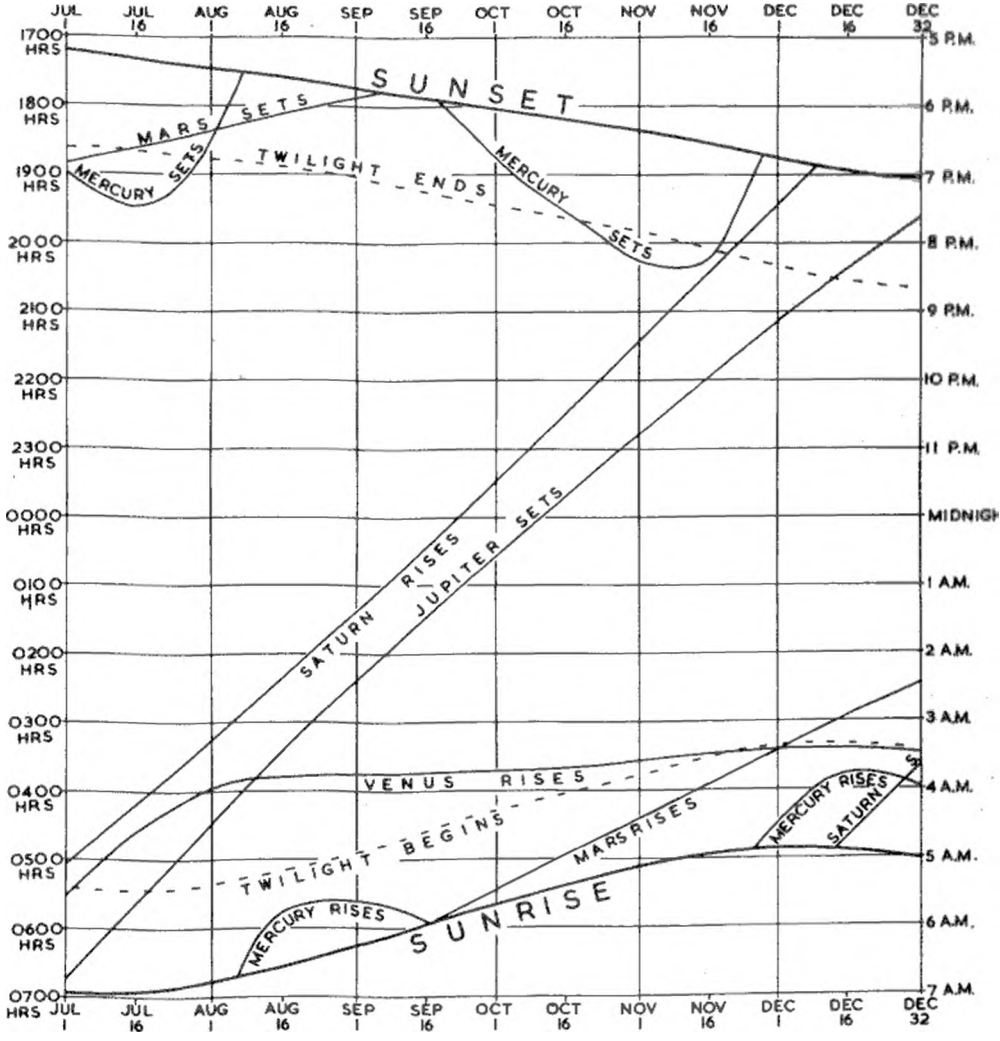
(text continued on page 22)

THE PLANETS - TIMES OF RISING AND SETTING 1972

To find the times of rising and setting of the planets for any particular night of the year, place a ruler (or suitable edge) vertically on the diagram according to the date given by the horizontal scale. The intersection of the ruler with the lines of rising and setting then give the appropriate times which can be read off against the vertical scale (24 hour clock on the left hand side, or conventional 12 hour clock on the right hand side).



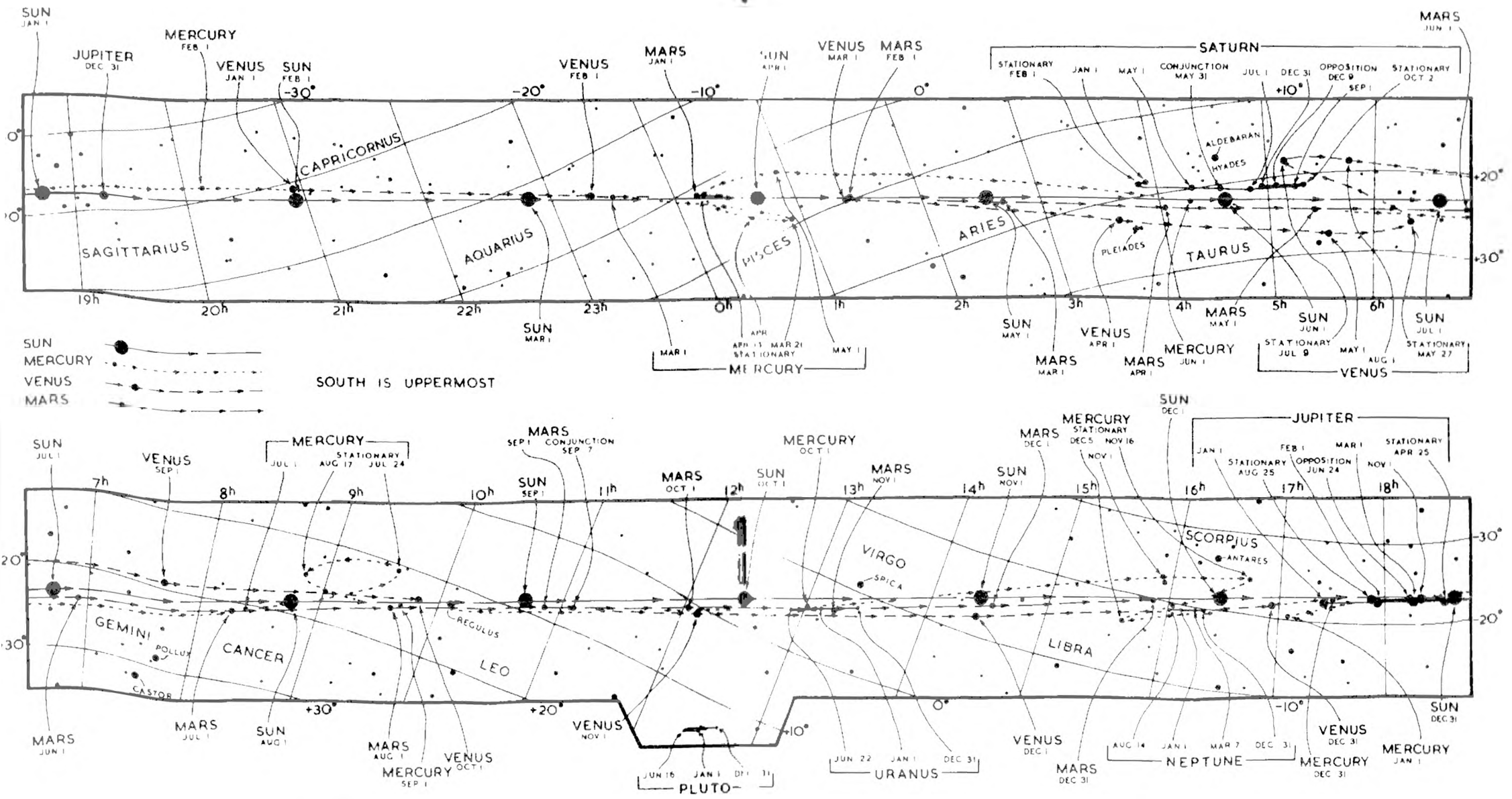
The times of rising and setting given by this diagram are accurate for position 30° East, 30° South, and approximately correct for other places in Southern Africa. Strictly speaking, corrections for latitude and longitude should be applied, but the latitude correction is, in general, sufficiently small to be ignored and in no case will exceed 15 minutes. Longitude corrections (in minutes) for the main cities are: Bloemfontein +15^{m}; Bulawayo^{m} +6^{m}; Cape Town +46^{m}; Durban -4^{m}; East London +8^{m}; Grahamstown +14^{m}; Johannesburg +8^{m}; Kimberley +21^{m}; Port Elizabeth +18^{m}; Pretoria +7^{m}; Salisbury - 4^{m}; Windhoek +52^{m}.



THE PLANETS - MOVEMENT IN THE CONSTELLATIONS 1972

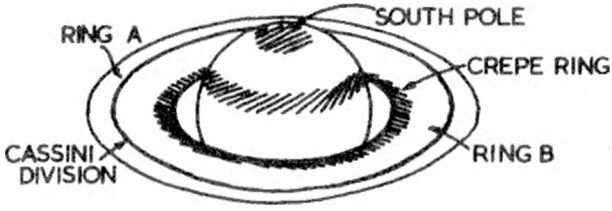
The two continuous strip maps below show that band of the sky known as the Zodiac, one half of which could be above the horizon at any time. The central axis, called the "ecliptic", is the apparent path of the Sun around the sky during the course of the year (resulting from the Earth revolving once around the Sun). The Sun's position on the first of each month is shown — that portion of the Zodiac to the right of the Sun would be seen after sunset, that portion to the left of the Sun before dawn.

As a result of the planets' own motions and the Earth's motion, the planets appear to move against the starry background. Due to the flatness of our solar system, they are never far away from the ecliptic (representing the plane of the Earth's orbit) and consequently confined to the constellations of the Zodiac. The diagram shows their movements relative to these constellations and against the coordinate grid of Right Ascension and Declination (for explanation see section on Stars). Note that South is uppermost.



(continued from page 17)

opposition. As the diagram shows, during 1972, the ring system is tilted sufficiently to cover most of the northern hemisphere of the planet - the south pole is clearly visible.



URANUS

At opposition, on April 6, Uranus is on the borderline of naked eye visibility (magnitude 5.5). It can however be found fairly easily with a small telescope, equipped with setting circles, by using the ephemerides given in the table below. The disk subtends an angle of about 4 seconds of arc.

EPHEMERIDES FOR URANUS AND NEPTUNE

	URANUS		NEPTUNE	
	R.A.	Dec.	R.A.	Dec.
	h m		h m	
Jan 1	13 07.7	- 6° 29'	16 09.7	- 19° 24'
21	13 08.6	- 6 34	16 12.1	- 19 29
Feb 10	13 08.1	- 6 30	16 13.8	- 19 32
Mar 1	13 06.3	- 6 19	16 14.5	- 19 33
21	13 03.6	- 6 02	16 14.4	- 19 32
Apr 10	13 00.5	- 5 42	16 13.3	- 19 28
30	12 57.4	- 5 24	16 11.6	- 19 23
May 20	12 55.0	- 5 09	16 09.5	- 19 17
Jun 9	12 53.5	- 5 01	16 07.2	- 19 12
29	12 53.4	- 5 00	16 05.3	- 19 07
Jul 19	12 54.4	- 5 08	16 03.8	- 19 04
Aug 8	12 56.8	- 5 23	16 03.1	- 19 03
28	13 00.1	- 5 45	16 03.2	- 19 04
Sep 17	13 04.2	- 6 11	16 04.3	- 19 08
Oct 7	13 08.8	- 6 39	16 06.2	- 19 15
27	13 13.5	- 7 08	16 08.7	- 19 22
Nov 16	13 17.9	- 7 34	16 11.6	- 19 30
Dec 6	13 21.7	- 7 57	16 14.8	- 19 39
26	13 24.5	- 8 13	16 17.8	- 19 46

For explanation of coordinates, see section on Stars.

NEPTUNE

Neptune is at opposition on May 25 (magnitude 7.7). Like Uranus, it requires a telescope for observation; its position being given in the accompaying table. Although the disk has a diameter of only 2.5 seconds of arc, its non-stellar appearance aids in identification.

PLUTO

Pluto can only be found by using a large telescope and specially prepared finding charts.

THE MOONS OF JUPITER

One of the most popular sights for the amateur astronomer with a small telescope is the planet Jupiter. Four of Jupiter's twelve moons are generally clearly visible. The system is seen near edge-on and consequently the moons appear to lie close to a straight line extending from the planet's equator. As they orbit the mother planet, they appear to oscillate from one side to the other, alternately passing in front of, and behind, the planet. This motion is represented on the diagrams overleaf, which cover the eight months when Jupiter is prominent in the evening sky. The horizontal displacements show their relative positions on either side of the planet. The vertical axis is time; the planet's disk is represented by the central column. The horizontal lines are given for 0200 hrs SAST (0 hrs Universal Time) each day. The scales on either side mark the position at approximately 9.30 p.m., a likely time for any evening observation. A ruler placed across the diagram then shows the configuration of the four moons (the points where their paths intersect the ruler's edge).

During the course of the passing of these satellites in front of, and behind, the planet, numerous eclipses, occultations and transits occur. Details of phenomena occurring between the end of Astronomical Twilight and Midnight, and when the planet is above the horizon in Southern Africa, are tabulated on pages 26 and 27. The predicted times are for mid-phenomena and are not instantaneous.

Explanation of Table:

The date and time of the phenomenon are given.

Sat. – is the satellite concerned: I – Io III – Ganymede
II – Europa IV – Callisto

Phen. – is the particular phenomenon. The first column gives the type.

Ec. – Eclipse: the satellite passes through the shadow of Jupiter.

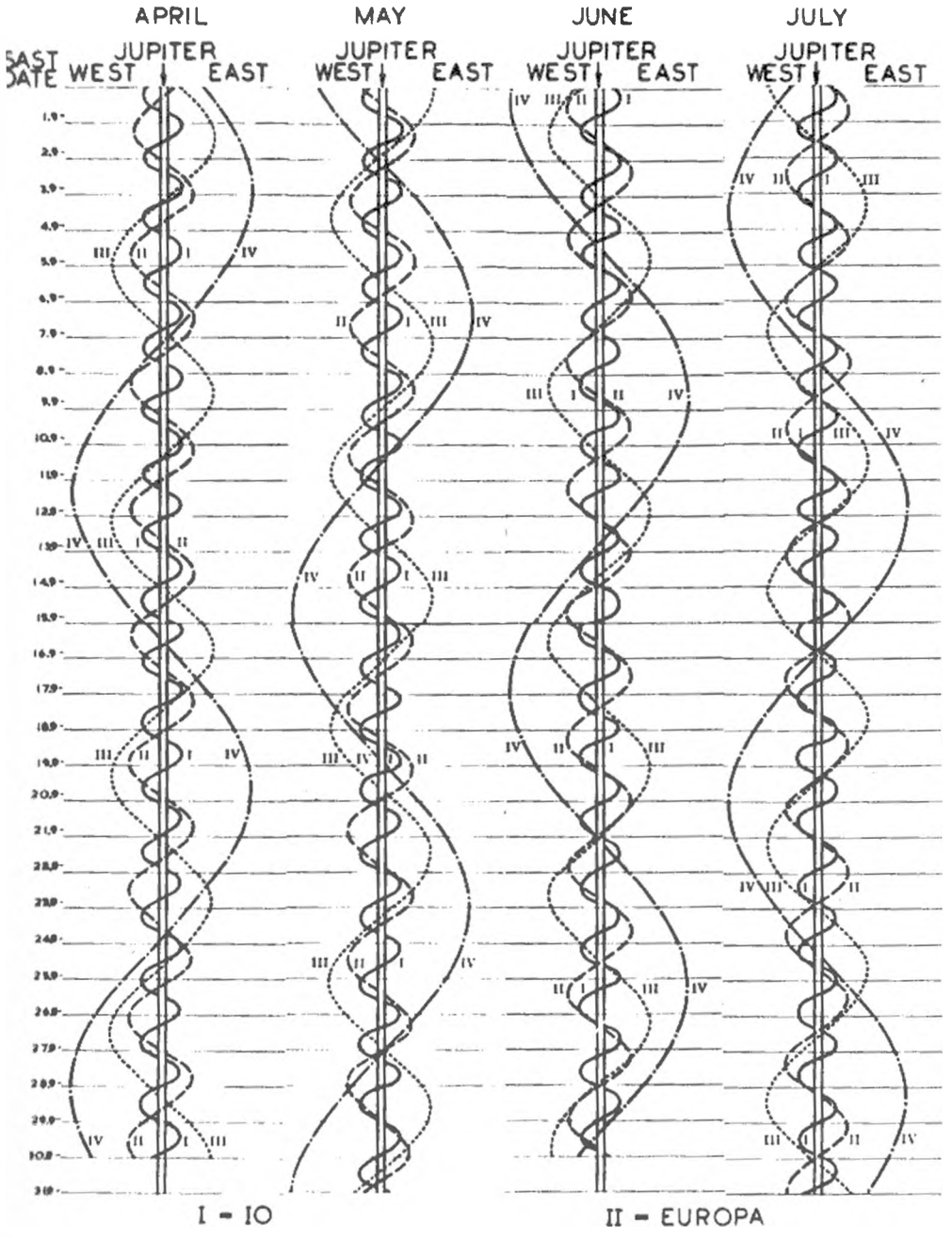
Oc. – Occultation: the satellite is obscured by the disc of Jupiter.

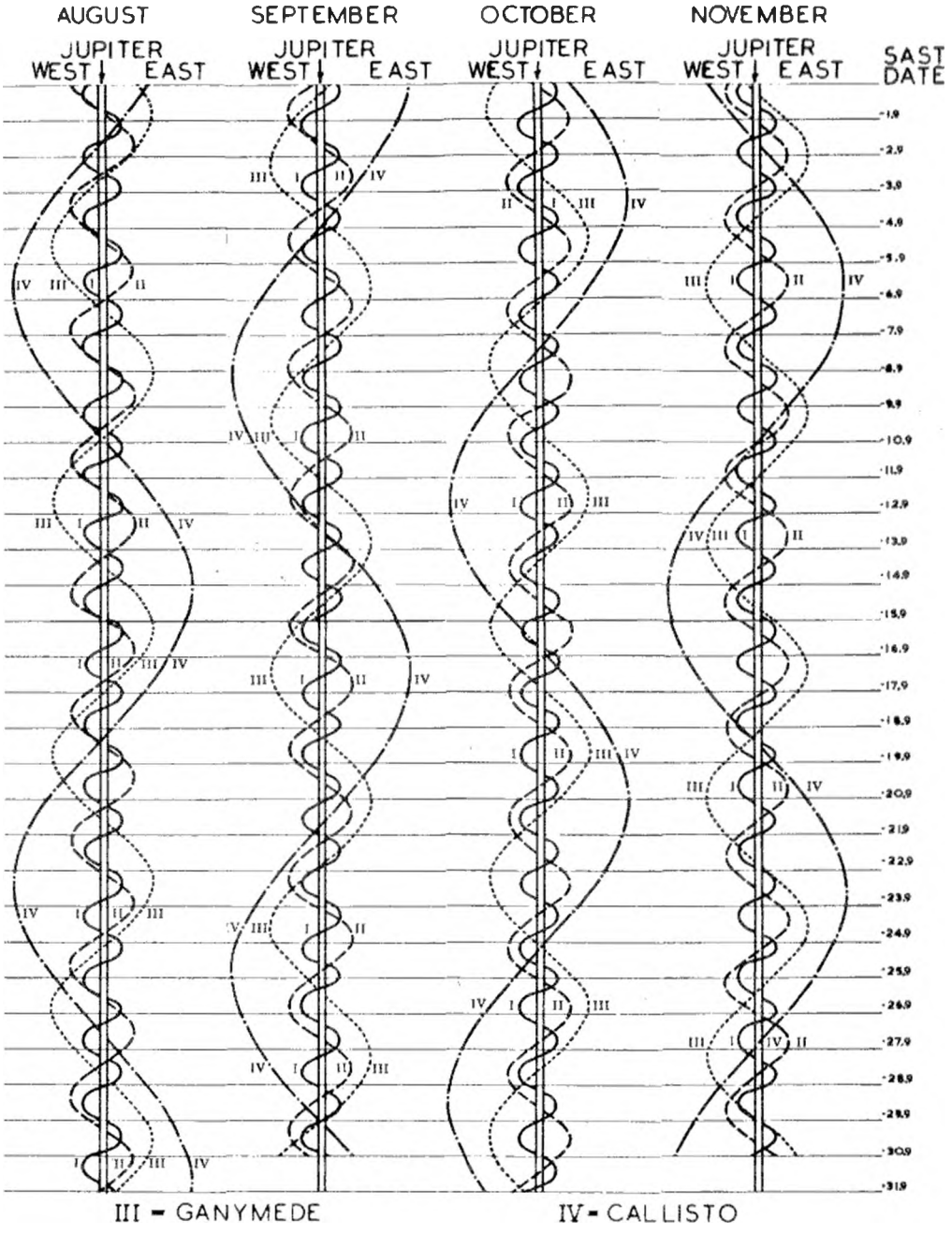
Tr. – Transit: the satellite crosses the disc of Jupiter.

Sh. – Shadow transit: the shadow of the satellite transits the disc.

The second column gives the phase of the phenomenon.

D – Disappearance R – Reappearance
I – Ingress E – Egress


APRIL
MAY
JUNE
JULY
JUPITER
WEST
EAST
I - IO
II - EUROPA


AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
JUPITER
WEST
EAST
SAST
DATE
1.9
2.9
3.9
4.9
5.9
6.9
7.9
8.9
9.9
10.9
11.9
12.9
13.9
14.9
15.9
16.9
17.9
18.9
19.9
20.9
21.9
22.9
23.9
24.9
25.9
26.9
27.9
28.9
29.9
30.9
31.9
III = GANYMEDE
IV = CALLISTO

Date	S.A.S.T.	Sat	Phen
Mar 22	23h 42m	I	Sh E
29	23 23	I	Sh I
Apr 7	23 13	I	Tr E
7	23 37	III	Oc R
14	22 52	I	Tr I
14	23 51	I	Sh E
15	22 25	I	Oc R
20	23 56	II	Oc R
21	23 27	III	Ec D
21	23 32	I	Sh I
23	21 23	I	Tr E
25	21 05	III	Tr E
27	21 19	II	Ec D
29	21 18	II	Tr E
29	22 44	I	Ec D
30	20 59	I	Tr I
30	22 07	I	Sh E
30	23 12	I	Tr E
May 2	21 47	III	Tr I
4	23 55	II	Ec D
6	21 00	II	Tr I
6	21 40	II	Sh E
6	23 41	II	Tr E
7	21 47	I	Sh I
7	22 47	I	Tr I
8	22 18	I	Oc R
9	21 26	III	Sh I
13	21 33	II	Sh I
13	23 21	II	Tr I
14	23 41	I	Sh I
15	20 24	II	Oc R
15	20 59	I	Ec D
16	20 23	I	Sh E
16	21 15	I	Tr E

Date	S.A.S.T.	Sat	Phen
May 20	21h 31m	III	Oc R
22	22 44	II	Oc R
22	22 53	I	Ec D
23	20 03	I	Sh I
23	20 47	I	Tr I
23	22 17	I	Sh E
23	23 01	I	Tr E
24	20 17	I	Oc R
27	19 17	III	Ec D
29	21 01	II	Ec D
30	21 57	I	Sh I
30	22 32	I	Tr I
31	19 15	I	Ec D
31	19 46	II	Tr E
31	22 02	I	Oc R
Jun 1	19 13	I	Tr E
3	23 15	III	Ec D
5	23 37	II	Ec D
6	23 51	I	Sh I
7	18 31	II	Sh I
7	19 20	II	Tr I
7	21 08	I	Ec D
7	21 13	II	Sh E
7	22 01	II	Tr E
7	23 46	I	Oc R
8	18 43	I	Tr I
8	20 34	I	Sh E
8	20 58	I	Tr E
14	18 20	III	Tr I
14	20 18	III	Sh E
14	21 05	II	Sh I
14	21 18	III	Tr E
14	21 34	II	Tr I
14	23 02	I	Ec D

Date	S.A.S.T.	Sat	Phen
Jun 14	23h 46m	II	Sh E
15	20 14	I	Sh I
15	20 27	I	Tr I
15	22 29	I	Sh E
15	22 42	I	Tr E
16	18 46	II	Oc R
16	19 55	I	Oc R
21	21 17	III	Sh I
21	21 36	III	Tr I
21	23 39	II	Sh I
21	23 47	II	Tr I
22	22 08	I	Sh I
22	22 11	I	Tr I
23	18 10	II	Ec D
23	19 24	I	Ec D
23	21 01	II	Oc R
23	21 39	I	Oc R
24	18 52	I	Tr E
24	18 52	I	Sh E
29	23 55	I	Tr I
30	20 29	II	Oc D
30	21 10	I	Oc D
30	23 31	I	Ec R
30	23 36	II	Ec R
Jul 1	18 31	I	Sh I
1	20 36	I	Tr E
1	20 47	I	Sh E
7	22 45	II	Oc D
7	22 54	I	Oc D
8	20 06	I	Tr I
8	20 26	I	Sh I
8	21 49	IV	Ec D
8	22 21	I	Tr E
8	22 41	I	Sh E

Date	S.A.S.T.	Sat	Phen
Jul 8	22h 52m	IV	Ec R
9	19 54	I	Ec R
9	20 03	II	Tr E
9	20 46	II	Sh E
9	22 13	III	Ec R
15	21 51	I	Tr I
15	22 21	I	Sh I
16	19 04	I	Oc D
16	19 37	II	Tr I
16	20 38	II	Sh I
16	21 02	III	Oc D
16	21 49	I	Ec R
16	22 18	II	Tr E
16	23 20	II	Sh E
17	18 32	I	Tr E
17	19 05	I	Sh E
22	23 37	I	Tr I
23	20 50	I	Oc D
23	21 53	II	Tr I
23	23 13	II	Sh I
23	23 43	I	Ec R
24	18 45	I	Sh I
24	20 18	I	Tr E
24	21 00	I	Sh E
25	20 46	II	Ec R
27	20 19	III	Sh E
30	22 36	I	Oc D
31	19 51	I	Tr I
31	20 40	I	Sh I
31	22 05	I	Tr E
31	22 55	I	Sh I
Aug 1	18 51	II	Oc D
1	20 06	I	Ec R
1	23 24	II	Ec R

Date	S.A.S.T.	Sat	Phen
Aug 2	23h 13m	IV	Sh I
3	20 42	III	Tr E
3	21 14	III	Sh I
7	21 39	I	Tr I
7	22 35	I	Sh I
7	23 53	I	Tr E
8	18 50	I	Oc D
8	21 14	II	Oc D
8	22 01	I	Ec R
9	19 19	I	Sh E
10	20 22	II	Sh E
10	21 13	III	Tr I
14	23 28	I	Tr I
15	20 38	I	Oc D
15	23 39	II	Oc D
15	23 56	I	Ec R
16	19 00	I	Sh I
16	20 09	I	Tr E
16	21 14	I	Sh E
17	20 14	II	Sh I
17	20 48	II	Tr E
17	22 57	II	Sh E
21	19 05	III	Ec D
21	22 14	III	Ec R
22	22 28	I	Oc D
23	19 46	I	Tr I
23	20 55	I	Sh I
23	22 00	I	Tr E
23	23 09	I	Sh E
24	20 20	I	Ec R
24	20 32	II	Tr I
24	22 49	II	Sh I
24	23 13	II	Tr E
26	20 36	II	Ec R

Date	S.A.S.T.	Sat	Phen
Aug 28	21h 18m	III	Oc R
28	23 05	III	Ec D
30	21 37	I	Tr I
30	22 50	I	Sh I
30	23 51	I	Tr E
31	22 15	I	Ec R
31	23 00	II	Tr I
Sep 1	19 34	I	Sh E
2	23 14	II	Ec R
4	22 01	III	Oc D
4	23 42	IV	Tr I
6	23 30	I	Tr I
7	20 39	I	Oc D
8	19 15	I	Sh I
8	20 13	I	Tr E
8	20 23	III	Sh E
8	21 29	I	Sh E
9	20 26	II	Oc D
11	20 02	II	Sh E
13	21 31	IV	Ec D
13	23 52	IV	Ec R
14	22 33	I	Oc D
15	19 53	I	Tr I
15	21 10	I	Sh I
15	21 14	III	Sh I
15	22 07	I	Tr E
15	23 24	I	Sh E
16	20 34	I	Ec R
16	23 01	II	Oc D
18	19 54	II	Sh I
18	20 02	II	Tr E
18	22 38	II	Sh E
22	20 00	III	Tr I
22	21 48	I	Tr I

Date	S.A.S.T.	Sat	Phen
Sep 22	23h 04m	III	Tr E
22	23 06	I	Sh I
23	22 29	I	Ec R
24	19 49	I	Sh E
25	19 55	II	Tr I
25	22 29	II	Sh I
25	22 38	II	Tr E
27	20 24	II	Ec R
29	23 44	I	Tr I
30	20 52	I	Oc D
Oct 1	19 30	I	Sh I
1	20 27	I	Tr E
1	21 44	I	Sh E
2	22 33	II	Tr I
3	22 18	III	Ec R
4	23 01	II	Ec R
7	22 49	I	Oc D
8	20 10	I	Tr I
8	21 25	I	Sh I
8	22 24	I	Tr E
8	23 05	IV	Sh I
8	23 39	I	Sh E
9	20 48	I	Ec R
10	21 11	III	Oc R
10	23 05	III	Ec D
11	20 19	II	Oc D
13	19 46	II	Sh E
15	22 08	I	Tr I
15	23 21	I	Sh I
16	22 28	IV	Oc D
16	22 44	I	Ec R
17	20 04	I	Sh E
17	22 14	III	Oc D
18	23 02	II	Oc D

Date	S.A.S.T.	Sat	Phen
Oct 20	19h 36m	II	Sh I
20	20 00	II	Tr E
20	22 23	II	Sh E
21	20 28	III	Sh E
23	21 14	I	Oc D
24	19 45	I	Sh I
24	20 51	I	Tr E
24	21 59	I	Sh E
25	19 49	IV	Sh E
27	19 59	II	Tr I
27	22 12	II	Sh I
27	22 45	II	Tr E
28	19 57	III	Tr E
28	21 15	III	Sh I
29	20 10	II	Ec R
31	20 36	I	Tr I
31	21 40	I	Sh I
Nov 1	21 03	I	Ec R
2	20 14	IV	Oc R
4	21 07	III	Tr I
9	20 18	I	Sh E
12	20 42	II	Oc D
15	21 44	I	Oc D
16	21 21	I	Tr E
19	21 31	IV	Ec D
21	20 31	II	Tr E
23	21 07	I	Tr I
28	20 32	II	Tr I
Dec 1	20 16	I	Oc D
2	20 32	I	Sh E
3	20 32	III	Sh E

THE STARS

Sidereal time, or effectively "star time", is given by the rotation of the Earth with respect to the stars - instead of the Sun - and can serve to indicate what portion of the heavens is visible at any particular time. The table below gives Sidereal time (for longitude 30° E) at 0hrs SAST (midnight) and 2100hrs (9 p.m.). It is tabulated at 10 day intervals. For intermediate dates, a difference of 4 minutes a day needs to be taken into account (24 hours of sidereal time are 4 minutes shorter than 24 hours of standard time).

Date 1972	At 0 hrs S.A.S.T.	At 21 hrs S.A.S.T.
Jan 1	$6^h\ 39^m$	$3^h\ 42^m$
11	7 18	4 21
21	7 58	5 01
31	8 37	5 40
Feb 10	9 16	6 20
20	9 56	6 59
Mar 1	10 35	7 38
11	11 15	8 18
21	11 54	8 57
31	12 34	9 37
Apr 10	13 13	10 16
20	13 52	10 55
30	14 32	11 35

Date 1972	At 0 hrs S.A.S.T.	At 21 hrs S.A.S.T.
May 10	$15^h\ 11^m$	$12^h\ 14^m$
20	15 51	12 54
30	16 30	13 33
Jun 9	17 10	14 13
19	17 49	14 52
29	18 28	15 31
Jul 9	19 08	16 11
19	19 47	16 50
29	20 27	17 30
Aug 8	21 06	18 09
18	21 45	18 49
28	22 25	19 28
Sep 7	23 04	20 07

Date 1972	At 0 hrs S.A.S.T.	At 21 hrs S.A.S.T.
Sep 17	$23^h\ 44^m$	$20^h\ 47^m$
27	0 23	21 26
Oct 7	1 03	22 06
17	1 42	22 45
27	2 21	23 25
Nov 6	3 01	0 04
16	3 40	0 43
26	4 20	1 23
Dec 6	4 59	2 02
16	5 39	2 42
26	6 18	3 21

The local Sidereal time, for places not on Longitude 30° east, can be found by applying the longitude difference expressed in minutes of time. This correction is given here for the chief cities of Southern Africa.

Bloemfontein	-15^m	Johannesburg	-08^m
Bulawayo	-06	Kimberley	-21
Cape Town	-46	Port Elizabeth	-18
Durban	+04	Pretoria	-07
East London	-08	Salisbury	+04
Grahamstown	-14	Windhoek	-52

The Sidereal time at times other than 0hrs and 2100hrs SAST can be found by adding the elapsed time, plus an extra minute for each six hour interval.

Example: Find the sidereal time at 11.30 p.m. on January 3rd at Pretoria — 3 30

From table — Sidereal time at 2100 hrs (9 p.m.) on Jan 1 = — $3^h\ 42^m$

Sidereal time at 2100 hrs (9 p.m.) on Jan 3, two days later, is found by adding two times 4 minutes per day, i.e. adding 8 minutes = — 3 50

Now correct for longitude (from table — Pretoria: -07^m) = — 3 43

To find Sidereal time at 11.30 p.m. add $2^h\ 30^m$ elapsed time (no extra minute per six hour interval of elapsed time need be added in this case) = — 6 13

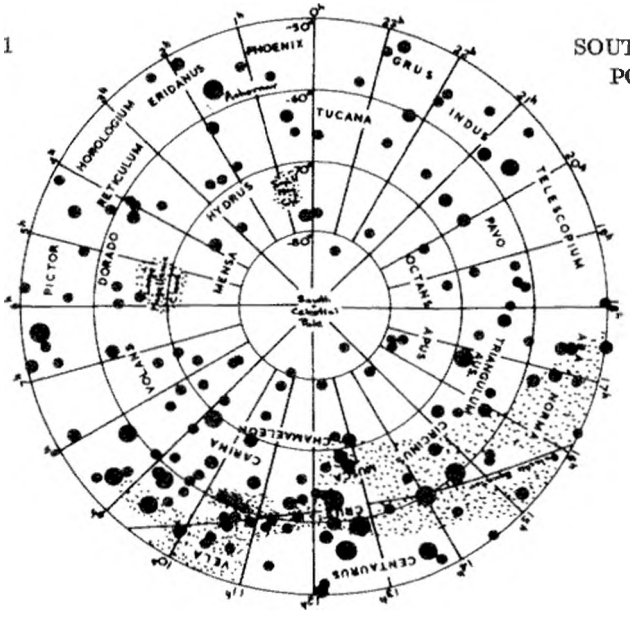
Required sidereal time $6^h\ 13^m$.

Explanation to Star Maps

The complete sky can be represented by a sphere (the Celestial Sphere) viewed from the inside, one half of which is visible at any particular time to an observer with a flat horizon. The position of a star on this sphere is given by two coordinates that correspond to latitude and longitude on Earth. That equivalent to latitude is Declination, measured from +90° (at the North Celestial Pole) through 0° (the Celestial Equator) to -90° (at the South Celestial Pole). Right Ascension, corresponding to longitude, is measured eastwards in units of time - 24 hours being equal to 360°.

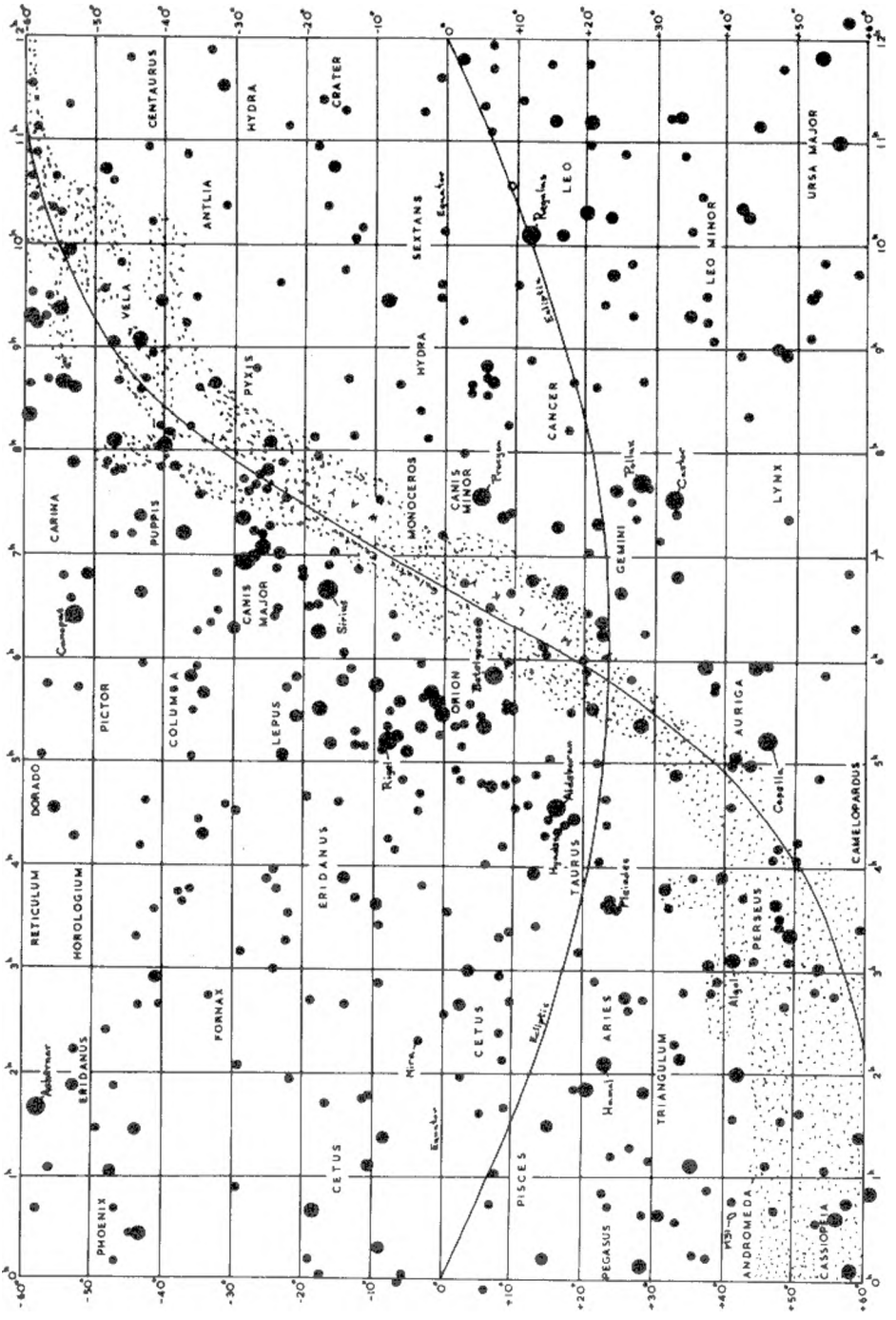
The first of the star maps shows the region of the sky in the vicinity of the South Celestial Pole. The two remaining maps have the Celestial Equator as their central axis and, like maps of the Earth with the equator as their central axis, must unavoidably show some distortion towards the top and bottom edges. The apparent path of the Sun around the Earth, the Ecliptic, is also shown; one of the points where it cuts the Celestial Equator serves as the zero point for the Right Ascension scale. [An earlier map showing the movements of the planets (page 20) represents the Ecliptic as a straight line and the Celestial Equator as a curve.] No map of the region of sky adjacent to the North Celestial Pole is provided as this area is not visible from Southern Africa.

STAR MAP 1 — SOUTH CELESTIAL POLE REGION

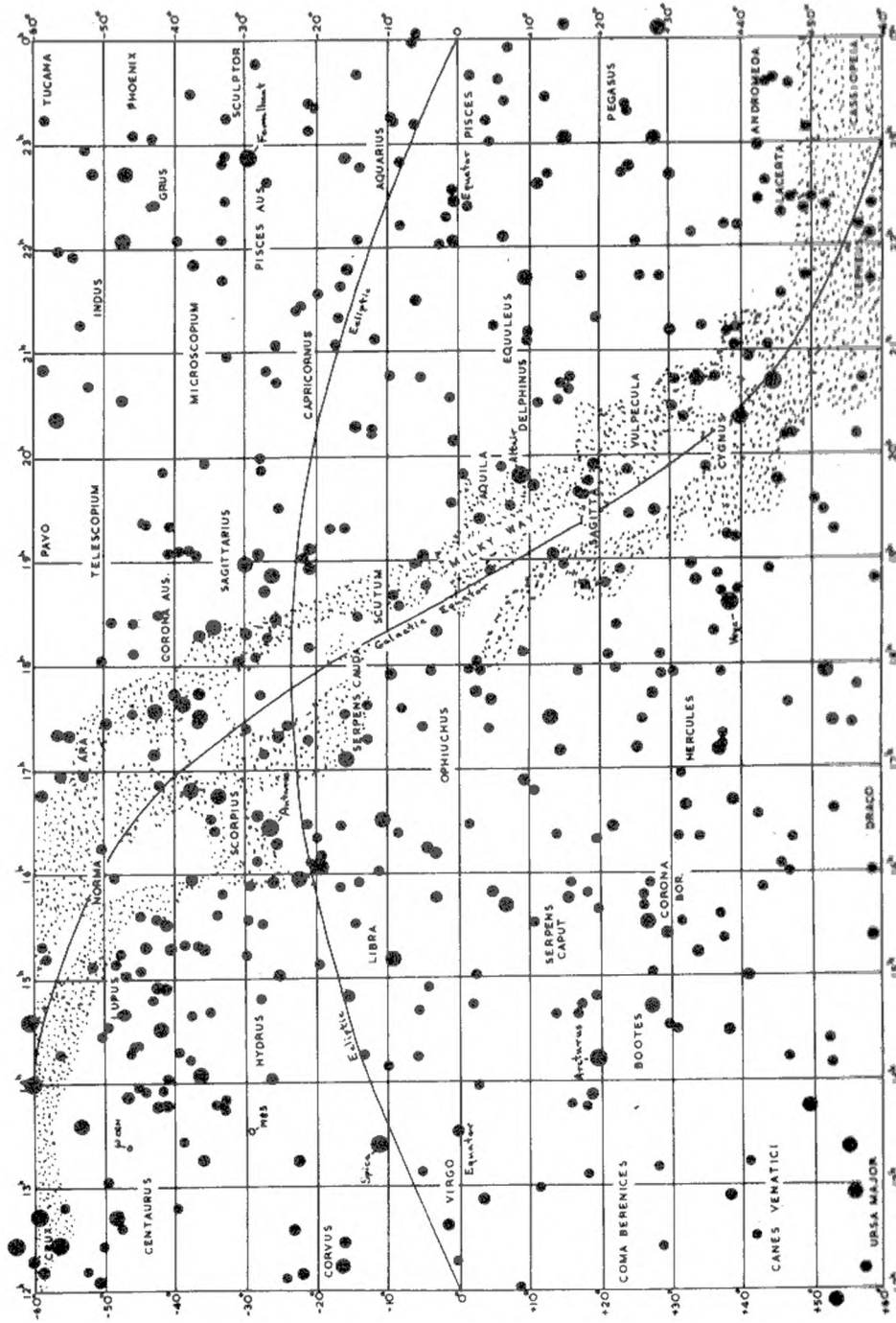


The South Celestial Pole is elevated above the south point of the horizon by an angle equal to the observer's southern latitude (e.g. 10° for Salisbury, 26° for Johannesburg, and 34° for Cape Town). The line from the Southern Celestial Pole through the overhead point and down to the north point of the horizon will be coincident to the line of Right Ascension equal to the local Sidereal time.

STAR MAP 2 - 0 TO 12 HOURS R.A.



STAR MAP 3 - 12 TO 24 HOURS R.A.



OCCULTATIONS

This section is intended for use by advanced amateur and professional astronomers — it will undoubtedly appear complicated to persons without detailed knowledge.

An occultation occurs when the disk of the Moon moves in front of a star. Predictions of occultations of all stars brighter than magnitude 7.5, supplied by H.M. Nautical Almanac Office, are given below. The main set of tables gives predictions for three stations, namely,

	Longitude	Latitude
Cape Town	- 18°.475	- 33°.933
Johannesburg	- 28 .075	- 26 .182
Salisbury	- 31 .040	- 17 .788

This does not restrict its use to observers at those centres. The approximate time of an occultation at a place $\Delta\lambda$ degrees west and $\Delta\phi$ degrees north of one of the standard stations given above may be found from:

$$\text{Approximate time} = \text{predicted time} + a.\Delta\lambda + b.\Delta\phi$$

where a and b, in minutes of time, are given in the tables. Alternatively, rough times for intermediate stations can usually be estimated direct from the tables.

Occulted stars have been identified by their Z.C. numbers, that is their numbers in the "Catalogue of 3539 Zodiacal Stars for the Equinox 1950.0" by James Robertson (U.S. Naval Observatory, 1939). An index for stars brighter than magnitude 6.0, giving their more common designations, is also provided.

Timings of occultations, to a precision of one-tenth of a second if possible, are very valuable for studies of the Moon's shape and motion. Since only very modest equipment is required, amateurs can make important contributions in this field. Persons interested in making and reporting occultation observations are urged to contact the Director of the Society's Occultation Section, Mr A.G.F. Morrisby (c/o Dept. of Surveyor General, P.O. Box 8099, Causeway, Salisbury, Rhodesia).

Explanations of Abbreviations used in Tables

Z.C.	—	*the number of the star in the Zodiacal Catalogue. An "m" following the number indicates the star is not single.*
Sp	—	*the spectral classification of the star.*
Mag	—	*the visual magnitude*
Ph	—	*the Phase: D = Disappearance, R = Reappearance*
h.m.	—	*the time of the occultation is SAST*
a,b	—	*parameters in minutes for predicting times other than at standard stations (explained above in text)*
P.A.	—	*the Position Angle on the Moon's limb measured eastward from the north point.*
N	—	*No occultation*
S	—	*Sunlight interferes*
A	—	*Moon at very low altitude*
G	—	*Grazing occultation*

LUNAR OCCULTATIONS - 1972

Date		Z.C.	Mag	Sp	Ph	Cape Town h. m.	a	b	P.A.	Johannesburg h. m.	a	b	P.A.	Salisbury h. m.	a	b	P.A.
Jan	3	1310m	4.2	K0	D		N				N			01 12.8	-1.0	-3.4	168°
	3	1310m	4.2	K0	R		N				N			00 19.2	-3.9	+0.7	360
	11	2134m	6.1	K5	R	09 41.4	+1.2	-3.7	357°		N				N		
	22	191	7.4	G5	D		N				N			19 30.9	-	-	118
	23	329	7.1	K0	D		S			19 49.7	-	-	127°	19 52.6	-2.7	-0.1	102
	23	337	5.7	A0	D		N				N			22 28.4	-0.6	-0.3	110
Feb	3	1759m	6.5	A5	R	22 53.1	-0.3	-1.6	290	22 42.4	-0.3	-1.9	311	22 25.2	-0.1	-2.4	334
	5	1970	6.2	A0	R	24 14.2	-0.1	-1.7	299	23 59.5	+0.1	-2.2	324	23 37.2	+0.7	-3.2	352
	7	2084	6.5	A0	R		N				N			01 25.8	-1.5	-0.4	264
	9	2349m	3.1	B1	D	02 28.7	0.0	-1.6	113	02 22.8	-0.8	-0.6	79		G		
	9	2349m	3.1	B1	R	03 32.5	-0.6	-1.5	283	03 21.7	-0.2	-2.5	320		G		
	9	2366m	1.2	M0,A3	D		N			08 06.2	-	-	144	07 58.2	-3.2	-0.9	108
	9	2366m	1.2	M0,A3	R		N			09 09.6	-	-	224	09 34.7	-2.1	+1.2	256
	10	2479m	5.3	K0	R	02 49.1	-	-	204	03 01.3	-0.6	-0.6	259	02 55.5	-0.2	-1.1	288
	10	2480m	5.3	K0	R	02 48.6	-	-	203	03 01.3	-0.7	-0.5	258	02 55.6	-0.3	-1.1	288
	20	443	7.4	G5	D		N				N			21 35.1	-0.3	-0.4	119
	22	746m	6.8	B9	D		S			19 14.0	-2.7	-0.8	119	19 17.8	-2.9	-0.2	97
	22	756	6.5	A2	D	21 44.9	-2.4	+1.9	52		N				N		
	23	926	7.0	B9	D		N			23 07.3	-	-	167	22 56.1	-0.8	-0.8	129
	24	1068	6.9	A2	D		S			19 23.3	-2.5	-0.5	89	19 31.9	-3.0	+0.8	66
Mar	3	1845m	6.5	K0	R	04 52.5	-	-	7		N				N		
	4	1944	5.6	K0	R		N				N			02 59.2	-	-	249
	4	2039	5.6	B9	R	23 04.5	+0.2	-2.3	328	22 34.4	-	-	12		N		
	4	2045	6.4	G5	R	24 19.5	-0.7	-1.8	293	24 08.9	-0.3	-2.5	326	23 42.7	+1.0	-4.0	309
	5	2051	5.7	A0p	R	01 16.5	-0.8	-2.3	312	00 57.8	+0.4	-4.0	354		N		
	6	2157	6.1	K0	R	00 38.4	-0.2	-2.1	308	00 18.2	+0.6	-3.4	347		N		
	7	2286	5.4	B8	R	01 19.0	-1.1	-0.7	254	01 19.3	-0.8	-1.6	291	01 04.8	-0.2	-2.3	320
	10	2719	5.8	B8	R	02 14.9	-0.8	+0.6	220	02 19.0	-0.4	-0.6	262	02 11.6	0.0	-1.4	293
	12	3017	5.3	M0	R	04 12.5	-	-	184	04 31.1	-0.8	+0.3	236	04 32.3	-0.7	-0.6	288
	19	529	6.2	A0	D	19 50.4	-1.6	+1.8	55		N				N		
	22	1046	6.9	F8	D	21 40.7	-3.0	+2.4	56		N				N		
	22	1049	6.6	A2	D	22 13.1	-2.5	+2.2	61		N				N		
	25	1310m	4.2	K0	D	00 12.6	-1.5	+0.8	97		N				N		
	25	1396	7.1	K2	D		S			18 52.9	-1.9	-1.7	120	18 47.9	-2.5	-0.9	98
	26	1413	6.7	B9	D		N			01 52.1	+0.1	-1.7	161	01 43.3	-0.4	-0.6	126
	27	1599	5.0	K0	D	20 00.9	-1.4	-1.5	100	20 14.9	-	-	65		N		
Apr	2	2237	5.1	K0	R	23 38.6	-0.9	-1.3	274	23 33.4	-0.6	-2.1	309	23 11.9	+0.4	-3.4	342
	4	2514	6.3	A0	R	23 54.7	+0.1	-1.8	298	23 30.1	+1.5	-4.4	345		N		
	5	2524	6.0	B9	R	02 35.1	-1.8	-0.7	264	02 41.2	-1.8	-2.3	302		G		
	6	2672	2.9	K0	D	02 10.1	-0.6	-2.0	115	02 11.0	-1.6	-0.3	77	02 24.6	-	-	38
	6	2672	2.9	K0	R	03 21.1	-1.9	+0.1	247	03 36.1	-2.2	-1.3	281	03 22.1	-	-	321
	6	2678	6.2	B2p	R	04 17.3	-2.0	-1.3	281	04 19.7	-	-	319		N		
	21	1375	5.6	K0	D	20 25.0	-0.4	-2.5	171	20 22.8	-1.7	-1.1	130	20 23.5	-2.8	-0.2	101
	22	1474	7.1	F2	D	20 29.7	-1.6	-1.6	137	20 43.2	-2.9	-0.2	99		N		
	23	1577	7.1	A2	D		N			23 54.1	-	-	201	23 25.7	-0.8	-2.1	152
	25	1688m	6.3	K0	D		N				N			02 11.4	-0.4	-1.8	151
	25	1759m	6.5	A5	D		S			18 31.8	-1.6	-1.1	91		G		
May	1	2349m	3.1	B1	D		N			00 29.0	-1.7	-2.9	136	00 19.7	-2.7	-1.0	103
	1	2349m	3.1	B1	R		N			01 54.8	-3.2	+1.1	253	02 05.2	-3.2	-0.8	286
	2	2479m	5.3	K0	R		N				N			01 49.0	-	-	214
	2	2480m	5.3	K0	R		N				N			01 48.6	-	-	213
	3	2622	6.3	B8	R	01 04.8	-1.3	-1.7	286	00 53.3	-	-	332		N		
	7	3188	5.4	A0	R		N				N			05 26.9	-	-	172
	9	3444	6.5	K2	R		A				A			03 02.3	-0.4	+0.2	245
	9	3453	4.9	A2p	R	05 02.7	-1.2	-2.0	284		N				N		
	9	3455	6.4	K0	R	05 11.8	-0.8	-0.2	247	05 20.3	-1.6	-0.5	263	05 14.4	-	-	296
	16	1070	5.2	K0	D		N			18 25.2	+0.1	-1.9	161	18 16.8	-0.9	-0.7	127
	17	1216	7.3	A2	D	19 33.2	-2.0	+1.2	82		N				N		
	19	1441	6.4	F0	D	19 05.5	-2.5	-0.2	101		N				N		
	19	1442	Var	M8	D	19 19.1	-1.9	-0.8	122	19 44.0	-3.6	+1.7	76		N		
	22	1743	6.8	M0	D		N			23 14.7	-	-	183	22 54.1	-1.4	-1.8	141

Date		Z.C.	Mag	Sp	Ph	Cape Town					Johannesburg					Salisbury				
						h.	m.	a	b	P.A.	h.	m.	a	b	P.A.	h.	m.	a	b	P.A.
May	24	1944	5.6	K0	D			N					N			21	15.6	-	-	177°
	25	2045	6.4	G5	D	18	24.7	+0.1	-2.5	151°	18	10.5	-0.6	-1.8	119°	18	01.9	-1.2	-0.8	93
	25	2051	5.7	A0p	D	19	15.2	-0.5	-2.2	133	19	11.0	-1.6	-1.2	99	19	15.5	-	-	62
Jun	3	3131	5.6	A5	R	00	33.6	-0.5	-2.0	287			N					N		
	4	3269	4.3	K0	D			N					N			01	13.7	-1.4	-2.5	116
	4	3269	4.3	K0	R			N					N			01	55.7	-0.7	+3.9	186
	8	266	5.7	A0	R			A			04	21.3	-0.7	-0.7	264	04	14.3	-1.6	-2.2	295
	13	Mars	2.0		D	14	24.4	-1.8	-1.5	140	14	36.5	-2.4	-0.6	111	14	43.9	-3.3	+0.5	84
	13	Mars	2.0		R	15	43.5	-2.5	+0.5	267	16	03.8	-1.5	-0.5	302	15	57.6	-0.7	-2.0	332
	13	1152	6.9	G5	D	18	28.6	-0.5	-0.1	128	18	38.2	-0.8	+1.0	88			N		
	15	1399	6.9	G5	D			N					N			20	35.3	-	-	198
	15	1405	7.0	K0	D	20	58.6	-1.1	+2.0	76			N					N		
	18	1705	7.5	F2	D			N					N			19	22.7	-0.3	-4.0	177
	19	1800	5.4	A0	D			N					N			21	42.7	-1.0	-3.6	168
	20	1918	7.0	K2	D			N			23	43.5	-1.2	-1.7	147	23	39.1	-1.1	-0.4	115
	21	2011	6.5	K0	D	18	20.3	-	-	66			N					N		
	24	2269	5.4	B5	D	02	25.7	-1.3	+0.2	113	02	39.3	-0.7	+0.6	99	02	48.0	-0.2	+1.1	76
	26	2672	2.9	K0	D			N					N			20	42.8	-	-	161
	26	2672	2.9	K0	R			N					N			21	10.9	-	-	200
	28	2963m	5.5	K0	R	23	13.7	-	-	180	23	54.1	-2.0	+1.8	222	24	11.1	-2.6	+0.7	250
	29	2981m	5.2	B8	R			G			05	09.4	-	-	163	05	42.0	+0.4	+3.1	193
	29	2987m	5.0	F0	R	06	22.2	-0.3	+2.4	215			S					S		
	29	3100	6.4	A5	R	23	52.7	-	-	181	24	26.9	-1.6	+2.0	215	24	44.7	-2.3	+1.0	242
	30	3112	6.2	A0	R	04	49.0	-2.2	+0.9	262	05	17.4	-1.9	+1.1	261	05	30.0	-2.4	+0.2	278
Jul	2	3371	6.4	F2	R	06	16.6	-	-	299			S					N		
	5	221m	3.7	G5	D			N			03	48.9	-	-	119	03	43.0	-1.9	-0.5	89
	5	221m	3.7	G5	R			N			04	20.2	-	-	171	04	44.0	-0.5	+2.3	198
	17	1872	7.3	K0	D	19	48.7	-2.0	-0.5	116	20	14.9	-2.4	+2.1	75			N		
	18	1993	6.8	K0	D	23	57.7	-0.6	+0.4	113			A					A		
	19	2084	6.5	A0	D	18	48.1	-1.1	-3.3	154	18	49.3	-2.7	-1.2	112	18	57.1	-4.1	+1.1	77
	21	2349m	3.1	B1	D	21	29.9	-2.3	-3.7	146	21	39.6	-2.8	-0.8	111	21	48.7	-2.8	+0.9	81
	21	2349m	3.1	B1	R	22	32.4	-2.1	+3.7	227	23	09.6	-1.7	+1.7	252	23	22.9	-2.0	+0.2	278
	23	2364	6.8	A2p	D	01	44.3	-0.9	+0.7	104	01	56.3	-0.4	+0.8	94	02	04.5	+0.1	+1.1	73
	23	2622	6.3	B8	D	19	48.2	-1.5	-1.1	92	20	07.8	-2.7	+1.4	55					
	24	2659	6.4	M3	D	03	48.4	-0.7	+0.9	100	03	59.0	-0.2	+0.7	96			A		
	29	3453	4.9	A2p	R	23	50.1	-0.5	+1.2	208	24	05.6	-1.0	+1.0	224	24	16.0	-1.7	+0.5	247
	29	3455	6.4	K0	R			N			23	52.0	-0.2	+3.0	186	24	12.4	-1.0	+1.8	214
	31	42	5.6	K0	R	02	07.7	-1.9	-0.8	267	02	24.4	-2.8	-0.7	272			G		
Aug	12	1726	6.9	F5	D			S					S			18	08.0	-1.7	+1.5	78
	14	1944	5.6	K0	D	21	02.9	-1.1	-1.9	155	21	04.0	-0.8	-0.5	126	21	05.8	-0.5	+0.4	98
	17	2286	5.4	B8	D	19	02.5	-2.1	-3.0	141	19	13.9	-2.9	-0.6	106	19	26.0	-3.1	+1.4	74
	17	2295m	7.0	A0	D			N			22	24.9	-2.0	-1.6	138	22	24.2	-1.4	-0.1	109
	17	2299	6.4	K0	D	22	30.3	-1.2	+1.5	81	22	51.5	-0.5	+1.8	67	23	10.7	+0.5	+3.0	38
	18	2427	7.1	F8	D	20	31.7	-2.5	+1.1	76	21	09.1	-1.8	+2.9	51			G		
	19	2452	6.7	B9	D	02	05.4	-0.1	+0.8	102			A					A		
	22	2987m	5.0	F0	D	18	57.8	-	-	4			N					N		
	28	266	5.7	A0	R			A			22	49.6	-0.7	-1.0	271	22	37.7	-	-	309
	29	288	5.2	G5	R			N					N			04	04.5	-	-	184
Sep	13	2237	5.1	K0	D	18	50.4	-2.2	0.0	105	19	15.5	-1.7	+1.3	81	19	36.3	-0.9	+2.9	51
	15	2514	6.3	A0	D	19	29.5	-2.9	-1.9	125	19	50.1	-2.6	-0.1	104	20	01.8	-2.1	+1.1	79
	16	2659	6.4	M3	D	19	38.2	-2.5	+0.6	82	20	10.4	-2.1	+1.7	66	20	34.4	-1.3	+2.8	42
	17	2822	5.6	A5	D	23	11.7	-1.9	+0.6	100	23	32.6	-1.3	+0.7	97	23	42.8	-0.8	+1.0	79
	18	2838	5.6	K0	D	02	14.2	0.0	+1.1	88			A					A		
	18	2940	7.3	F8	D	20	43.3	-2.6	-0.1	89	21	12.1	-2.6	+0.8	79	21	29.8	-2.1	+1.7	60
	19	2959	7.2	A2	D	01	15.0	-0.7	+1.5	74	01	30.7	-0.3	+1.3	71	01	42.6	+0.1	+1.5	55
	20	3083m	7.3	K0	D	00	27.1	-0.3	+2.8	21	00	50.7	-0.1	+2.7	21	01	15.9	+0.9	+3.8	359
	24	221m	3.7	G5	D	22	58.6	-1.4	-0.8	86	23	09.6	-1.8	-0.3	80	23	16.5	-1.7	+0.7	62
	24	221m	3.7	G5	R	23	58.9	-0.6	+1.2	208	24	17.7	-1.0	+1.6	210	24	34.7	-1.7	+1.5	226
Oct	12	2469	6.3	A0	D	21	11.7	-0.2	+1.9	64	21	25.8	+0.3	+1.8	56			A		

Date		Z.C.	Mag	Sp	Ph	Cape Town h. m.	a	b	P.A.	Johannesburg h. m.	a	b	P.A.	Salisbury h. m.	a	b	P.A.
Oct	14	2754	5.9	B8	D	19 58.4	-1.1	+2.8	41°	20 28.2	-0.5	+2.8	35°	20 55.8	+0.8	+4.1	11°
	14	2769	6.3	K5	D	23 16.0	+0.1	+1.9	52	23 27.9	+0.4	+1.8	47	A			
	16	3011	7.0	A0	D	S				S				18 37.9	-3.0	+0.8	75
	16	3029	6.9	F0	D	23 37.2	-0.7	+1.7	64	23 54.8	-0.3	+1.6	62	24 08.9	+0.1	+1.7	46
	18	3169	6.2	K0	D	01 50.3	-0.7	+0.5	113	A				A			
	18	3281	7.5	A2	D	19 56.3	-1.9	+0.4	67	20 22.6	-2.2	+1.1	63	20 41.5	-1.9	+1.9	47
	18	3290	7.3	F0	D	23 49.1	-0.9	+2.1	40	24 13.7	-0.7	+2.2	39	24 34.6	-0.3	+2.6	22
Nov	10	2706	5.8	B9	D	S				19 25.4	+0.6	+3.6	18	N			
	11	2851	6.0	A2	D	S				19 23.4	-1.5	+1.1	85	19 37.7	-1.0	+1.4	68
	11	2859	6.7	G0	D	21 52.1	-0.4	+1.3	86	22 03.3	0.0	+1.1	82	A			
	17	65	7.3	K2	D	S				S				18 55.9	-2.0	+0.5	68
	18	221m	3.7	G5	D	N				N				21 33.5	-	-	114
	19	245	6.1	K0	D	02 15.5	-	-	137	02 22.2	-0.7	+0.4	107	02 29.4	-0.7	+0.8	82
	23	900	4.9	B2	R	01 07.7	-2.0	-0.6	275	01 24.1	-2.4	-0.7	289	01 21.7	-2.6	-1.8	312
	26	1337	5.6	A5	R	A				00 17.2	-0.7	0.0	245	00 16.8	-1.0	-0.6	269
	28	1565m	6.3	K0	R	03 46.8	-	-	4	N				N			
Dec	10	3066	6.0	A3	D	N				N				20 38.4	-	-	137
	10	3072	6.6	G5	D	22 00.1	+0.7	+3.2	3	A				A			
	11	3187	6.2	M0	D	S				20 14.5	-0.6	+2.1	47	20 33.9	-0.2	+2.3	31
	13	3452	6.8	K0	D	22 51.4	-0.8	+1.6	69	23 09.8	-0.4	+1.7	58	A			
	14	31	6.2	G5	D	22 47.8	-1.3	+1.4	79	23 09.2	-0.8	+1.5	68	23 25.0	-0.7	+1.8	48
	15	161	7.3	F2	D	21 45.3	-	-	351	N				N			
	17	320	5.9	M0	D	01 23.0	-1.2	+2.4	33	A				A			
	22	1275	5.6	M0	R	23 01.0	-1.0	-1.8	303	22 57.6	-1.4	-2.2	318	22 38.6	-1.7	-4.0	346
	25	1518	6.3	K0	R	02 40.1	-2.2	-0.9	268	02 51.7	-2.1	-1.5	300	02 41.4	-1.6	-2.3	324
	30	2039	5.6	B9	R	A				02 04.8	0.0	-1.3	289	A			
	30	2045	6.4	G5	R	N				02 56.8	-1.3	+0.2	241	02 56.4	-0.7	-0.8	273
	30	2051	5.7	A0p	R	N				03 59.3	-1.5	-0.7	263	03 53.9	-1.0	-1.4	291

Z.C.			Z.C.			Z.C.		
42	41	PSC	1599	58	LEO	2706	117	SGT
221	η	PSC	1800	21	VIR	2719	126	SGT
266	4	ARI	1944	75	VIR	2754	154	SGT
288	i	ARI	2039	43	VIR	2822	222	SGT
320	15	ARI	2051	236	VIR	2838	50	SGT
337	θ	ARI	2237	42	LIB	2963	σ	CPR
900	139	TAU	2269	31	SCO	2981	π	CPR
1070	ω	GEM	2286	40	SCO	2987	ρ	CPR
1275	θ	CNC	2349	σ	SCO	3017	ν	CPR
1310	δ	CNC	2366	α	SCO	3131	18	AQR
1337	o^1	CNC	2371	22	SCO	3188	λ	CPR
1375	π	CNC	2479	36	OPH	3269		AQR
1442	R	LEO	2480	-26°	12026	3453		PSC
1565	35	SXT	2672	λ	SGT			

GRAZING OCCULTATIONS

The two maps show the tracks of stars brighter than 7.5 magnitude which will graze the limb of the Moon when it is at a favourable elongation from the Sun and at least 10^{o} above the observer's horizon.(2^{o} in the case of bright stars). Each track

starts in the West at some arbitrary time given in the key and ends beyond the area of interest, except where the letters "A", "B" or "S" are given. "A" denotes that the Moon is at a low altitude, "B" that the bright limb interferes, and "S" that sunlight interferes. The tick marks along the tracks denote 5 minute intervals of time which, when added to the time at the beginning of the track, give the approximate time of the graze at places along the tracks.

Observers positioned on, or very near, one of these tracks will probably see the star disappear and reappear several times at the edge of features on the limb of the Moon. The recorded times of these events (to a precision of a second, if possible) are very valuable in the study of the shape and motion of the Moon currently being investigated at the Royal Greewich Observatory and the U.S. Naval Observatory. The Society Coordinator for Grazing Occultations is Mr. M.D. Overbeek, 60 Edward Drive, Glendower, Edenvale, Transvaal.

KEY TO MAP 1

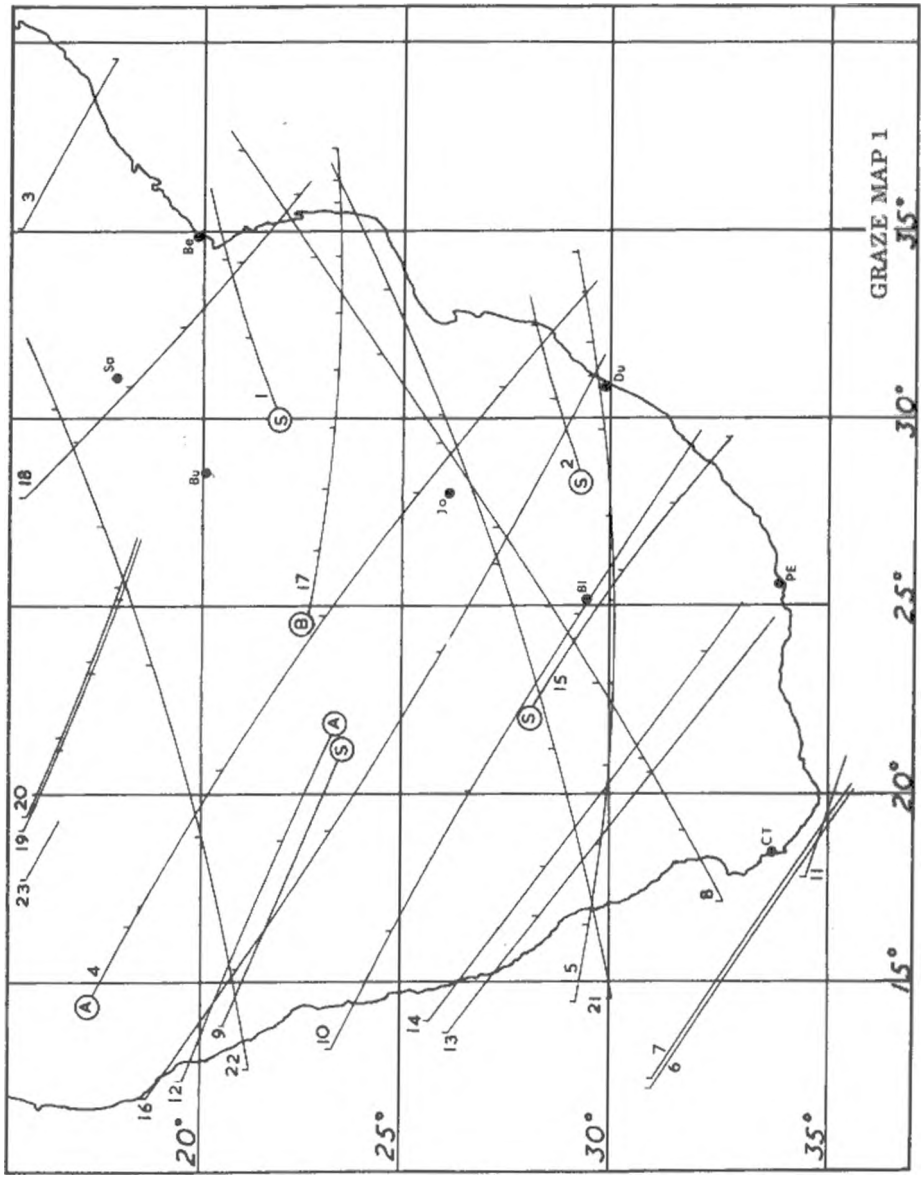
	ZC	NAME	MAG	DATE	BEGINNING	N OR S LIMIT
					$19^h\ 45^m$	
1	191	+13°192	7.4	Jan 22		S
2	329	59B Ari	7.1	Jan 23	20 07	S
3	1967	83 Vir	5.7	Feb 5	23 13	S
4	2084	9G Lib	6.5	Feb 7	00 54	S
5*	2366	α Sco	1.2	Feb 9	08 06	S
6*	2479	36 Oph	5.3	Feb 10	02 40	S
7*	2480	36 Oph	5.3	Feb 10	02 40	S
8	2672	Sgr	2.9	Feb 11	11 43	N
9	2811	208B Sgr	6.2	Feb 12	05 19	S
10	756	38B (Aur)	6.5	Feb 22	22 10	N
11	3017	ν Cap	5.3	Mar 12	04 04	S
12	529	11 Tau	6.2	Mar 19	20 27	N
13	1046	+25°1460	6.9	Mar 22	21 56	N
14	1049	86B Gem	6.6	Mar 22	22 32	N
15	1287	94B Cnc	6.7	Mar 24	19 32	N
16*	1310	δ Cnc	4.2	Mar 25	00 32	N
17	2678	-25°13170	6.2	Apr 6	03 40	N
18	1474	+10°2100	7.1	Apr 22	21 04	N
19*	2479	36 Oph	5.3	May 2	00 56	S
20*	2480	36 Oph	5.3	May 2	00 57	S
21	3453	κ Psc	4.9	May 9	04 38	N
22	3455	9 Psc	6.4	May 9	04 39	N
23	1080	+24°1531	6.9	May 16	20 47	N

*Notes

No.

5 ZC 2366 is the brighter component of double star Aitken 10074. The companion is 5th magnitude; separation 2".7 in p.a. 275°.

6, 19, 36	ZC 2479) A	are components of double star Aitken 10417; separation 4".5 in p.a. 158°.
7, 20, 37	ZC 2480) B	
16	ZC 1310	is the brighter component of the double star Aitken 6967. The companion is 11th magnitude; separation 38" in p.a. 90°.



ZC 2994 is the brighter component of double star Aitken 13902. The companion is 6.6 magnitude; separation 21" in p.a. 239°.

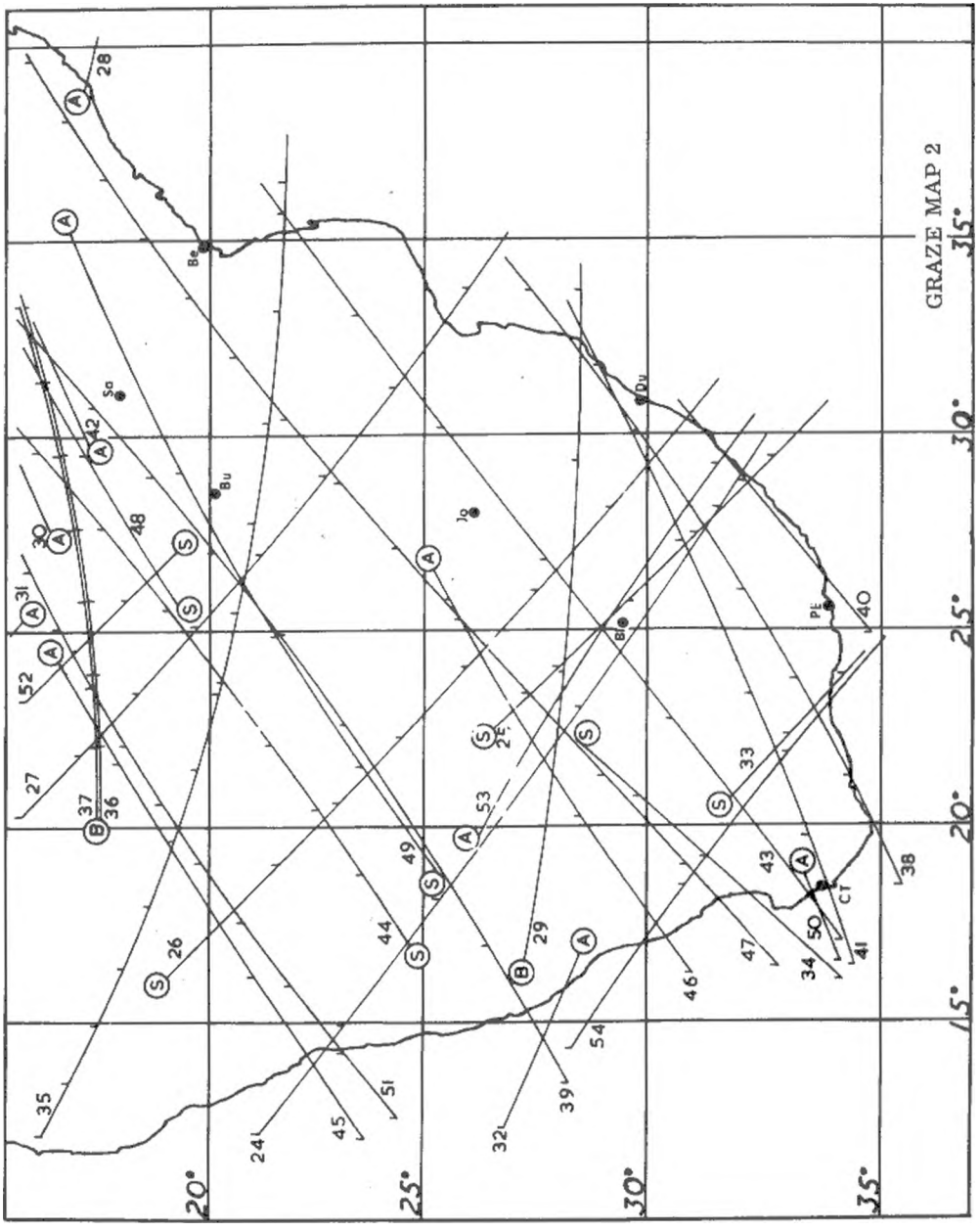
ZC 2295 is the brighter component of the double star Aitken 9899. The companion is 9th magnitude; separation 4".5 in p.s. 348°.

ZC 518 is the mean of two components of the triple star Aitken 2616. The close components are both 7th magnitude; separation 0".5 in p.a. 15°. The third component is 10th magnitude; separation 22" in p.a. 57°.

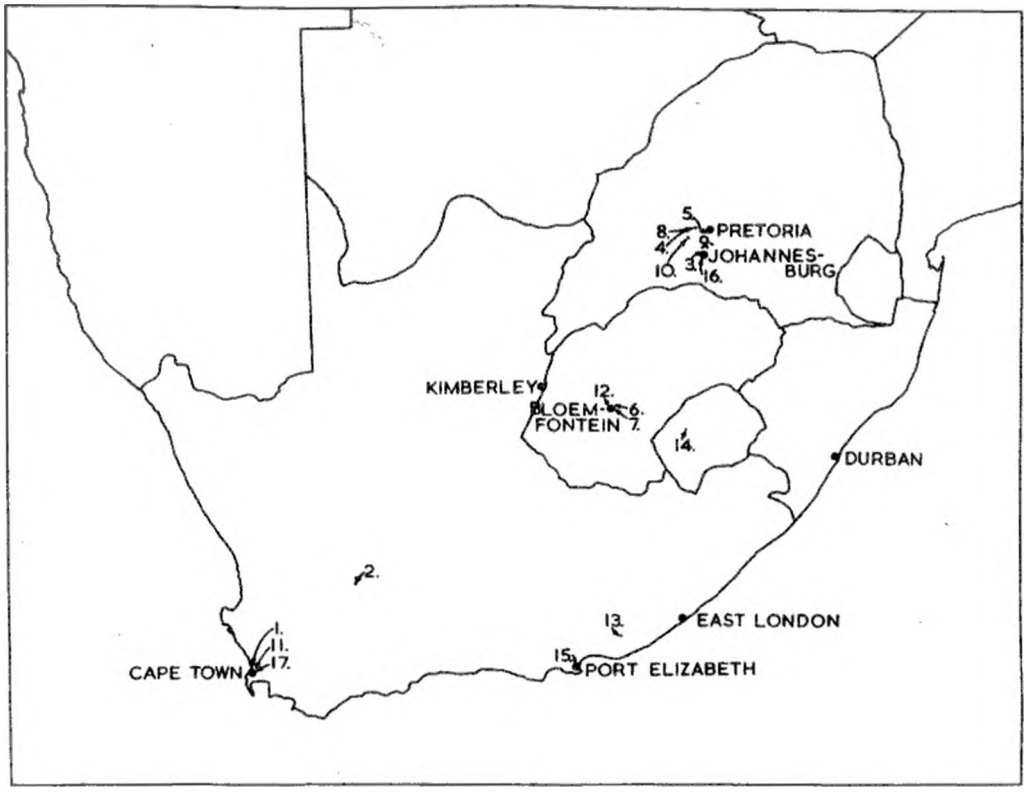
KEY TO MAP 2

	ZC	NAME	MAG	DATE	BEGINNING	N OR S LIMIT
					$19^h\ 51^m$	
24	1216	+21°1753	7.3	May 17	19 51	N
25	1439	18 Leo	5.9	May 19	18 43	N
26	1441	19 Leo	6.4	May 19	19 19	N
27	1442	R Leo	5.0	May 19	19 42	N
28*	2994	o Cap	6.1	Jun 1	21 42	S
29	3131	18 Aqr	5.5	Jun 3	00 04	N
30	266	4 Ari	5.7	Jun 8	03 57	N
31	1152	+22°1735	6.9	Jun 13	19 03	N
32	1405	+13°2104	7.0	Jun 15	21 17	N
33	2011	-16°3785	6.5	Jun 21	18 41	N
34	3371	-2°5858	6.4	Jul 2	05 58	N
35	1872	-11°3418	7.3	Jul 17	19 58	N
36*	2479	36 Oph	5.3	Jul 22	21 50	S
37*	2480	36 Oph	5.3	Jul 22	21 50	S
38	3320	κ Aqr	5.3	Jul 29	00 25	N
39	42	41 Psc	5.6	Jul 31	01 35	N
40	320	15 Ari	5.9	Aug 2	03 05	N
41*	2295	-24°12481	7.0	Aug 17	22 29	S
42	266	4 Ari	5.7	Aug 28	22 27	N
43*	518	7 Tau	5.9	Sep 27	00 45	N
44	2892	292B Sgr	6.8	Oct 15	19 49	S
45	2714	26 Sgr	6.1	Nov 10	21 05	S
46	2979	-17°5975	7.1	Nov 12	22 39	S
47*	221	η Psc	3.7	Nov 18	21 15	S
48	2935	347B (Sgr)	7.0	Dec 9	19 49	S
49	3066	95B (Cap)	6.0	Dec 10	20 28	S
50	3199	-9°5854	6.8	Dec 11	22 42	S
51	302	35B Ari	6.4	Dec 16	21 09	S
52	1623	69 Leo	5.4	Dec 26	04 48	S
53	2045	231G Vir	6.4	Dec 30	02 38	S
54	2051	236G Vir	5.7	Dec 30	03 30	S

47 ZC 221 is the brighter component of double star Aitken 1199. The companion is 8th magnitude; separation 1" in p.a. 36°.



ASTRONOMICAL INSTITUTIONS IN SOUTH AFRICA



1. *South African Astronomical Observatory — Headquarters (previously the Royal Observatory)*
2. *South African Astronomical Observatory — Observing Station (near Sutherland)*
3. *Republic Observatory (also present centre of time services for S.A.)*
4. *Republic Annexe (near Hartebeespoort Dam)*
5. *Radcliffe Observatory (has largest optical telescope in S.A. — 74-inch reflector)*
6. *Boyden Observatory (at Mazelspoort)*
7. *Lamont Hussey Observatory (on Naval Hill in Bloemfontein)*
8. *Leiden Southern Station (sharing site of Republic Annexe)*
9. *Smithsonian Satellite Tracking Station*
10. *Radio Space Research Station (at Hartebeesthoek)*
11. *Department of Astronomy, University of Cape Town*
12. *Department of Astronomy, University of the Orange Free State (incorporated in Boyden Observatory)*
13. *Department of Physics, Rhodes University (Radio Astronomy)*
14. *Lesotho Observatory Foundation (at Roma)*
15. *Port Elizabeth People's Observatory*
16. *Johannesburg Planetarium (University of the Witwatersrand)*
17. *Cape Town Planetarium (within the S.A. Museum)*

ASSA OFFICE BEARERS

COUNCIL

President: Prof. A.H. Jarrett
Vice-Presidents: Messrs. W.C. Bentley, G.A. Harding and K.J. Sterling.
Members of Council: Drs A.D. Thackeray and A.P. Fairall, Messrs. J Hers and C.J. Poole
Hon. Secretary: Mr. T.W. Russo
Hon. Treasurer: Mr. G. Orpen.

NATAL CENTRE

Chairman: Mr. S.S. Booysen (also Council Representative),
Hon. Secretary/Treasurer: Mrs. J. Donaldson,
Committee Members: Messrs J. Barker, G.D.E. Davidson, A. Gray, E.H. Hobson, and Dr. J.S. Mattelaer.

TRANSVAAL CENTRE

Chairman: Mr. F. Bateman,
Secretary: Mr. G.J. Sizoo,
Council Representative: Mr. D. Overbeek.

PRETORIA CENTRE

Chairman: Mr. K.J. Sterling,
Vice-Chairman: Mr. J.C. Bennett,
Hon. Secretary: Mr. R.A. Venter,
Hon. Treasurer: Mr. A.S. Bruto,
Council Representative: Mr. J.C. Bennett,
Committee Members: Messrs. A. Delen, N. Ferreira, P.S. Fouche and P. Adair.
Curator of Instruments: Mr. R. Matthews.

BLOEMFONTEIN CENTRE

Chairman: Mr. G.J. Muller (also Council Representative),
Vice-Chairman: Mr. J. Rhodes,
Hon. Secretary/Treasurer: Mr. F.C. Neser,
Committee Member: Mr. G.N. Walker.

CAPE CENTRE

Chairman: Mr. R.F. Hurly,
Vice-Chairman: Dr. A.P. Fairall,
Hon. Secretary: Mr. H.B. Molyneux,
Hon. Treasurer: Mr. N. Saville,
Hon. Auditor: Mr. G. Orpen,
Committee Members: Messrs. G.R. Atkins, C. Larmuth, G.H. Larmuth and N.O. Neale.

PAST PRESIDENTS

1922-23	S.S. Hough	1946-47	W.P. Hirst
1923-24	R.T.A. Innes	1947-48	J. Jackson
1924-25	J.K.E. Halm	1948-49	A.E.H. Bleksley
1925-26	W. Reid	1949-50	W.S. Finsen
1926-27	H. Spencer Jones	1950-51	H.E. Krumm
1927-28	A.W. Roberts	1951-52	A.D. Thackeray
1928-29	A.W. Long	1952-53	J.C. Bentley
1929-30	H.E. Wood	1953-54	David S. Evans
1930-31	D. Cameron-Swan	1954-55	P. Kirchhoff
1931-32	H.L. Alden	1955-56	W.H. van den Bos
1932-33	H. Spencer Jones	1956-57	S.C. Venter
1933-34	D.G. McIntyre	1957-58	M.W. Feast
1934-35	J.K.E. Halm	1958-59	H. Haffner
1935-36	J. Jackson	1959-60	P. Smits
1936-37	H.E. Houghton	1960-61	G.G. Cillie
1937-38	J.S. Paraskevopoulos	1961-62	M.D. Overbeek
1938-39	T. Mackenzie	1962-63	A.J. Wesselink
1939-40	R.A. Rossiter	1963-64	A.G.F. Morrisby
1940-41	E.B. Ford	1964-65	H.C. Lagerwey
1941-42	H. Knox Shaw	1965-66	A. Menzies
1942-43	A.F.I. Forbes	1966-67	G.R. Atkins
1943-44	W.H. van den Bos	1967-68	J. Hers
1944-45	A.W.J. Cousins	1968-69	J.C. Bennett
1945-46	R.H. Stoy	1969-70	J. Churms

1970-71 W.C. Bentley

HONORARY SECRETARIES

1922	H.W. Schonegevel	1930	S. Skewes
1922	T. Mackenzie	1931	H. Horrocks
1923	C.L. O'Brien Dutten	1934	H.W. Schonegevel
1923	H.E. Houghton	1935	A. Menzies

1965 T.W. Russo

HONORARY MEMBERS

Prof. A.E. Bleksley	Dr R.O. Redman
Mr R.P. de Kock	Dr J. Schilt
Dr D.S. Evans	Dr H. Shapley
Prof. Ch. Fehrenbach	Dr R.H. Stoy
Dr W.S. Finsen	Dr W.S. van den Bos
Dr H. Haffner	Dr A.G. Velghe
Dr J.H. Oort	Sir Richard Woolley

GILL MEDALLISTS

1956	H. Knox Shaw	1963	A.W.J. Cousins
1957	W.P. Hirst	1965	R.H. Stoy
1958	J. Jackson	1967	W.S. Finsen
1960	W.H. van den Bos	1970	J.C. Bennett

INFORMATION FOR PROSPECTIVE MEMBERS

(continued from inside front cover)

Centres of the Society

NATAL CENTRE (Durban) - Meetings every 3rd Wednesday evening at 7:45 p.m. at the University City Building, Lancers Road (behind the Alhambra Theatre). Occultation and telescope making sessions. Secretarial Address: 32 Surrey Mansions, 323 Currie Road, Durban, Telephone (evenings) 34-4912.

TRANSVAAL CENTRE (Johannesburg) - Meetings of the Centre are normally held every month at the Republic Observatory, and alternate between lecture meetings and observing meetings.
There is a very enthusiastic Lunar occultation group which observes graze occultations within a radius of approx. 150 miles of Johannesburg. A variable star group is in the process of formation.
Mirror making classes are held at suitable intervals, and the centre has its own Aluminising plant operated by Mr. T. Geary, Curator of Instruments and Director of the Johannesburg Planetarium.

Chairman:	F. de J. Bateman,	Phone 46-2052
Vice-Chairman:	M.D. Overbeek,	Phone 53-5447
Secretary:	G.J. Sizoo,	Phone 46-7392
Treasurer:	C. Papadopoulos	Phone 41-5188

CAPE CENTRE (Cape Town) - Meetings on 2nd Wednesday of the month (except Jan, Feb and December) at the South African Astronomical Observatory Headquarters (previously the Royal Observatory) at 8:00 p.m. The Centre possesses a small observatory housing the twelve inch Ron Atkins Telescope. There is also an active occultation section. Secretarial Address: "Pennington", 34 Balfour Road, Rondebosch. Telephone (evenings) 6-3123. Information on meetings also available from Department of Astronomy, U.C.T. Telephone (day time) 69-8531 ext. 256.

BLOEMFONTEIN CENTRE - Meetings on 2nd Thursday of the month at homes of members. For further information, contact Mr. G.J. Muller, 35 Wilcocks Road, Bloemfontein. Telephone (evenings) 7-3442 - or Mr. J. Rhodes, Telephone 7-1981 (day time).

PRETORIA CENTRE - Secretarial address: 62 Patricia Avenue, Murrayfield, Pretoria.

Observing Sections of the Society

COMETS AND METEORS - Mr J.C. Bennett, 90 Malan Street, Riviera, Pretoria.

VARIABLE STARS - Mr R.P. de Kock, The South African Astronomical Observatory,. Observatory, Cape.

OCCULTATIONS - Mr A.G.F. Morrisby, Dept. of Surveyor General, P.O. Box 8099, Causeway, Salisbury, Rhodesia. Coordinator for Grazing Occultations - Mr. M.D. Overbeek, 60 Edward Drive, Edenvale, Tvl.