OCTOBER LECTURE-THE MAYAN CALENDAR

The Mayan calendar was more accurate than our modern Gregorian one by three ten thousandths of a day per tropical year. So stated our October Speaker, Dr. John J. Ruiz of the American Assn. of Variable Star Observers. The Mayan century consisted of 52 Haabs or years of 365 days. These centuries also contained 73 Tzolkins or years of 260 days each. The new century began when a new Haab and a new Tzolkin began on the same day. The Mayans also made a very accurate determination of the synodic period of Venus.

The Mayans, whose civilization in the Yucatan penisula of Mexico reached its zenith from 700 to 1000 A.D., invented the number zero a thousand years before the Hindu mathematicians. This number was written as a shell. The other Mayan numbers consisted of dots and horizontal lines. For example, three dots in a row denoted the number 3, and 9 was indicated by .... in their system of numbers. Their numbers carried on 20 instead of ten as in our decimal system. Dr. Ruiz demonstrated arithmetic operations with these Mayan numbers. The numerical procedures are awkward, but correct answers were obtained.

Finally Dr. Ruiz reminisced about his visit to the observatory of his old friend Domingo Taboada of Puebla, Mexico, who is also an active A.A.V.S.O. member.

- Leith Holloway

* STAR DUST *

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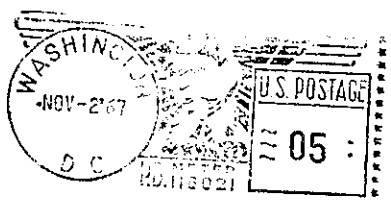

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* STAR DUST *

November 1967 Vol. XXV, No. 3

MARINER V FLY-BY

Oran W. Nicks

November's speaker will be Mr. Oran W. Nicks, Director of Lunar and Planetary Programs, Office of Space Science & Applications, N.A.S.A. Mr. Nicks will present a timely and authoritative account of Mariner V which is just now completing its Venus fly-by. Though perhaps up-staged by its spectacular fellow-traveler, Mariner nonetheless is carrying out a valuable program of fundamental importance to science. Some of the experiments being conducted include particle detectors and a magnetometer for mapping out the solar wind and interplanetary magnetic fields along its course and ultraviolet sensors for detecting and measuring amounts of hydrogen and oxygen in Venus' atmosphere, to be used to determine temperatures in the upper atmosphere. There will be radio transmission experiments--one an occultation experiment to attempt to obtain a density profile of the atmosphere--another to measure a transmitted radio signal from the earth to Mariner to compare phase shifts of two different frequencies and thereby determine the abundance of interplanetary electrons. Geiger-Müller tubes will sample radiation near the planet, in search of radiation belts corresponding to our own Van Allen belts. Mr. Nicks will be able to report some preliminary findings of the probe.

- Continued on page 2 -

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CALENDAR

NOVEMBER 4 MARINER V FLY-BY. Speaker: Mr. Oran W. Nicks. Dept. of Commerce Auditorium, 8:15 P.M.

4 DINNER WITH THE SPEAKER at 6:00 P.M. at Bassin's (14th & Pennsylvania Avenue). For reservations, call Jerry Hudson, 948-2809 prior to noon, Saturday.

12 PG COUNTY JUNIORS, 2:00 P.M. Home of Ted Noble.

18 MD-DC JUNIORS MEETING at 2:00 P.M. at the Chevy Chase Library, 8005 Connecticut Ave., Chevy Chase. More Activity planning. Please note that this meeting is a week later than usual because the second Saturday of this month falls on Veterans' Day during which the Library is closed.

18 DISCUSSION GROUP, Room 2062 Dept. of Commerce. Bob Wright will lead a discussion on Messier objects, together with a slide presentation.

3,10,17, 24 TELESCOPE MAKING CLASSES at the Chevy Chase Community Center. 7:30 P.M.

Oran W. Nicks—Continued from page 1.

Mr. Oran W. Nicks was appointed Deputy Associate Administrator for Space Science and Applications on October 19, 1967. He was Director of the Voyager Program and Acting Director of Lunar and Planetary Programs from February '67 to October '67. Prior to that, he was Director of Lunar and Planetary Programs from November 1961 to February 1967. He came to NASA in March 1960 from Vought-Astronautics, Dallas, Texas, where he had served as Project Engineer for Advanced Space Systems.

In 1964, Mr. Nicks received the NASA Exceptional Service Award for directing the Ranger efforts which led to the first high-resolution photographs of the Moon. In 1965, he received the NASA Leadership Award for his direction of the Mariner Program.

From 1948-1958, he was with North American Aviation where he was engaged in structures, aerodynamics, thermodynamics, and project management activities.

He received an A.A. degree in Aeronautical Engineering from Spartan College in 1943, and a B.S. degree in Mechanical Engineering (Aeronautical Option) from the University of Oklahoma in 1948. He continued graduate studies at the University of Southern California, Los Angeles, from 1949 through 1957.

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NEW MEMBERS — APPLICATIONS RECEIVED AT THE OCTOBER MEETING

REGULAR	JUNIOR
Harry J. Hall 131-13 Fernedge Rd. Silver Spring, Md. 20906	Richard Blake 6607 Chesterfield Ave. McLean, Va. 22101
George H. Kelso 3506 56th Place Cheverly, Md. 20784	Joseph B. Jordan, Jr. 6426 Noble Drive McLean, Va. 22101

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OCCULTATION PREDICTIONS

A valuable service can be performed by the amateur with modest equipment in a regular program of timing lunar occultations. In hope of interesting more N.C.A. members in this practice, we are including predictions supplied by the the U.S. Naval Observatory.

The use of the table is self-explanatory, with possibly the following explanations needed:

Z.C.= Zodiacal Catalogue number. If followed by "M", take the mean time of the appearance (disappearance) of the double star. For any other letter, use the brighter component of the pair.

Some Z.C. numbers have been assigned to bright Solar System objects:

Mercury.....	4001	Uranus.....	4007
Venus.....	4002	Neptune.....	4008
Mars.....	4004	Ceres.....	5001
Jupiter.....	4005	Pallas.....	5002
Saturn.....	4006	Juno.....	5003

Vesta.....5004

PHEN= Phenomenon D= Disappearance R=Reappearance *=Near Graze

P.A. DEG=Position Angle (degrees), measured eastward from the northernmost point on the moon's disc. For example, 90° would be the center of the dark limb during waxing; 270° during waning.

P.A.C.B.L.=Position Angle of the Center of the Bright Limb.(same convention)

Altitudes of the sun and moon are only given when these are important.

LUNAR OCCULTATIONS COMPUTED FOR WASHINGTON
(LAT 38.920 LONG 77.065) FOR 1967
STANDARD STATION AT LAT 38.920 LONG 77.065

DATE	TIME(UT) H	M	S	Z.C.	MAG	SP	PHEN	PERCENT SUNLIT	P.A. DEG	P.A. C.B.L.	MOON ALT	MOON AZI	SUN ALT	SUN A.A. DEG	LIBRATIONS LONG	LIBRATIONS LAT
OCT 15	3	15	31	3409	7.0	K0	D	90	WAX	60	241					
OCT 15	5	38	54	3419	4.5	K0	D	91	WAX	84	242					
OCT 16	5	10	17	3526	5.1	K0	D	96	WAX	80	240					
OCT 16	7	41	21	3535	5.2	B8	D	96	WAX	101	240	19	249			
OCT 16	7	57	51	3537	6.8	A3	D	96	WAX	93	240	16	252			
OCT 16	23	41	3	4006	0.6		D	98	WAX	80	237	19	106			
OCT 17	0	45	53	4006	0.6		R	98	WAX	210	237				232	3.2 3.1
OCT 20	3	22	17	416	5.4	B5	R	97	WAN	279	70				294	-1.1 -1.5
OCT 20	8	38	35	432	5.9	M3	R	97	WAN	250	69				265	-2.2 -2.0
OCT 21	9	37	52	540	8.1	A0	R*	93	WAN	307	73				318	-3.7 -3.4
OCT 22	1	22	2	649	7.2	F5	R	88	WAN	271	77	14	69			
OCT 22	1	31	19	652	6.4	B8	R	88	WAN	238	77	15	71			
OCT 22	6	28	10	683	7.3	A2	R	87	WAN	248	78					
OCT 22	10	3	23	698	7.6	K2	R	87	WAN	296	78					
OCT 24	3	25	38	952	8.0	K2	R	73	WAN	309	89	19	69			
OCT 24	8	30	41	979	7.7	A0	R	71	WAN	260	90					
OCT 25	3	1	37	1088	5.6	A2	R	63	WAN	204	96	5	59			
OCT 25	3	49	41	1093M	6.4	F5	R	63	WAN	296	96	14	66			
OCT 26	6	2	9	1244	8.9	M5	R*	52	WAN	210	102					
OCT 27	8	11	51	1373	6.1	A0	R	41	WAN	307	108					
OCT 30	9	48	14	1722	8.1	A0	R	11	WAN	287	117	17	100			
NOV 4	22	44	6	2474	6.6	F2	D	11	WAX	36	281	9	223	-8		
NOV 6	23	26	58	2831	5.9	B3	D	29	WAX	30	265	18	207			
NOV 9	2	57	58	3130	5.5	K0	D	51	WAX	38	252	11	231			
NOV 10	4	6	19	3265	6.6	G5	D*	61	WAX	350	248	12	238			
NOV 11	1	47	11	3368	8.9	F5	D	70	WAX	8	246					
NOV 12	4	4	16	3497	8.9	K2	D	79	WAX	2	244					
NOV 12	6	16	32	3503	7.4	A2	D	79	WAX	6	244	12	254			
NOV 12	23	51	29	48	8.4	K0	D	85	WAX	82	244					
NOV 13	7	40	17	67	8.4	F2	D*	87	WAX	355	245	7	266			
NOV 13	23	47	3	155	6.8	F2	D*	91	WAX	122	245					
NOV 14	1	58	55	167	5.7	F0	D	92	WAX	70	246					
NOV 14	7	34	59	184	6.2	K0	D	93	WAX	39	246	19	263			
NOV 15	1	31	22	272	5.9	F0	D	96	WAX	45	249					
NOV 15	4	44	19	284	7.4	K0	D*	96	WAX	134	249					
NOV 15	4	58	13	284	7.4	K0	R*	96	WAX	153	249				172	0.7 -0.0
NOV 15	8	19	13	290	6.1	A2	D	97	WAX	80	250					
NOV 16	10	57	39	416	5.4	B5	D	99	WAX	95	261	3	290	-11		
NOV 18	23	48	52	745	8.0	G5	R	97	WAN	252	75	11	65		257	-3.2 -4.4
NOV 19	2	55	47	762	6.6	B5	R	96	WAN	254	76				258	-3.4 -4.8
NOV 20	2	58	16	909	6.1	B8P	R	92	WAN	246	84				246	-4.3 -5.6
NOV 21	2	25	44	1056	7.0	B9	R	86	WAN	240	91					
NOV 24	7	11	59	1444	7.8	K0	R	57	WAN	305	109					
NOV 25	5	29	44	1553	7.5	A0	R	47	WAN	286	112	8	80			
NOV 27	9	31	23	1782	8.9	G0	R	24	WAN	268	114					
DEC 6	23	15	6	3202	6.1	F2	D	32	WAX	85	252					
DEC 7	2	35	20	3214	6.6	A0	D	33	WAX	106	252	5	242			
DEC 9	1	54	14	3457	8.1	G5	D*	53	WAX	125	247					
DEC 9	21	56	31	13	6.3	K0	D	62	WAX	79	246			-2		
DEC 9	22	31	46	15	7.3	G5	D	62	WAX	57	246			-9		
DEC 10	2	26	23	22	7.3	K0	D	63	WAX	38	246					
DEC 10	22	25	49	109	6.5	G5	D	71	WAX	70	246			-8		
DEC 11	22	30	37	228	8.8	F5	D	79	WAX	44	248			-8		
DEC 12	5	47	13	252	7.4	A2	D*	81	WAX	124	249					
DEC 13	0	3	31	342	8.0	K0	D	87	WAX	94	251					
DEC 13	6	57	3	366	8.8	G5	D	88	WAX	90	253					
DEC 14	2	25	31	460	7.0	A0	D	93	WAX	90	257					
DEC 14	4	7	31	465	4.5	K0	D	93	WAX	76	258					
DEC 14	9	14	40	481	8.3	A2	D	94	WAX	92	258	9	289			
DEC 15	1	16	26	584	6.0	B9	D	97	WAX	38	265					
DEC 15	8	54	35	611	7.0	K2	D	97	WAX	79	268					
DEC 17	6	42	5	890	4.5	A0	D	100	WAN	112	40					
DEC 17	8	1	58	890	4.5	A0	R	100	WAN	253	40				253	-4.5 -5.6
DEC 18	11	7	34	1056	7.0	B9	R	98	WAN	274	81				268	-5.4 -6.0
DEC 21	3	9	26	1400	8.2	F5	R*	82	WAN	218	105	18	79			
DEC 21	7	46	25	1417	8.7	G5	R	81	WAN	298	105					
DEC 22	11	3	7	1545	7.9	F2	R	71	WAN	298	110					
DEC 23	5	24	53	1625	5.9	K0	R	63	WAN	253	112	19	94			
DEC 23	10	11	7	1646	8.1	K0	R	61	WAN	340	113			-5		
DEC 23	11	56	50	1648	7.0	G5	R	61	WAN	289	113					
DEC 24	5	58	25	1740	7.6	A2	R	52	WAN	234	113	12	98			
DEC 24	11	53	14	1757	9.2	G5	R	50	WAN	330	113			-6		

* NEAR GRAZE AT STANDARD STATION, TIME IS FOR STANDARD STATION, NOT FOR WASHINGTON