Appendix 1

IAU Mercurian Nomenclature

1. IAU Nomenclature Rules

Since its inception in Brussels in 1919 [1], the International Astronomical Union (IAU) has gradually developed a planetary nomenclature system that has evolved from a purely classically based system into a quite sophisticated attempt to broaden the cultural base of the names approved for planetary bodies and surface features. At present, name selection is guided by 11 rules (quoted verbatim below) in addition to conventions decided upon by nomenclature task groups for individual Solar System bodies. The general rules are as follows[1]:

1. Nomenclature is a tool and the first consideration should be to make it simple, clear, and unambiguous.
2. In general, official names will not be given to features whose longest dimensions are less than 100 metres, although exceptions may be made for smaller features having exceptional scientific interest.
3. The number of names chosen for each body should be kept to a minimum. Features should be named only when they have special scientific interest, and when the naming of such features is useful to the scientific and cartographic communities at large.
4. Duplication of the same surface feature name on two or more bodies, and of the same name for satellites and minor planets, is discouraged. Duplications may be allowed when names are especially appropriate and the chances for confusion are very small.
5. Individual names chosen for each body should be expressed in the language of origin. Transliteration for various alphabets should be given, but there will be no translation from one language to another.
6. Where possible, the themes established in early solar system nomenclature should be used and expanded on.
7. Solar system nomenclature should be international in its choice of names. Recommendations submitted to the IAU national committees will be considered, but final selection of the names is the responsibility of the International Astronomical Union. The WGPSN strongly supports equitable selection of names from ethnic groups/countries on each map; however, a higher percentage of names from the country planning a landing is allowed on landing site maps.
8. No names having political, military or religious significance may be used, except for names of political figures prior to the nineteenth century.

[1]Reproduced with the kind permission of the IAU and the USGS Astrogeology Science Center (`http://planetarynames.wr.usgs.gov/Page/Rules`). Retrieved 2011 July 26.

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

9. Commemoration of persons on planetary bodies should not normally be a goal in itself, but may be employed in special circumstances and is reserved for persons of high and enduring international standing. Persons being so honored must have been deceased for at least three years.
10. When more than one spelling of a name is extant, the spelling preferred by the person, or used in an authoritative reference, should be used. Diacritical marks are a necessary part of a name and will be used.
11. Ring and ring-gap nomenclature and names for newly discovered satellites are developed in joint deliberation between WGPSN and IAU Commission 20. Names will not be assigned to satellites until their orbital elements are reasonably well known or definite features have been identified on them.

2. Naming Conventions

In addition to these rules, individual task groups take the following guidelines into account[2]:

1. Names for all planetary features include a descriptor term, with a few exceptions. For craters, the descriptor term is implicit. Some features named on Io and Triton do not carry a descriptor term because they are ephemeral.
2. In general, the naming convention for a feature type remains the same regardless of its size. Exceptions to this rule are channels (valles) on Mars and craters on the Moon, Mars, and Venus; naming conventions for these features differ according to size. The categories for naming features on each planet or satellite (and the exceptions) are listed in Categories for Naming Features on Planets and Satellites. One feature classification, regio, was originally used on early maps of the Moon and Mercury (drawn from telescopic observations) to describe vague albedo features. It is now also used to delineate a broad geographic region.
3. Named features on bodies so small that coordinates have not yet been determined are identified on drawings or images of the body that are included in the IAU Transactions volume of the year when the names were adopted. Satellite rings and gaps in the rings are named for scientists who have studied these features; drawings that show these names are also included in the pertinent Transactions volume. Names for atmospheric features are informal at present; a formal system will be chosen in the future.
4. The boundaries of many large features (such as terrae, regiones, planitiae, and plana) are not topographically or geomorphically distinct; the coordinates of these features are identified from an arbitarily chosen center point. Boundaries (and thus coordinates) may be determined more accurately from geochemical and geophysical data obtained by future missions.

[2]Reproduced with the kind permission of the IAU and the USGS Astrogeology Science Center (http://planetarynames.wr.usgs.gov/Page/Rules). Retrieved 2011 July 26.

5. During active missions, small surface features are often given informal names. These may include landing sites and small topographic features, such as craters, hills, and rocks. Such names will not be given official status by the IAU, except as provided for by Rule 2 above. As for the larger objects, official names for any such small features would have to conform to established IAU rules and categories.

   When a satellite has been discovered through the efforts of a large scientific team, the list of individual team members may be too long to include all contributors. In such cases, credit for the discovery will go to the science team.

2.1. IAU Descriptor Terms

Seven types of descriptor terms (types of surface features) are used in Mercurian nomenclature: craters (circular depressions whose boundaries are marked by elevated ramparts), *dorsa* (ridges), *fossae* (long, narrow depressions), *montes* (mountains), *planitiae* (extensive low plains), *rupēs* (scarps) and *valles* (channels). Lowell [2,3,4,5] introduced over two dozen *regiones*, which he recorded as streak-like markings similar to those he thought that he saw on Mars. Since Lowell's *regiones* are spurious, they are mentioned here (and listed in the Gazetteer section) for completeness and historical interest only. Not included in the IAU nomenclature system, but nevertheless still very much a part of Mercurian cartography, are the *solitudines* ('deserts', denoting various light and dark albedo features on the Mercurian surface), introduced by Antoniadi [6].

2.2. IAU Categories

Under the IAU planetary nomenclature system each planet is allotted a set of themes ('categories') for the naming of its surface features. In the case of Mercury, the IAU naming conventions are listed in Table 1. Craters are named after distinguished deceased artists, musicians and writers who have been recognized for more than 50 years as having made significant contributions in their fields. Dorsa commemorate deceased scientists who have contributed work on Mercury. Fossae bear the names of culturally significant works of architecture. Planitiae are given names for Mercury in various languages. Rupēs are named after ships of discovery or vessels that have participated in scientific expeditions and valles after radio observatories.

Although not included in the USGS Gazetteer of Planetary Nomenclature, the solitudines ('deserts') are still employed (but modified in Dollfus's map; see Fig. 3).

3. How Names Are Approved

Anyone may suggest a name for a planetary surface feature for consideration by the relevant task group. Names that successfully meet TG criteria are forwarded to the IAU's Working Group for Planetary System Nomenclature (WGPSN). Once the WGPSN has given its approval a name is entered into the U.S. Geological Survey Gazetteer of Planetary Nomenclature (which is the IAU's official planetary nomenclature database) and may be used in maps and publications produced by the scientific community. Themes (called 'categories' in the IAU nomenclature system) are considered by members of the WGPSN task group concerned as soon as new images of a planetary surface are received. Subsequently, planetary scientists and cartographers may continue to suggest new names for features as higher resolution images become available.

4. The Working Group for Planetary System Nomenclature (WGPSN)

The present membership of the Working Group for Planetary System Nomenclature is listed in Table 2.

5. The Task Group for Mercury Nomenclature

The current membership of the Task Group for Mercury Nomenclature is listed in Table 3.

6. IAU Codification Parameters

Most of the entries in the gazetteer section end with an IAU codification in the format $a : b : c : d : e : f : g : [h]$, . the parameter values being defined as follows:

- a: a one-letter code for the parent planet (see Table 4)
- b: a two-letter code for a satellite (see note below)
- c: a two-letter code for feature type (Table 5)
- d: a two-letter code for continent (Table 6)
- e: a two-letter code for ethnicity (Table 7)
- f: a one-digit numeral (1–7) for IAU status (see Table 8)
- g: a four-digit year of acceptance by the IAU (before mid-September 2006); date in format YYYY Mon DD thereafter
- h: a numbered bibliographic source in brackets

Notes

Parameter *b* does not apply to Mercury, which has no satellites, so this part of the code contains an en-dash.

Parameter *c* represents the **descriptor term**. A list of descriptor terms used for Mercurian nomenclature is given in Table 5.

Parameter *d* indicates the geographical origin of the name (by continent), as shown in Table 6.

Parameter *e* indicates either a country or ethnic group, as listed in Table 7. Note that the codes are not unique to a given country or ethnicity; 'SY', for example, applies to both Syria (Asia) and Scythia (Europe), so the continent code must always be given with the country/ethnicity code to avoid ambiguity.

Parameter *f* denotes the status of a name within the IAU nomenclature scheme. As many as seven levels of IAU approval have been used over time (see Table 8). Note that levels 1–4 are not currently used. Prior to mid-September 2006 only the year of approval (parameter g) is listed by the USGS Gazetteer of Planetary Nomenclature.[3] From mid-September 2006 onwards the full date of approval is listed in that website in the format YYYY-MM-DD; however, in this work we use the convention YYYY-Mon-DD in order to avoid possible confusion of months and days for DD $<$ 12. For example, '2010-03-03' in the USGS website is listed in this gazetteer as '2010 Mar 03'.

A **question mark** following a parameter indicates a possible error in the USGS data base.

7. Mercurian Nomenclature Update [7]

This edition of the gazetteer is complete up to 2012 December 19. Since then the following additions and modifications have been made to the USGS data base:

i. On Friday, 2013 March 15, new names were approved for the following nine craters: *Alver, Donetaitis, Flaiano, Hurley, L'Engle, Lovecraft, Pahinui, Petöfi* and *Roerich*.

ii. On Tuesday, 2013, March 26, the WGPSN approved the following changes to the Mercurian nomenclature system:

   a. *Arecibo Vallis, Goldstone Vallis, Haystack Vallis* have been changed to *Arecibo Catena, Goldstone Catena* and *Haystack Catena*, respectively.

   b. The name *Simeiz Vallis* has been dropped.

   c. For Mercury, *catenae* now commemorate radio telescope facilities, and *valles* are now the theme for abandoned settlements, towns and cities in antiquity.

iii. On Tuesday, 2013 April 30, new names were approved for the following valles: *Angkor Vallis, Cahokia Vallis, Caral Vallis, Paestum Vallis* and *Timgad Vallis*.

iv. On Monday, 2013 June 3, the following new *rupēs* were approved for Mercury: *Alvin Rupes, Belgica Rupes, Calypso Rupes, Carnegie*

[3] http://planetarynames.wr.usgs.gov/

Rupes, Duyfken Rupes, Eltanin Rupes, Enterprise Rupes, Nautilus Rupes, Palmer Rupes and *Terror Rupes.*

v. On Thursday, 2013 June 13, the new crater name *Duccio* was approved.

vi. On Monday, 2013 June 17, the following nine new crater names were approved: *Bechet, Damer, David, Erté, Larrocha, Laxness, Monk, Rikyū* and *Varma.*

vii. On Tuesday, 2013 June 25, the new crater name *Fuller* was approved.

Full coverage of these and any future additions to the USGS data base must wait until the next edition of this volume.

Table 1. Categories Pertinent to Mercury

Descriptor term	*Description*
Craters	Deceased artists, musicians and writers of established reputation who have made significant contributions in their fields and whose importance has been recognized for at least 50 years
Dorsa	Deceased scientists who have contributed to the study of Mercury
Fossae	Culturally significant works of architecture
Montes	The word for ‘hot’ in various languages
Planitiae	Names for the god or planet Mercury in various languages
Regiones	Occasionally used to denote vague albedo features
Rupēs	Ships that have made voyages of discovery or which have formed part of a scientific expedition
Solitudines[a]	Albedo features
Valles	Radio observatories

[a]Not a recognized IAU descriptor term but still used in cartography.

Table 2. CURRENT MEMBERSHIP OF THE WGPSN[a]

Position	*Name*	*Country represented*
Chair	R. Schulz	Netherlands
Member	K. Aksnes	Norway
Member	J. Blue	USA
Member	G. A. Burba	Russia
Member	G. Consolmagno	Vatican City State
IAU Commission 16 representative	M. Lemmon	USA
Member	R. Lopes	UK
Member	P. Masson	France
Member	B. A. Smith	USA
IAU Division F representative	G. Valsecchi	Italy
Minor Planet Center and IAU Small Bodies Nomenclature representative	G. Williams	USA
Member	C. Wood	USA

[a] http://planetarynames.wr.usgs.gov/Page/Members, retrieved 2013 August 29.

Table 3. CURRENT MEMBERSHIP OF THE TASK GROUP FOR MERCURY NOMENCLATURE[a]

Position	*Name*	*Country represented*
Chair	P. Masson	France
Member	D. B. Campbell	USA
Member	A. C. Cook	UK
Member	K. Kuramoto	Japan
Member	J. Rodionova	Russia
Member	R. Ziethe	Netherlands

[a] http://planetarynames.wr.usgs.gov/Page/Members, retrieved 2013 August 29.

Table 4. IAU CODES FOR PRIMARY PLANETS AND ASTEROIDS

Code	*Body*	*Code*	*Body*
A	asteroid	N	Neptune
E	Earth	S	Saturn
H	Mercury (Hermes)	U	Uranus
J	Jupiter	V	Venus
M	Mars		

Table 5. IAU descriptor term codes for Mercury

Code	*Descriptor term*	*Code*	*Descriptor term*
AL	albedo feature	PL	planitia
AA	crater	RE	regio
DO	dorsum	RU	rupes
FO	fossa	VA	vallis
MO	mons		

Table 6. IAU continent codes

Code	*Continent*	*Code*	*Continent*
AF	Africa feature	NA	North America
AN	Antarctica	OC	Oceania
AS	Asia	SA	South & Central America
EU	Europe		

Table 7.: IAU country and ethnic group codes

Africa (AF)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	GH	Ghana	NM	Namibia
AL	Algeria	GU	Guinea	PY	Pygmy
AN	Angola	HO	Hottentot	RW	Rwanda
BA	Bantu	IC	Ivory Coast	SA	South Africa
BE	Benin	KY	Kenya	SE	Semitic
BF	Burkina Faso (Upper Volta)	LB	Libya	SL	Sierra Leone
		LE	Lesotho	SN	Senegal
BH	Bushongo	LI	Liberia	SO	Somalia
BR	Burundi	MA	Mauritius	SU	Sudan
BT	Botswana	MB	Mbundu	SW	Swaziland
BU	Bushman	MD	Madagascar	SY	Rep. Seychelles
CH	Rep. Chad	ME	Mende	TA	Tanzania
CI	Canary Is.	ML	Mali	TN	Tunisia
CR	Cameroon	MN	Mande	TO	Togo
DH	Dahomean	MR	Morocco	UG	Uganda
EG	Egypt	MU	Mauritania	YA	Yao
ET	Ethiopia	MW	Malawi	ZA	Zaire
GA	Gambia	MZ	Mozambique	ZI	Zimbabwe
GB	Gabon	NG	Niger	ZM	Zamba
GC	Gold Coast	NI	Nigeria	ZU	Zulu

Table 7.: IAU COUNTRY AND ETHNIC GROUP CODES

Antarctica (AN)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	AM	America (Antarctica)	FR	France (Antarctica)

Asia (AS)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	IR	Iran	PE	Persian
AB	Assyro–Babylonian	IS	Israel	PH	Philippines
AF	Afghanistan	IT	Itelmen	PK	Pakistan
AK	Akkadian (Accadian)	JA	Japan	PO	Phoenician
		JO	Jordan	SA	Sanskrit
AL	Altai	JW	Jewish	SB	Saudi Arabia
AM	Armenian	KA	Kashmir	SC	Scythian
AR	Arabian	KR	Korea	SE	Semitic
AY	Assyrian	KT	Ket	SI	Siberia
AZ	Azerbaijan	KU	Kuwait	SR	Sri Lanka
BA	Bangladesh	KY	Kyrgyzstan	SU	Sumerian
BH	Bhutan	KZ	Kazakhstan	SY	Syria
BR	Buriat	LA	Laos	TB	Tibet
BU	Burma	LE	Lebanon	TH	Thailand
BY	Babylon	MA	Malaysia	TJ	Tajik
CH	China	ME	Mesopotamian	TK	Turkmenistan
CM	Cambodia	MG	Monguor	TN	Tungu
CU	Chukchi	MO	Mongolia	TU	Turkey
EL	Elamite	MS	Mansi	TV	Tuva
EV	Evenki	NA	Nanai	TW	Taiwan
GE	Georgia	MY	Minyong	UL	Ulci
HE	Hebrew	NE	Nepal	UR	Urartu
HI	Hindu	NG	Neghidhian	UZ	Uzbekistan
ID	Indonesian	NS	Nganasan	VT	Vietnam
IN	India	OM	Oman	YE	Yemen
IQ	Iraq	OS	Ostyak	YK	Yakutian

Table 7.: IAU country and ethnic group codes

Europe (EU)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	GB	Great Britain	NS	Norse
AL	Albania	GE	Germany	OG	Ostrogoth
AN	Andorra	GL	Greenland	OS	Oscan
AS	Austria	GR	Greek	PG	Portugal
BE	Belgium	GY	Gypsy	PO	Poland
BH	Bosnia-Herzogovina	HU	Hungary	RM	Roman
BL	Belarus	IC	Iceland	RO	Romania
BS	Bashkir	IR	Ireland	RU	Russia
BU	Bulgaria	IT	Italy	SC	Scotland
BZ	Byzantine	KA	Karelia	SD	Scandinavia
CC	Caucasus	KL	Kalmyk	SI	Slovenia
CE	Celtic	KO	Komi	SL	Slavic
CH	Chuvash	LA	Latin	SM	San Marino
CR	Croatia	LE	Liechtenstein	SO	Soviet
CY	Cyprus	LI	Lithuania	SP	Spain
CZ	Czechoslovakia	LP	Lapp	SV	Slovakia
DE	Denmark	LU	Luxembourg	SW	Sweden
DU	Netherlands (Dutch)	LV	Latvia	SY	Scythia
EK	Eskimo (Greenland)	MA	Macedonia	SZ	Switzerland
EN	England	MD	Moldova	TT	Tartar
ES	Estonia	ML	Malta	TU	Teutonic
FI	Finland	MO	Mordvinian	UD	Udmurtian
FL	Flemish	MR	Mari	UK	Ukraine
FR	France	NO	Norway	WA	Wales
				YU	Yugoslavia

North America (NA)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	CR	Creek	OS	Osage
DA	Dakota	CU	Chumash	PE	Pequot
AB	Aruba	CY	Cheyanne	PO	Polawatomi
AL	Algonquin	DA	Dakota	PU	Pueblo
AM	American	DO	Dominica	PW	Pawnee
AR	Arkara	ES	Eskimo	SA	Salish
AU	Aleutian	HO	Hopi	SE	Seneca
BL	Blackfoot	IR	Iroquois	SH	Shoshoni
CA	Canada	KL	Klamath	SX	Sioux
CE	Cherokee	LA	Lakota	TL	Tingit
CH	Chickasaw	MA	Mandan	US	United States
CI	Chinook	ME	Mexico	ZU	Zuni
CO	Choktaw	NV	Navajo		

Table 7.: IAU country and ethnic group codes

Oceania (OC)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	MA	Marquesas Is.	PA	Rep. Palau
AU	Australia	MC	Micronesia	PN	Papua New Guinea
CI	Caroline Is.	ME	Melanesia	PO	Polynesia
CO	Cook Is.	MI	Marshall Is.	SA	Samoa
FJ	Fiji	NA	Nauru	SI	Society Is.
GM	Guam	NB	New Britain	TO	Tonga
GU	New Guinea	NC	New Caledonia	TU	Toamotu
HA	Hawaii	NZ	New Zealand	VA	Vanuatu

South and Central America (SA)

Code	*Ethnicity*	*Code*	*Ethnicity*	*Code*	*Ethnicity*
–	unknown	DR	Dominican Rep.	NI	Nicaragua
AC	Auracanian	EC	Ecuador	PA	Paraguay
AR	Argentina	ES	El Salvador	PE	Peru
AZ	Aztec	FG	French Guiana	PM	Panama
BB	Barbados	FI	Falkland Is.	PR	Puerto Rico
BO	Bolivia	GR	Grenada	RR	Bororo
BR	Brazil	GU	Guatemala	SU	Suriname
CH	Chile	GY	Guyana	UR	Uruguay
CI	Chimalateco	HA	Haiti	VE	Venezuela
CO	Colombia	HO	Honduras	VI	Virgin Is.
CR	Costa Rica	IN	Inca		
CU	Cuba	JM	Jamaica		
DA	Netherland	MY	Mayan		
	(Dutch) Antilles	NA	Nahuatl		

Source: http://planetarynames.wr.usgs.gov/Page/Specifics. Retrieved 1 August, 2011.

Table 8. Levels of IAU approval

Code	*Approval Level*
1	Proposed
2	Approved by Task Group
3	Approved by the Working Group for Planetary System Nomenclature
4	Approved by the IAU's Executive Committee
5	Adopted by the IAU
6	Dropped, no longer in use
7	Never approved by the IAU

Appendix 2

Non-roman Alphabets

Arabic

Letter				Name		Transliteration
Isolated	*Initial*	*Medial*	*Final*			*(DIN)*
ا			ـا	الف	(alif)	**ā**
ب	بـ	ـبـ	ـب	باء	(bā’)	**b**
ت	تـ	ـتـ	ـت	تاء	(tā’)	**t**
ث	ثـ	ـثـ	ـث	ثاء	(ṯā’)	**ṯ**
ج	جـ	ـجـ	ـج	جيم	(jīm)	**ğ**
ح	حـ	ـحـ	ـح	حاء	(ḥā’)	**ḥ**
خ	خـ	ـخـ	ـخ	خاء	(ḵā’)	**ḫ**
د			ـد	دال	(dāl)	**d**
ذ			ـذ	ذال	(ḏāl)	**ḏ**
ر			ـر	راء	(rā’)	**r**
ز			ـز	زاء	(zā’)	**z**
س	سـ	ـسـ	ـس	سين	(sīn)	**s**
ش	شـ	ـشـ	ـش	شين	(šīn)	**š**
ص	صـ	ـصـ	ـص	صاد	(ṣād)	**ṣ**
ض	ضـ	ـضـ	ـض	ضاد	(ḍād)	**ḍ**
ط	طـ	ـطـ	ـط	طاء	(ṭā’)	**ṭ**
ظ	ظـ	ـظـ	ـظ	ظاء	(ẓā’)	**ẓ**
ع	عـ	ـعـ	ـع	عين	(‘ayn)	**‘**
غ	غـ	ـغـ	ـغ	غين	(g̣ayn)	**g̣**
ف	فـ	ـفـ	ـف	فاء	(fā’)	**f**
ق	قـ	ـقـ	ـق	قاف	(qāf)	**q**
ك	كـ	ـكـ	ـك	كاف	(kāf)	**k**
ل	لـ	ـلـ	ـل	لام	(lām)	**l**
م	مـ	ـمـ	ـم	ميم	(mīm)	**m**
ن	نـ	ـنـ	ـن	نون	(nūn)	**n**
ه	هـ	ـهـ	ـه	هاء	(hā’)	**h**
و			ـو	واو	(wāw)	**w**,**ū**
ي	يـ	ـيـ	ـي	ياء	(yā’)	**y**,**ī**

Notes. — 1. All Arabic names in this gazetteer are given unvocalized; i.e. the three short vowels (*a*, *i* and *u*) are not shown in the Arabic spelling, as is the

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

norm in Modern Standard Arabic (MSA) printing (e.g. Schulz, Krahl & Reuschel 2000).

2. Long vowels are always indicated in unvocalized script. The long vowels of MSA are: *'alif* (ا), *'alif maqṣūrah* (ى), *wāw* (و) and *yā'* (ي). The short vowels that would accompany these letters in vocalized text are implied when unvocalized.

3. *Gemination (consonant doubling):* The doubling of consonants is represented by the *šaddah* (شدّه), a 'w'-shaped placed over the consonant to be doubled.

4. *The hamzah:* This symbol (ء) represents a glottal stop, an important phoneme in Arabic, and can be written either alone (rarely) or (more usually) acting as a diacritic symbol when combined with another letter:

- أ and إ : above or under an *'alif* to represent the glottal stop (preceding an initial short *a* or *i* respectively);
- ؤ : above a *wāw*; or
- ئ : above a dotless *yā'* (the *yā' hamzah*).

5. Three of the standard letters are modified to produce the following common variants:

- *'alif maddah* (transliterated *'ā*): آ (independent), آ (initial), ـآ (medial), ـآ (final);
- *tā' marbūṭah* (transliterated *a*): ة (independent), ـة (final)—always at the end of a word; and
- *'alif maqṣūrah* (transliterated ā or *y*): ى (independent), ـى (final).

6. *Ligatures:* In Arabic script, there are a number of combinations of letters that are joined to form so-called *ligatures*, the only compulsory one being ل + ا to produce لا (independent), ـلا (intermediate and final).

Attic Greek

Letter		*Name*	*Transliteration*	*Letter*		*Name*	*Transliteration*
Α	α	alpha	**a**	Ν	ν	nu	**n**
Β	β	beta	**b**	Ξ	ξ	xi	**x**
Γ	γ	gamma	**g**	Ο	ο	omicron	**o**
Δ	δ	delta	**d**	Π	π	pi	**p**
Ε	ε	epsilon	**e**	Ρ	ρ	rho	**rh**
Ζ	ζ	zeta	**z**	Σ	σ,ς	sigma	**s**
Η	η	eta	**ē**	Τ	τ	tau	**t**
Θ	ϑ	theta	**th**	Υ	υ	upsilon	**u**
Ι	ι	iota	**i**	Φ	φ	phi	**ph**
Κ	ϰ	kappa	**k**	Χ	χ	chi	**kh**
Λ	λ	lambda	**l**	Ψ	ψ	psi	**ps**
Μ	μ	mu	**m**	Ω	ω	omega	**ō**

Notes. — 1. Initial vowels may be either aspirated or unaspirated. Aspiration is denoted by the symbol ʿ above a lower case vowel (before a capital) and unaspirated vowels carry the symbol ʾ above (if lower case) or before it (if capital). 2. The supposed aspiration of the consonants theta, rho, phi and chi are respected in the transliterations of this gazetteer, as are the distinctions between long/short eta/epsilon and omega/omicron.

The Devanagari Syllabary

Vowels

Letter	*Name*	*Transliteration*	*Letter*	*Name*	*Transliteration*
अ	*a*	**a**	ॠ	*ṝ*	**ṝ**
आ	*ā*	**ā**	ऌ	*ḷ*	**ḷ**
इ	*i*	**i**	ॡ	*ḹ*	**ḹ**
ई	*ī*	**ī**	ए	*e*	**e**
उ	*u*	**u**	ऐ	*ai*	**ai**
ऊ	*ū*	**ū**	ओ	*o*	**o**
ऋ	*ṛ*	**ṛ**	औ	*au*	**au**

Consonants

Letter	*Name*	*Transliteration*	*Letter*	*Name*	*Transliteration*
क	*ka*	**ka**	फ	*pha*	**pha**
ख	*kha*	**kha**	ब	*ba*	**ba**
ग	*ga*	**ga**	भ	*bha*	**bha**
घ	*gha*	**gha**	म	*ma*	**ma**
ङ	*ṇa*	**ṇa**	य	*ya*	**ya**
च	*ca*	**ca**	र	*ra*	**ra**
छ	*cha*	**cha**	ल	*la*	**la**
ज	*ja*	**ja**	व	*va*	**va**
झ	*jha*	**jha**	श	*śa*	**śa**
ञ	*ña*	**ña**	ष	*ṣa*	**ṣa**
ट	*ṭa*	**ṭa**	स	*sa*	**sa**
ठ	*ṭha*	**ṭha**	ह	*ha*	**ha**
ड	*ḍa*	**ḍa**	क़	*qa*	**qa**
ढ	*ḍha*	**ḍha**	ख़	*k̲h̲a*	**k̲h̲a**
ण	*ṇa*	**ṇa**	ग़	*ġa*	**ġa**
त	*ta*	**ta**	ज़	*za*	**za**
थ	*tha*	**tha**	ड़	*ṛa*	**ṛa**
द	*da*	**da**	ढ़	*ṛha*	**ṛha**
ध	*dha*	**dha**	फ़	*fa*	**fa**
न	*na*	**na**	ळ	*ḷa*	**ḷa**
प	*pa*	**pa**			

Conjunct Consonants

क्क	kka	च्छ	ccha	त्त्व	ttva	प्त	pta	श्च्य	ścya
क्ख	kkha	च्छ्र	cchra	त्थ	ttha	प्त्य	ptya	श्न	śna
क्च	kca	च्ञ	cña	त्न	tna	प्न	pna	श्य	śya
क्ण	kṇa	च्म	cma	त्न्य	tnya	प्प	ppa	श्र	śra
क्त	kta	च्य	cya	त्प	tpa	प्म	pma	श्र्य	śrya
क्त्य	ktya	छ्य	chya	त्प्र	tpra	प्य	pya	श्ल	śla
क्त्र	ktra	छ्र	chra	त्म	tma	प्र	pra	श्व	śva
क्त्र्य	ktrya	ज्ज	jja	त्म्य	tmya	प्ल	pla	श्व्य	śvya
क्त्व	ktva	ज्झ	jjha	त्व	tva	प्व	pva	श्श	śśa
क्न	kna	ज्ञ	jña	त्स	tsa	प्स	psa	ष्ट	ṣṭa
क्न्य	knya	ज्ञ्य	jñya	त्स्न	tsna	प्स्व	psva	ष्ट्य	ṣṭya
क्म	kma	ज्म	jma	त्स्न्य	tsnya	ब्घ	bgha	ष्ट्र	ṣṭra
क्य	kya	ज्य	jya	थ्य	thya	ब्ज	bja	ष्ट्र्य	ṣṭrya
क्र	kra	ज्र	jra	द्ग	dga	ब्द	bda	ष्ट्व	ṣṭva
क्र्य	krya	ज्व	jva	द्ग्र	dgra	ब्ध	bdha	ष्ठ	ṣṭha
क्ल	kla	ञ्च	ñca	द्घ	dgha	ब्न	bna	ष्ण	ṣṇa
क्व	kva	ञ्च्म	ñcma	द्घ्र	dghra	ब्ब	bbba	ष्ण्य	ṇya
क्व्य	kvya	ञ्च्य	ñcya	द्द	dda	ब्भ	bha	ष्प	ṣpa
क्ष	kṣa	ञ्छ	ñcha	द्द्य	ddya	ब्भ्य	bbhya	ष्प्र	ṣpra
क्ष्म	kṣma	ञ्ज	ñja	द्ध	ddha	ब्य	bya	ष्म	ṣma
क्ष्य	kṣya	ञ्ज्य	ñjya	द्ध्य	ddhya	ब्र	bra	ष्य	ṣya
क्ष्व	kṣva	ट्ट	ṭṭa	द्न	dna	ब्व	bva	ष्व	ṣva
ख्य	khya	ट्य	ṭya	द्ब	dba	भ्न	bhna	स्क	ska
ख्र	khra	ठ्य	ṭhya	द्भ	dbha	भ्य	bhya	स्ख	skha
ग्य	gya	ठ्र	ṭhra	द्भ्य	dbhya	भ्र	bhra	स्त	sta
ग्र	gra	ड्ग	ḍga	द्म	dma	भ्व	bhva	स्त्य	stya
ग्र्य	grya	ड्ग्य	ḍgya	द्य	dya	म्न	mna	स्त्र	stra
घ्न	ghna	ड्घ	ḍgha	द्र	dra	म्प	mpa	स्त्व	stva
घ्न्य	ghnya	ड्घ्र	ḍghra	द्र्य	drya	म्प्र	mpra	स्थ	stha
घ्म	ghma	ड्ढ	ḍḍha	द्व	dva	म्ब	mba	स्न	sna
घ्य	ghya	ड्म	ḍma	द्व्य	dvya	म्भ	mbha	स्न्य	snya
घ्र	ghra	ड्य	ḍya	ध्न	dhna	म्म	mma	स्प	spa
ङ्क	ṅka	ढ्य	ḍhya	ध्न्य	dhnya	म्य	mya	स्फ	spha
ङ्क्त	ṅkta	ढ्र	ḍhra	ध्म	dhma	म्र	mra	स्म	sma
ङ्क्त्य	ṅktya	ण्ट	ṇṭa	ध्य	dhya	म्ल	mla	स्म्य	smya
ङ्क्य	ṅkya	ण्ठ	ṇṭha	ध्र	dhra	म्व	mva	स्य	sya
ङ्क्ष	ṅkṣa	ण्ड	ṇḍa	ध्र्य	dhrya	य्य	yya	स्र	sra
ङ्क्ष्व	ṅkṣva	ण्ड्य	ṇḍya	ध्व	dhva	य्व	yva	स्व	sva
ङ्ख	ṅkha	ण्ड्र	ṇḍra	न्त	nta	ल्क	lka	स्स	ssa
ङ्ख्य	ṅkhya	ण्ड्र्य	ṇḍrya	न्त्य	ntya	ल्प	lpa	ह्ण	hṇa
ङ्ग	ṅga	ण्ढ	ṇḍha	न्त्र	ntra	ल्म	lma	ह्न	hna
ङ्ग्य	ṅgya	ण्ण	ṇṇa	न्द	nda	ल्य	lya	ह्म	hma
ङ्घ	ṅgha	ण्म	ṇma	न्द्र	ndra	ल्ल	lla	ह्य	hya
ङ्घ्य	ṅghya	ण्य	ṇya	न्न	nna	ल्व	lva	ह्र	hra
ङ्घ्र	ṅghra	ण्व	ṇva	न्प	npa	ल्ह	lha	ह्ल	hla
ङ्ङ	ṅṅa	त्क	tka	न्प्र	npra	व्न	vna	ह्व	hva
ङ्न	ṅna	त्क्र	tkra	न्म	nma	व्य	vya		
ङ्म	ṅma	त्त	tta	न्य	nya	व्र	vra		
ङ्य	ṅya	त्त्य	ttya	न्र	nra	व्व	vva		
च्च	cca	त्त्र	ttra	न्स	nsa	श्च	śca		

Hebrew and Yiddish

Letter	*Final*	*Name*	*Transliteration*	*Letter*	*Final*	*Name*	*Transliteration*
א		*alef*	’	כּ		*kaf*	**k, kk**
ב		*bet*	**v**	ל		*lamed*	**l, ll**
בּ		*bet*	**b, bb**	מ	ם	*mem*	**m, mm**
ג		*gimel*	**g, gg**	נ	ן	*nun*	**n, nn**
גּ		*gimel*	**g, gg**	ס		*samekh*	**m, mm**
ד		*dalet*	**d, dd**	ע		*ayin*	’
דּ		*dalet*	**d, dd**	פּ	ףּ	*pe*	**p**
ה		*hei*	**h**	פ	ף	*fe*	**f**
הּ		*hei*	**h**	צ	ץ	*tsadi*	**ts**
ו		*vav*	**v, vv**	ק		*qof*	**q**
ז		*zayin*	**z, zz**	ר		*resh*	**r**
ח		*h̄et*	**h̄**	שׂ		*sin*	**s**
ט		*tet*	**t, tt**	שׁ		*shin*	**sh**
י		*yod*	**y, yy**	ת		*tav*	**p**
כ	ך	*khaf*	**kh**	תּ		*tav*	**p**

Modern Greek

Letter		*Name*	*Transliteration*	*Letter*		*Name*	*Transliteration*
Α	α	alfa	**a**	Ν	ν	ni	**n**
Β	β	vita	**v**	Ξ	ξ	xi	**x**
Γ	γ	gama	**g/y**	Ο	ο	omicron	**o**
Δ	δ	ðelta	**ð**	Π	π	pi	**p**
Ε	ε	epsilon	**e**	Ρ	ρ	ro	**r**
Ζ	ζ	zita	**z**	Σ	σ,ς	sigma	**s**
Η	η	ita	**i**	Τ	τ	taf	**t**
Θ	ϑ	ϑita	**th**	Υ	υ	ipsilon	**i**
Ι	ι	yiota	**i**	Φ	φ	phi	**f**
Κ	ϰ	kapa	**k**	Χ	χ	hi	**h**
Λ	λ	lambða	**l**	Ψ	ψ	psi	**ps**
Μ	μ	mi	**m**	Ω	ω	omega	**o**

Double Consonants

Written	Transliterated	Written	Transliterated
μπ (initial)	**b**	γϰ (medial)	**ng**
μπ (medial)	**mb**	γγ	**ng**
ντ (initial)	**d**	τσ	**ts**
ντ (medial)	**nd**	τζ	**tz**
γϰ (initial)	**g**		

Diphthongs

Written	Transliterated	Written	Transliterated
αι	**ai**	ευ	**ev**
αυ	**av**	ευ	**ef**
αυ	**af**	οι	**oi**
ει	**ei**	ου	**ou**

Notes. — 1. αι is pronounced /ε/, and ει and οι are both pronounced /i/; however, in the transliterations it is the original spelling rather than the pronunciation that is respected. 2. The diphthong αυ is transliterated (and pronounced) /af/ before ϑ, ϰ, ξ, π, σ, τ, φ, χ and ψ; in all other cases it is transliterated (and pronounced) as /av/. 3. The preceding rule also applies to the transliteration of ευ (with respective pronunciations /εf/ and /εv/).

Ottoman Turkish

Letter				*Name*	*Modern*
Isolated	*Initial*	*Medial*	*Final*		*Turkish*
ا			ـا	*elif*	**a, e**
ء				*hemze*	
ب	بـ	ـبـ	ـب	*be*	**b**
پ	پـ	ـپـ	ـپ	*pe*	**p**
ت	تـ	ـتـ	ـت	*te*	**t**
ث	ثـ	ـثـ	ـث	*se*	**s**
ج	جـ	ـجـ	ـج	*cim*	**c**
چ	چـ	ـچـ	ـچ	*çim*	**ç**
ح	حـ	ـحـ	ـح	*ha*	**h**
خ	خـ	ـخـ	ـخ	*hı*	**h**
د			ـد	*dal*	**d**
ذ			ـذ	*zel*	**z**
ر			ـر	*re*	**r**
ز			ـز	*ze*	**z**
ژ	ژ	ژ	ژ	*je*	**j**
س	سـ	ـسـ	ـس	*sin*	**s**
ش	شـ	ـشـ	ـش	*şın*	**ş**
ص	صـ	ـصـ	ـص	*sad*	**s**
ض	ضـ	ـضـ	ـض	*dad*	**d, z**
ط	طـ	ـطـ	ـط	*tı*	**t**
ظ	ظـ	ـظـ	ـظ	*zı*	**z**
ع	عـ	ـعـ	ـع	*ayn*	**’, h (or omitted)**
غ	غـ	ـغـ	ـغ	*gayn*	**g, ğ**
ف	فـ	ـفـ	ـف	*fe*	**f**
ق	قـ	ـقـ	ـق	*kaf*	**k**
ك	كـ	ـكـ	ـك	*kef*	**k, g, g, n**
گ	گـ	ـگـ	ـگ	*gef*	**g, ğ**
ڭ			ـڭ	*nef, sağir kef*	**n**
ل	لـ	ـلـ	ـل	*lam*	**l**
م	مـ	ـمـ	ـم	*mim*	**m**
ن	نـ	ـنـ	ـن	*nun*	**n**
و			ـو	*(vav)*	**v, o, ö, u, ü**
ه	هـ	ـهـ	ـه	*he*	**h, e, a**
ى	يـ	ـيـ	ـى	*ye*	**y, ı, i**

Persian

Letter				*Name*	*Transliteration*
Isolated	*Initial*	*Medial*	*Final*		
ا		ـا	ـا	(*alef*)	**a**
ب	بـ	ـبـ	ـب	(*be*)	**b**
پ	پـ	ـپـ	ـپ	(*pe*)	**p**
ت	تـ	ـتـ	ـت	(*te*)	**t**
ث	ثـ	ـثـ	ـث	(*se*)	**s**
ج	جـ	ـجـ	ـج	(*jīm*)	**j**
چ	چـ	ـچـ	ـچ	(*ce*)	**c**
ح	حـ	ـحـ	ـح	(*he-jimi*)	**h**
خ	خـ	ـخـ	ـخ	(*xe*)	**x**
د			ـد	(*dāl*)	**d**
ذ			ـذ	(*zāl*)	**z**
ر			ـر	(*re*)	**r**
ز			ـز	(*ze*)	**z**
ژ			ـژ	(*ĝe*)	**ĝ**
س	سـ	ـسـ	ـس	(*sin*)	**s**
ش	شـ	ـشـ	ـش	(*šin*)	**š**
ص	صـ	ـصـ	ـص	(*sād*)	**s**
ض	ضـ	ـضـ	ـض	(*zād*)	**z**
ط	طـ	ـطـ	ـط	(*tā*)	**t**
ظ	ظـ	ـظـ	ـظ	(*zā*)	**z**
ع	عـ	ـعـ	ـع	(*ein*)	**‘**
غ	غـ	ـغـ	ـغ	(*qein*)	**q**
ف	فـ	ـفـ	ـف	(*fe*)	**f**
ق	قـ	ـقـ	ـق	(*qāf*)	**q**
ک	کـ	ـکـ	ـک	(*kāf*)	**k**
گ	گـ	ـگـ	ـگ	(*gāf*)	**g**
ل	لـ	ـلـ	ـل	(*lām*)	**l**
م	مـ	ـمـ	ـم	(*mim*)	**m**
ن	نـ	ـنـ	ـن	(*nun*)	**n**
و			ـو	(*vāv*)	**v**
ه	هـ	ـهـ	ـه	(*he-do-cešm*)	**h**
ی	یـ	ـیـ	ـی	(*ye*)	**y**

Notes. — 1. Gemination (doubling) of a consonant is effected by use of the *tašdid*, a w-shaped script placed above the consonant to be doubled.
2. The final *he-do-cešm* (ه) is also used to denote a final *a* (rare) or *e*.

Russian

Letter		*Name*	*Transliteration*
А (*А*)	а (*а*)	а (a)	**a**
Б (*Б*)	б (*б*)	бэ (be)	**b**
В (*В*)	в (*в*)	вэ (ve)	**v**
Г (*Г*)	г (*г*)	гэ (ge)	**g**
Д (*Д*)	д (*д*)	дэ (de)	**d**
Е (*Е*)	е (*е*)	е (йэ) (ye)	**(y)e**
Ё (*Ё*)	ё (*ё*)	ё (йо) (yo)	**yo**
Ж (*Ж*)	ж (*ж*)	жэ (zhe)	**zh**
З (*З*)	з (*з*)	зэ (ze)	**z**
И (*И*)	и (*и*)	и (i)	**i**
Й (*Й*)	й (*й*)	й (и краткое) (short i)	**y**
К (*К*)	к (*к*)	ка (ka)	**k**
Л (*Л*)	л (*л*)	эл (el)	**l**
М (*М*)	м (*м*)	эм (em)	**m**
Н (*Н*)	н (*н*)	эн (en)	**n**
О (*О*)	о (*о*)	о (o)	**o**
П (*П*)	п (*п*)	пэ (pe)	**p**
Р (*Р*)	р (*р*)	эр (er)	**r**
С (*С*)	с (*с*)	эс (es)	**s**
Т (*Т*)	т (*т*)	тэ (te)	**t**
У (*У*)	у (*у*)	у (u)	**u**
Ф (*Ф*)	ф (*ф*)	эф (ef)	**f**
Х (*Х*)	х (*х*)	ха (kha)	**kh**
Ц (*Ц*)	ц (*ц*)	цэ (tse)	**ts**
Ч (*Ч*)	ч (*ч*)	чэ (che)	**ch**
Ш (*Ш*)	ш (*ш*)	ша (sha)	**sh**
Щ (*Щ*)	щ (*щ*)	ща (shcha)	**shch**
Ъ (*Ъ*)	ъ (*ъ*)	твёрдый знак (hard sign)	—
Ы (*Ы*)	ы (*ы*)	ы (y)	**y**
Ь (*Ь*)	ь (*ь*)	мягкий знак (soft sign)	**'**
Э (*Э*)	э (*э*)	э (e)	**e**
Ю (*Ю*)	ю (*ю*)	ю (йу) (yu)	**yu**
Я (*Я*)	я (*я*)	я (йа) (ya)	**ya**

Ukrainian

Letter		*Name*	*Transliteration*
А	а	а (a)	**a**
Б	б	бе (be)	**b**
В	в	ве (ve)	**v**
Г	г	ге (he)	**h**
Д	д	де (de)	**d**
Е	е	е (e)	**e**
Є	є	є (ye)	**ye**
Ж	ж	же (zhe)	**zh**
З	з	зе (ze)	**z**
И	и	и (i)	**i**
І	і	і (i)	**ī**
Ї	ї	ї (yi)	**yī**
Й	й	йот (yot)	**y**
К	к	ка (ka)	**k**
Л	л	ел (el)	**l**
М	м	ем (em)	**m**
Н	н	ен (en)	**n**
О	о	о (o)	**o**
П	п	пе (pe)	**p**
Р	р	ер (er)	**r**
С	с	ес (es)	**s**
Т	т	те (te)	**t**
У	у	у (u)	**u**
Ф	ф	еф (ef)	**f**
Х	х	ха (kha)	**kh**
Ц	ц	це (tse)	**ts**
Ч	ч	ча (cha)	**ch**
Ш	ш	ша (sha)	**sh**
Щ	щ	ща (shcha)	**shch**
Ь	ь	м'який знак (soft sign)	**'**
Ю	ю	ю (yu)	**yu**
Я	я	я (ya)	**ya**

Appendix 3

Mercury Data

Observational Parameters [1]

Minimum distance from Earth	77.3×10^6 km
Maximum distance from Earth	221.9×10^6 km
Apparent maximum diameter from Earth	13 arcsec
Apparent minimum diameter from Earth	4.5 arcsec
Maximum visual magnitude	−1.9
Mean distance from Earth at inferior conjunction	91.0×10^6 km
Mean apparent diameter a inferior conjunction	11.0 arcsec

Bulk Parameters [1]

Equatorial radius	2439.7 km
	$0.383 r_\oplus$
Polar radius	2439.7 km
	$0.384 r_\oplus$
Volumetric mean radius	2439.7 km
	$0.383 \langle r_\oplus \rangle$
Oblateness	0
Volume	6.083×10^{10} km^3
	$0.0562 r_\oplus$
Mass	3.302×10^{23} kg
	$0.0553 M_\oplus$
Mean density	5427 kg m^{-3}
	$0.984 \rho_\oplus$
Surface gravity (equator)	3.70 m s^{-2}
	$0.378 g_\oplus$
Surface acceleration (equator)	3.70 m s^{-2}
	$0.378 g_\oplus$
Escape velocity	4.3 km s^{-1}
	$0.384 v_{\mathrm{esc},\oplus}$
GM	0.02203×10^6 km^3 s^{-2}
	$0.0553 (GM)_\oplus$
Albedo	0.068 (Bond)
	0.142 (visual geometric)
Visual magnitude $V(1,0)$	−0.42
Solar irradiance	9,126.6 W m^{-2}
	$6.673 f_\oplus$
Blackbody temperature	440.1 K
Moment of inertia $(I/(MR^2))$	0.33
	$0.998 (I/(MR^))_\oplus$
$J_2 \times 10^{-6}$	60

Note.—The suffix '⊕' denotes 'Earth'.

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

Orbital Parameters [1]

Semi-major axis	57 909 100 km
	0.387098 AU
Sidereal orbital period	87.9691 day
	(0.240846 year)
Tropical orbital period	87.968 day
	0.241 year
Perihelion	46 001,200 km
	0.307499 AU
Aphelion	69 816 900 km
	0.466697 AU
Synodic period	115.88 day
Mean orbital velocity	47.87 km s^{-1}
	$1.607\langle v_{\mathrm{orb},\oplus}\rangle$
Maximum orbital velocity	58.98 km s^{-1}
	$1.947 v_{\mathrm{orb\,max},\oplus}$
Minimum orbital velocity	38.86 km s^{-1}
	$1.327 v_{\mathrm{orb\,min},\oplus}$
Inclination of orbital plane	7.00°
Orbital eccentricity	0.2056
	$12.311 e_{\oplus}$
Sidereal rotation period	1407.6 h (58.785 day)
Length of day	4222.6 h (175.942 day)
	(0.5 Mercurian solar day)
Obliquity to orbit	∼0°
Spin–orbit resonance	3:2
Satellites	none
Ring systems	none

Note.—The suffix '⊕' denotes 'Earth'.

Mean orbital elements (J2000) [1]

Semimajor axis	0.38709893 AU
Orbital eccentricity	0.20563069
Orbital inclination	7.00487°
Longitude of ascending node	48.33167°
Longitude of perihelion	77.45645°
Mean longitude	252.25084°

Magnetosphere [1]

Field strength at equator	∼300 nT
Dipole tilt of rotational axis	169°
Longitude of tilt[a]	285°
Longitude of tilt[b]	115°

[a]From *MESSENGER* flyby I.

[b]From *MESSENGER* flyby III.

Appendix 4

Mercury Transits

The table of transits of Mercury and the formula for calculating local visibility of transits are taken from the public-domain document 'Transits of Mercury', authored by Fred Espinak [1], and are available on NASA/Goddard Space Flight Center's website.[1]

Occurrence of Transits

The calculation of transits of Mercury is explained by McNally [2] and Meeus [3]. At the present time, the nodes of Mercury's orbit fall between the Sun and the Earth in May (descending node) and November (ascending node). If Mercury happens to be close to a node when this happens a transit can occur. About two-thirds of transits take place when Mercury is at its ascending node (in November). Espinak [4] has catalogued 94 transits of Mercury between A.D. 1605 and A.D. 2295. Espinak's catalogue is reproduced here with permission.

Transit Series

Consecutive transits occur at intervals of 3.5, 7, 9.5, 10 or 13 years. A fairly precise pattern of repetition of transits occurs every 46 years (representing 191 orbits of Mercury with an excess of a mere 0.34 days). May transit series last for 414 years, whereas November transit series endure approximately twice as long; hence, there are roughly twice as many November as May transits.

Visibility of Transits

In order to determine whether a transit will be visible from a certain location it is necessary to calculate the local hour angle, altitude and azimuth of the Sun at the time of transit. These quantities are found from the following formulae:

$$h_\odot = 15(\mathrm{GST} + t - \alpha_\odot) + \lambda \tag{1}$$

$$a_\odot = \sin^{-1}(\sin\delta_\odot \sin\phi + \cos\delta_\odot \cos h_\odot \cos\phi) \tag{2}$$

$$A_\odot = \tan^{-1}\{-(\cos\delta_\odot \sin h_\odot)/(\sin\delta_\odot \cos\phi - \cos\delta_\odot \cos h_\odot \sin\phi)\} \tag{3}$$

where

$h_\odot$ = hour angle of the Sun (in degrees)
$a_\odot$ = altitude of the Sun (in degrees)
$A_\odot$ = azimuth of the Sun (in degrees)
GST = Greenwich Sidereal Time at 00:00 UT
t = Universal Time (UT)
$\alpha_\odot$ = right ascension of the Sun (in hours)
$\delta_\odot$ = declination of the Sun (in degrees)
λ = observer's longitude (east +ve, west −ve)
ϕ = observer's latitude (north +ve, south −ve)

[1] http://eclipse.gsfc.nasa.gov/transit/catalog/MercuryCatalog.html

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

Date	Transit contact times (UT) t_{I} h:m	t_{II} h:m	$t_{\max}$ h:m	t_{III} h:m	t_{IV} h:m	$r_{\min.}$ ″	$\alpha_{\odot}$ h	$\delta_{\odot}$ deg	GST h	Series
1605 Nov 01	18:43	18:47	20:02	21:18	21:21	855.9	14.471	−14.68	2.739	6
1615 May 03	06:41	06:44	10:09	13:33:	13:36	468.4	2.666	15.61	14.725	5
1618 Nov 04	11:08	11:10	13:42	16:14	16:15	352.8	14.642	−15.49	2.909	4
1628 May 05	14:19	14:23	17:32	20:40	20:44	571.0	2.869	16.52	14.933	3
1631 Nov 07	04:38	04:39	07:20	10:01	10:03	146.4	14.814	−16.27	3.079	2
1644 Nov 09	22:53	22:55	00:57	02:58	03:00	641.1	14.987	−17.02	3.249	1
1651 Nov 03	23:07	23:09	00:52	02:35	02:38	750.7	14.540	−15.01	2.809	6
1661 May 03	13:05	13:08	16:54	20:40	20:43	263.2	2.740	15.94	14.800	5
1664 Nov 04	15:53	15:54	18:32	21:10	21:11	250.4	14.711	−15.81	2.979	4
1674 May 07	21:56	22:01	00:16	02:31	02:37	775.4	2.943	16.84	15.008	3
1677 Nov 07	09:32	09:33	12:11	14:48	14:50	248.7	14.884	−16.58	3.149	2
1690 Nov 10	03:57	03:59	05:43	07:27	07:29	742.1	15.057	−17.32	3.318	1
1697 Nov 03	03:58	03:40	05:42	07:43	07:45	647.1	14.610	−15.33	2.878	6
1707 May 05	19:34	19:37	23:32	03:27	03:30	64.5	2.813	16.27	14.875	5
1710 Nov 06	20:39	20:40	23:22	02:03	02:05	145.2	14.781	−16.12	3.048	4
1723 Nov 09	14:25	14:27	16:59	19:30	19:32	350.6	14.953	−16.87	3.218	2
1736 Nov 11	09:07	09:11	10:30	11:49	11:52	843.0	15.128	−17.59	3.388	1
1740 May 02	21:34	21:42	23:02	00:21	00:29	888.8	2.685	15.68	14.742	7
1743 Nov 05	08:12	08:15	10:30	12:45	12:47	542.4	14.679	−15.65	2.948	6
1753 May 06	02:16	02:19	06:13	10:06	10:09	138.6	2.888	16.59	14.949	5
1756 Nov 07	01:26	01:28	04:10	06:54	06:55	42.6	14.851	−16.42	3.118	4
1769 Nov 09	19:21	19:23	21:46	00:10	00:12	454.0	15.024	−17.17	3.288	2
1776 Nov 02	20:55	21.03	21:36	22:09	22:17	943.8	14.522	−14.91	2.793	8
1782 Nov 12	14.35	14:42	15.16	15:50	15:57	944.6	15.199	−17.88	3.457	1
1786 May 04	02:56	03:01	05:41	08:21	08:26	689.0	2.759	16.02	14.817	7
1789 Nov 05	12:51	12:53	15:19	17:44	17:46	439.9	14.748	−15.96	3.018	6
1799 May 07	09:07	09:10	12:50	16.31	16:34	339.5	2.961	16.90	15.024	5
1802 Nov 09	06:14	06:16	08:58	11:41	11:43	60.9	14.921	−16.73	3.188	4
1815 Nov 12	00:18	00:20	02:33	04:46	04:48	556.1	15.094	−17.45	3.357	2
1822 Nov 05	01:00	01:04	02:25	03:45	03:49	838.8	14.646	−15.50	2.917	8
1832 May 05	09:00	09:04	12:25	15.47	15:50	484.7	2.833	16.34	14.892	7
1835 Nov 07	17.33	17:35	20:08	22:41	22:43	336.4	14.817	−16.27	3.087	6
1845 May 08	16:20	16:24	19:37	22:49	22:53	547.2	3.037	17.21	15.099	5
1848 Nov 09	11:05	11:07	13:48	16:28	16:30	163.0	14.991	−17.02	3.257	4
1861 Nov 12	05:18	05:21	07:19	09:18	09:21	657.9	15.166	−17.74	3.427	2
1868 Nov 05	05:26	05:28	07:14	09:00	09:03	735.1	14.715	−15.81	2.987	8
1878 May 06	15:13	15:16	19:00	22:44	22:47	287.3	2.907	16.66	14.966	7
1881 Nov 08	22:17	22:19	00:57	03:36	03:38	231.8	14.888	−16.58	3.157	6
1891 May 10	23.57	23:57	02:22	04:47	04:47	753.6	3.112	17.52	15.174	5
1894 Nov 10	15:56	15:58	18:35	21:11	21:13	266.2	15.061	−17.31	3.327	4

Date	Transit contact times (UT)					$r_{\min}$.	$\alpha_\odot$	$\delta_\odot$	GST	Series
	$t_{\rm I}$ h:m	$t_{\rm II}$ h:m	$t_{\max}$ h:m	$t_{\rm III}$ h:m	$t_{\rm IV}$ h:m	$''$	h	deg	h	
1907 Nov 14	10:24	10:26	12:07	13:47	13:50	758.6	15.236	−18.01	3.496	2
1914 Nov 07	09:57	09:59	12:03	14.07	14.09	630.7	14.785	−16.12	3.056	8
1924 May 08	21:44	21:47	01:41	05:35	05:38	84.6	2.981	16.97	15.041	7
1927 Nov 10	03:02	03:04	05:46	08:27	08:29	128.7	14.958	−16.87	3.226	6
1937 May 11	08:53	–	08:59	–	09:06	955.5	3.187	17.81	15.248	5
1940 Nov 11	20:49	20:51	23:21	01:52	01:53	368.5	15.132	−17.59	3.396	4
1953 Nov 14	15:37	15:41	16:54	18:07	18:11	861.8	15.308	−18.28	3.566	2
1957 May 06	23:59	00:09	01:14	02:20	02:30	907.3	2.852	16.41	14.909	9
1960 Nov 07	14.34	14.36	16:53	19:10	19:12	527.9	14.855	−16.42	3.126	8
1970 May 09	04:19	04:22	08:16	12:10	12:13	114.1	3.056	17.28	15.115	7
1973 Nov 10	07:47	07:49	10:32	13:16	13:17	26.4	15.028	−17.17	3.296	6
1986 Nov 13	01:43	01:45	04:07	06:29	06:31	470.5	15.203	−17.87	3.466	4
1993 Nov 06	03:06	03:12	03:57	04:41	04:47	926.7	14.753	−15.97	3.025	10
1999 Nov 15	21:15	21:30	21:41	21:52	22:07	963.0	15.379	−18.54	3.635	2
2003 May 07	05:13	05:17	07:52	10:27	10:32	708.3	2.926	16.73	14.983	9
2006 Nov 08	19:12	19:14	21:41	00:08	00:10	422.9	14.925	−16.73	3.196	8
2016 May 09	11:12	11:15	14:57	18:39	18:42	318.5	3.130	17.58	15.190	7
2019 Nov 11	12:35	12:37	15:20	18:02	18:04	75.9	15.098	−17.45	3.366	6
2032 Nov 13	06:41	06:43	08:54	11:05	11:07	572.1	15.274	−18.14	3.535	4
2039 Nov 07	07:17	07:21	08:46	10:12	10:15	822.3	14.822	−16.27	3.095	10
2049 May 07	11:03	11:07	14.24	17:41	17:44	511.8	3.000	17.04	15.058	9
2052 Nov 09	23:53	23:55	02:29	05:04	05:06	318.7	14.996	−17.02	3.265	8
2062 May 10	18:16	18:20	21:36	00:53	00:57	520.5	3.206	17.88	15.265	7
2065 Nov 11	17:24	17:26	20:06	22:46	22:48	180.7	15.170	−17.73	3.435	6
2078 Nov 14	11:42	11:44	13:41	15:37	15:39	674.3	15.345	−18.41	3.605	4
2085 Nov 07	11:42	11:45	13:34	15:24	15:26	718.5	14.893	−16.58	3.165	10
2095 May 08	17:20	17:24	21:05	00:47	00:50	309.8	3.075	17.35	15.133	9
2098 Nov 10	04:35	04.37	07:16	09:56	09:57	214.7	15.066	−17.31	3.335	8
2108 May 12	01:40	01:44	04:16	06:47	06:52	724.7	3.281	18.16	15.340	7
2111 Nov 14	22:15	22:17	00:53	03:29	03:30	283.3	15.241	−18.01	3.505	6
2124 Nov 15	16:49	16:52	18:28	20:04	20:07	778.9	15.418	−18.67	3.674	4
2131 Nov 09	16:14	16:16	18:22	20:29	20:31	614.4	14.962	−16.87	3.234	10
2141 May 10	23:46	23:50	03:43	07:36	07:39	108.1	3.151	17.65	15.207	9
2144 Nov 11	09:18	09:19	12:02	14:44	14:46	112.7	15.137	−17.59	3.404	8
2154 May 13	10:03	10:18	10:58	11:38	11:53	930.6	3.357	18.45	15.414	7
2157 Nov 14	03.08	03:10	05:40	08:09	08:11	386.9	15.313	−18.28	3.574	6
2170 Nov 16	22.05	22:09	23.15	00:22	00:26	880.4	15.489	−18.92	3.744	4
2174 May 08	02:24	02:37	03:26	04:15	04:27	924.4	3.021	17.12	15.076	11
2177 Nov 09	20:48	20:50	23:09	01:28	01:30	509.8	15.033	−17.17	3.304	10
2187 May 11	06.27	06:30	10:24	14:18	14:21	96.0	3.226	17.94	15.282	9
2190 Nov 12	14:03	14:05	16:48	19:32	19:33	9.1	15.207	−17.87	3.474	8

Date	Transit contact times (UT)									
	t_{I} h:m	t_{II} h:m	t_{max} h:m	t_{III} h:m	t_{IV} h:m	r_{min}. ″	$\alpha_{\odot}$ h	$\delta_{\odot}$ deg	GST h	Series
2203 Nov 16	08:04	08:06	10:27	12:47	12:49	488.6	15.384	−18.54	3.644	6
2210 Nov 09	09:14	09:19	10:13	11:06	11:11	911.0	14.930	−16.73	3.203	12
2220 May 09	07:23	07:27	09:56	12:25	12:30	728.5	3.095	17.41	15.150	11
2223 Nov 12	01:25	01:27	03:55	06:24	06:26	406.5	15.103	−17.45	3.373	10
2233 May 12	13:13	13:16	16:59	20:43	20:46	296.2	3.301	18.23	15.357	9
2236 Nov 13	18:50	18:52	21:35	00:17	00:19	95.4	15.279	−18.14	3.543	8
2249 Nov 16	13:02	13:04	15:12	17:21	17:23	591.6	15.456	−18.80	3.713	6
2256 Nov 09	13:26	13:29	14:59	16:29	16:32	807.4	15.000	−17.02	3.273	12
2266 May 10	13:16	13:20	16:34	19:47	19:51	529.7	3.170	17.71	15.225	11
2269 Nov 12	06:04	06:06	08:42	11:17	11:19	302.5	15.175	−17.73	3.443	10
2279 May 13	20:14	20:18	23:38	02:57	03:01	499.5	3.376	18.50	15.431	9
2282 Nov 15	23:41	23:41	02:22	05:02	05:02	197.9	15.350	−18.41	3.613	8
2295 Nov 17	18:03	18:06	19:59	21:52	21:54	694.6	15.528	−19.04	3.783	6

Key to Table of Mercury Transits

Column	Heading	Explanation
1	Date	Gregorian calendar date
2	t_{I}	UT of Contact I: disc of Mercury externally tangent to the limb of the Sun (beginning of ‘ingress’)
3	t_{II}	UT of Contact II: disc of Mercury internally tangent to the limb of the Sun (end of ‘ingress’)
4	t_{max}	UT of Greatest Transit: instant of closest approach by Mercury to the centre of the solar disc (as seen geocentrically)
5	t_{III}	UT of Contact III: Mercury again internally tangent to the limb of the Sun (beginning of ‘egress’)
6	t_{IV}	UT of Contact IV: Mercury’s disc externally tangent to the limb of the Sun (end of ‘egress’)
7	r_{min}	Minimum angular separation (in seconds of arc) between the centres of the discs of Mercury and the Sun (at the moment of greatest transit)
8	$\alpha_{\odot}$	Geocentric right ascension (in hours) of the Sun at greatest transit
9	$\delta_{\odot}$	Geocentric declination (in degrees) of the Sun at greatest transit
10	GST	Greenwich Sidereal Time at 00:00 UT
11	Series	The number of the transit series (see p. 287)

APPENDIX 5

MERCURY TIMELINE

Date	Event
	Pre-telescopic Era
∼1150 B.C.	Assyrian *mul.apin* tablet mentions observations of Mercury [1,2]
∼1150 B.C.	Egyptians recognize that morning and evening apparitions of Mercury are the same body [3]
n.d.	Chaldeans recognize that morning and evening apparitions of Mercury are the same body [4]
n.d.	Pythagoreans claim that Mercury moves round the Sun [5]
∼550 B.C.	Pythagoras or Parmenides recognizes that morning and evening apparitions of Mercury are the same body [6]
∼ 380 B.C.	Plato the first to note the yellowish colour of Mercury [7]
265 Nov 15 B.C.	First recorded observation of Mercury (by Dionysios or Timocharis): morning, $\lambda_{\text{Mer}} = 213°; 20$, $\lambda_{\odot} = 230°; 50$ [8]
262 Feb 12 B.C.	Morning observation of Mercury by Dionysios or Timocharis: $\lambda_{\text{Mer}} = 292°; 20$, $\lambda_{\odot} = 318°; 10$, max. elong. $= 25°; 50$ [9].
262 Apr 25 B.C.	Evening observation of Mercury by Dionysios or Timocharis: $\lambda_{\text{Mer}} = 53°; 40$, $\lambda_{\odot} = 29°; 30$, max. elong. $= 24°; 10$ [10].
262 Aug 23	Evening observation of Mercury by Dionysios or Timocharis: $\lambda_{\text{Mer}} = 169°; 30$, $\lambda_{\odot} = 147°; 50$, max. elong. $= 21°; 40$ [11].
257 May 28 B.C.	Evening observation of Mercury by Dionysios or Timocharis: $\lambda_{\text{Mer}} = 89°; 20$, $\lambda_{\odot} = 62°; 50$, max. elong. $= 26°; 30$ [12].
245 Nov 19 B.C.	Babylonian morning observation of Mercury: $\lambda_{\text{Mer}} = 212°; 20$, $\lambda_{\odot} = 234°; 50$, max. elong. $= 22°; 30$ [13].
237 Oct 30 B.C.	Babylonian morning observation of Mercury: $\lambda_{\text{Mer}} = 194°; 10$, $\lambda_{\odot} = 215°; 10$, max. elong. $= 21°$ [14].
146 B.C.	Cicero describes Mercury and Venus as 'accompanying' the Sun [15]
A.D. 31–27	Marcus Vitruvius Pollio claims that Mercury moves 'round the Sun as a centre' [16]
A.D. 130 Jul 4	Evening observation of Mercury by Theon of Smyrna: $\lambda_{\text{Mer}} = 126°; 20$, $\lambda_{\odot} = 100°; 5$, max. elong. $= 26°; 15$ [17]

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

Date	Event
	Pre-telescopic Era (continued)
A.D. 132 Feb 2	Evening observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 331°$, $\lambda_{\odot} = 309°;45$, max. elong. $= 21°;15$ [18].
A.D. 134 Jun 4	Morning observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 48°;45$, $\lambda_{\odot} = 70°$, max. elong. $= 21°;15$ [19].
A.D. 134 Oct 3	Morning observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 170°;12$, $\lambda_{\odot} = 189°;15$, max. elong. $= 19°;3$ [20].
A.D. 135 Apr 5	Evening observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 34°;20$, $\lambda_{\odot} = 11°;5$, max. elong. $= 23°;15$ [21].
A.D. 138 Jun 4	Evening observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 97°$, $\lambda_{\odot} = 70°;30$, max. elong. $= 26°;30$ [22].
A.D. 139 May 17	Evening observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 77°;30$, $\lambda_{\odot} = 52°;34$ [23]
A.D. 139 July 5	Morning observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 80°;5$, $\lambda_{\odot} = 100°;20$, max. elong. $= 20°;15$ [24].
∼ A.D. 140	Theon of Smyrna claims that Mercury and Venus ‘turn round the sun’ [25]
A.D. 141 Feb 2	Morning observation of Mercury by Ptolemy: $\lambda_{\rm Mer} = 283°;30$, $\lambda_{\odot} = 310°;0$, max. elong. $= 26°;30$ [26].
∼A.D. 150	Ptolemy completes the *Almagest* (μαθηματικὴ σύνταξις), in which all the planets circle the Earth. Ptolemy’s elements for Mercury’s orbit: $R = 60^{\rm p}$, $r = 22^{\rm p};30$, $e = 3^{\rm p};00$, $3e > \|\mathbf{e}\| > e$, $\lambda_{\rm aph} = 190°$, $\lambda_{\Pi_1} = 70°$, $\lambda_{\Pi_2} = 310°$ (two perigees) [27].
A.D. 362 Dec	Julian the Apostate claims that the planets ‘round about him (the Sun), as though he were their king, lead on their dance, at appointed distances from him.’ [28]
A.D. 410–429	Martianus Capella claims that Mercury and Venus move round the Sun [29]
A.D. 12th c.	Alpatregius explained the apparent absence of transits of Mercury and as being due to the self-luminosity of these planets, rendering such transits invisible [30]
A.D. 1543	Copernicus publishes *De revolutionibus obrium coelestium*, in which he claims that the planets move round the Sun [31]
	Telescopic Era
1629	Kepler makes first successful prediction of a Mercury transit [32]

Date	Event
	Telescopic Era (continued)
1631 Nov 7	Gassendi observes Kepler's predicted transit of Mercury [33]
1639 May 23	Astronomer, mathematician and Jesuit priest Giovanni Battista Zupi(1590–1650) makes the first observations of the phases of Mercury [34]
1644 Nov 22	Johannes Hevelius (1611–1687)confirms the phases of Mercury [35]
1677	Gallet d'Avignon notes Mercury's oval form near the Sun's limb during (the 'black drop') [36]
1707 May 5	Flamsteed's assistant sees 'a mist or dense atmosphere' surrounding the black disc of Mercury during transit across the Sun [37]
1782	Wallot concludes that Mercury has an atmosphere [38]
1764	La Lande explains black drop as due to irradiation [39]
1792	Schröter reports a dense atmosphere on Mercury [40]
1799	Schröter and Harding find dark ring around Mercury during transit and deduce the presence of a thick Mercurian atmosphere [41]
1800–1801	Schröter notes shortened dichotomy of Venus [42]
	Schröter deduces a rotational period for Mercury of 24 h 5 min 30 s [43]
	Schröter reports a mountain on Mercury that is 1/126 of the planet's radius in height [44]
1832	Simms detected a ring around Mercury during transit [45]
	Bessel deduces 24 h 00 min 53 s rotation period and axial inclination of 70° from surface markings [46]
	Bessel attributes 'black drop' to irradiation [47]
1848	Dawes attributes 'black drop' to blurring caused by unsteadiness of Earth's atmosphere [48]
1865 (?)	Kirkwood deduces theoretically that Mercury's rotational period is tidally locked with its orbital period [49]
1867	C. L. Prince reports a bright spot on the surface of Mercury [50]
1870	Birmingham reports white spots [51]
1874	van de Sande Bakhuysen interprets 'black drop' phenomenon in terms of diffraction [52]

Date	Event
	Telescopic Era (continued)
1871	Vogel deduces the presence of a terrestrial-type atmosphere on Mercury from spectroscopic observations [53]
	Huggins deduces the presence of water vapour in Mercury's 'atmosphere' [54]
1877 March 22	The date for which Leverrier predicts the transit of the supposed intra-Mercurial planet Vulcan across the face of the Sun. No such transit is observed [55].
1881–1889	Schiaparelli's Mercury observing campaign; he deduces a rotational period equal to the orbital period (87.969256 day); he maps Mercury [56]
1882	Denning gives first reliable report of surface markings on Mercury and derives a rotation period of 25 h [57]
1889	Schiaparelli thought he had detected a dense atmosphere on Mercury [58]
1893	Müller notes the similarity of the light-curves of Mercury and the Moon indicating a similarity in their surfaces [59]
1896	Lowell charts Mercury and maps an illusory network of canals [60,61]
1900 Aug 31	Barnard reports lunar-like dark patches on surface of Mercury [62]
1912	Danjon and Couder independently confirm the 88-day rotation period of Mercury from telescopic observations [63]
1915	Einstein predicts 43 arcsec/century advance in perihelion of Mercury as a test of the General Theory of Relativity [64].
1929	Lyot finds that polarization curves for Mercury and Moon are similar and deduces the presence of volcanic ash on Mercury [65]
1932	Adams & Dunham find no difference between the spectra of Mercury and the Sun [66]
1933	Slipher detects no difference between the spectra of Mercury and the Sun [67]
1934	Antoniadi's *La Planète Mercure* published in Paris by Gauthier–Villars [68]
1965	58.6 day sidereal rotation period of Mercury measured by radar [69]
	Shapiro uses delay in radar signal to Mercury at superior conjunction as a test of the General Theory of Relativity [70]
	Colombo explains the cause of the 2:3 spin–orbital resonance of Mercury [71]

Date	Event
	Space Exploration Era
1973 Nov 3	*Mariner 10* launched from NASA's Kennedy Space Center [72]
1974 Mar 29	First Mercury flyby of *Mariner 10* (nearest approach 703 km) [73]
1974 Sep 21	Second Mercury flyby of *Mariner 10* (nearest approach: 48 069 km) [74]
1975 Mar 16	Third Mercury flyby of *Mariner 10* (nearest approach: 327 km) [75]
	Mariner 10 reveals craters and large, lava-filled basins on Mercury's surface [76]
1976	*Mariner 10* team discovers Mercury's magnetic field (with a surface strength about 1 % that of the Earth) and maps the planet's magnetosphere [77]
1978	NASA publishes the first detailed atlas of Mercury, based on *Mariner 10* observations and showing numerous craters and plains [78]
2004 Aug 3	*MESSENGER* probe launched From Cape Canaveral Air Force Station at 02:15:56 EDT [79]
2008 Jan 14	*MESSENGER*'s first flyby of Mercury at 19:04:39 UTC (closest approach: 200 km) [80]
2008 Jan 30	*MESSENGER* maps 50 % of Mercury's surface, m21 % of which was unseen by *Mariner 10*, thus bringing the total percentage of the mapped surface to 66 % [81]
	MESENGER discovers long, steep scarps (rupēs) on Mercury [82]
	MESENGER discovers a system of over 100 troughs (Pantheon Fossae) radiating from the centre of the Caloris basin [83]
	MESSENGER find that Mercury's magnetic field and magnetosphere have evolved in structure since *Mariner 10* [84]
	MESSENGER studies the mineral structure of Mercury's surface and detects sodium, calcium and hydrogen in the planet's exosphere [85]

Date	Event
	Space Exploration Era (continued)
2008 Oct 6	*MESSENGER*'s second flyby of Mercury [86]
2008 Oct 29	*MESSENGER* maps a further 24 % of the Mercurian surface (hitherto unseen), bringing the total percentage of surface mapped to 90 % [87]
	MESSENGER provides the first ever global view of the internal magnetic field of Mercury, the magnetic dipole being closely aligned with the planet's rotational axis [88]
	MESSENGER measures the extended tail of Mercury's exosphere [89]
	MESSENGER finds no hemispheric differences in the topopgraphy of Mercury (unlike Mars and the Moon, where such hemispherical differences are seen) [90]
2009 Sep 29	*MESSENGER* probe's third flyby of Mercury [91]
	MESSENGER maps a further hitherto unseen 6 % of the Mercurian surface (making 96 % of the total surface mapped, leaving only the polar regions still unobserved [92]
	MESSENGER measures 10–20 times less intensity of the neutral sodium tail than in the previous two flybys [93]
	MESSENGER find iron and titanium abundances in the Mercurian crust in similar amounts to those some lunar basalts [94]
2011 Mar 18	*MESSENGER* inserted into Mercury orbit at 00:45 UTC [95]

Bibliographical Notes

An Overview

[1] Antoniadi, E. M. 1974, *The Planet Mercury*, transl. Patrick Moore (Shaldon: Keith Reid), p. 10
[2] Caesar, *De Bello Gallico*, 6.17
[3] Tacitus, *Germania*, 9
[4] Heath, Thomas L. 1932, *Greek Astronomy* (London: J. M. Dent), pp. xv, xxvi and xxviii
[5] Krupp, E. C. 1979, 'Astronomers, pyramids and priests' in *In Search of Ancient Astronomies*, ed. E. C. Krupp (London: Chatto & Windus), p. 198
[6] Lull, José 2004, *La astronomía en el antiguo Egipto* (Valencia: Universitat de Valencia), p. 183
[7] Krauss, Rolf (n.d.), 'Stellar and solar components in ancient Egyptian mythology and royal ideology', in *Proc. SEAC 2010 Meeting* (in press), p. 2
[8] Neugebauer, O. 1969, *The Exact Sciences in Antiquity* (New York: Dover Publications), p. 101
[9] Thurston, Hugh 1994, *Early Astronomy* (New York: Springer), pp. 65–66
[10] O. Neugebauer, Astronomical Ccuneiform Texts, vol. III, (New York: Springer), p. 475
[11] Schaefer, Bradley, E. 2007, 'The latitude and epoch for the origin of the astronomical lore in MUL.APIN', Amer. Astron. Soc. Meeting 210, #42.05, *Bull. Amer. Astron. Soc.*, **38**, 157
[12] Newton, Robert R. 1976, *Ancient Planetary Observations and the Validity of Ephemeris Time*(Baltimore: Johns Hopkins University), pp. 135–38
[13] Mackenzie, Donald A. (n.d.), *Myths of Babylonia and Assyria* (London: Gresham), pp. 302–303
[14] Isaiah 46:1

T.J. Mahoney, *Mercury*, DOI 10.1007/978-1-4614-7951-2,

[15] *Codex Dresdensis (Codex Dresden)* 1975 (Graz: Akad. Druk. U. Verlag)
[16] Aveni, A. F. 1982, 'Archaeoastronomy in the Maya region', in *Archaeoastronomy in the New World*, ed. A. F. Aveni (Cambridge: Cambridge Univ. Press), p. 25
[17] Kelley, David H. 1980, 'Astronomical identities of Mesoamerican gods' *Archaeoastron.*, **2** (*J. Hist. Astron.*, **xi**), S20–S22
[18] Kak, Subash 2000, 'Birth and early development of Indian astronomy', in *Astronomy across Cultures: The History of Non-Western Astronomy* (Dordrecht: Kluwer)
[19] *Ibid.*
[20] Pannekoek, A. 1989, *A History of Astronomy* (New York: Dover), pp. 91–92
[21] Eberhard, W. & Henseling, R. 1993, 'Beitrg̈e zur Astronomie der Han Zeit', *Sitzungsberichte der Akademie der Wissenschaften, Phil.-Hist. Klasse* **V** and **XXIII**
[22] 'Mercury Fact Sheet'
http://nssdc.gsfc.nasa.gov/planetary/factsheet/mercuryfact.html
(retrieved 17 July 2011; unless otherwise indicated, all orbital and physical data cited for Mercury in this edition are taken from this source)
[23] Pannekoek, *op. cit.*, p. 92
[24] Ptolemy, *Handy Tables*: N. Halma (ed.) 1822–25, *Tables manuelles astronomiques de Ptolémé et de Theon*, 3 parts (Paris)
[25] van Dalen, Benno 2002, 'Islamic astronomical tables in China: The sources for the Huihui li', in *Astrophys. Sp. Sci. Lib.* 274, *History of Oriental Astronomy*, ed. S. M. Razaullah Ansari (Dordrecht: Kluwer), pp. 19–30
[26] Yano, Michio 2002, 'The first equation table for Mercury in the *Huihui li*', in *Astrophys. Sp. Sci. Lib.* 274, *History of Oriental Astronomy*, ed. S. M. Razaullah Ansari (Dordrecht: Kluwer), pp. 33–43
[27] *Sanjufīnī Zīj*, MS arabe 6040, Bibliotèque Nationale, Paris
[28] al-Bīrunī, abū al-Rayḥān Muḥammad b. Aḥmad 1954–56, *al-Qāntūn al-Masʿūdī* (Hyderabad)
[29] 'Wednesday'
http://en.wikipedia.org/wiki/Wednesday
(retrieved 16 July 2011)
[30] Cunningham, C. J. 2007, 'Schröter, Johann Hieronymus', in *Biographical Encyclopedia of Astronomers*, Vol. 2, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), pp. 1030–31
[31] Kokott, W. 2007, 'Harding, Carl Ludwig', in *Biographical Encyclopedia of Astronomers*, Vol. 1, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), p. 469
[32] Antoniadi, *op. cit.*, p. 25
[33] Beech, M. 2007, 'Denning, William Frederick', in *Biographical Encyclopedia of Astronomers*, Vol. 1, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), pp. 290–91
[34] Denning, W. F. 1915, 'Rotation periods of the planets', *J. R. Astron. Soc. Canada*, **9**, p. 285

[35] Beech, M. 2007, 'Schiaparelli, Giovanni Virginio', in *Biographical Encyclopedia of Astronomers*, Vol. 2, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), pp. 1020–21
[36] Schiaparelli, G. V. 1889, 'Sulla rotazione di Mercurio', *Astron. Nachr.*, **123**, 255
[37] *Ibid.*, 241–50
[38] Strauss, D. 2007, 'Lowell, Percival', in *Biographical Encyclopedia of Astronomers*, Vol. 1, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), pp. 710–12
[39] Lowell, P. 1897, 'Drawings of Mercury', *Astron. Nachr.*, **142**, 365–68
[40] Lowell, P. 1897, 'Mercury', *Astron. Nachr.*, **143**, 141–43
[41] Lowell, P. 1897, 'Mercury', *Popular Astron.*, 4, pp. 360–63
[42] Payne, W. W. 1899, 'The planet Mercury', *Popular Astron.*, **7**, 471
[43] *Ibid.*, 466–72
[44] *Ibid.*, 471
[45] Graff, K. 1929, 'Die physische Beschaffenheit des Planetensystems', in *Handbuch der Astrophysik*, Band IV, *Das Sonnensystem*, p. 358
[46] Sheehan, W. 2007, 'Antoniadi, Eugène Michael', in *Biographical Encyclopedia of Astronomers*, Vol. 1, ed. T. Hockey, V. Trimble & T. R. Williams (New York: Springer), pp. 49–50
[47] Antoniadi, E. M. 1933, 'The markings and rotation of Mercury', *J. R. Astron. Soc. Canada*, **27**, 404
[48] Carpenter, R. L. & Goldstein, R. M. 1963, 'Radar observations of Mercury', *Science*, **142**, 381–82
[49] Kotelnikov, V. A. 1964, *Vestn. Akad. Nauk. SSSR*, **2**, 39
[50] Evans, J. V., Brockelman, R. A., Henry, J. C., Hyde, G. M., Kraft, L. G., Reid, W. A. & Smith, W. W. 1965, 'Radio echo observations of Venus and Mercury at 23 cm wavelength', *Astron. J.*, **70**, 486–501
[51] Peale, S. J. & Gold, T. 1965, 'Rotation of the planet Mercury', *Nature*, **206**, 1240–41
[52] Pettengill, G. H. & Dyce, R. B. 1965, 'A radar determination of the rotation of the planet Mercury', *Nature*, **206**, 1240
[53] Colombo, G. 1965, 'Rotational period of the planet Mercury', *Nature*, **208**, 575
[54] Colombo, Giuseppe & Shapiro, Irwin I. 1966, 'The rotation of the planet Mercury', *Astrophy. J.*, **145**, 296–307
[55] de Jager, C. & Jappel, A. 1971, *Reports on Astronomy, Trans. Int. Astron. Union*, 14B (Dordrecht: Reidel), p. 378
[56] Krumenaker, L. E. 1978, 'Remarks on the nomenclature of Mercury', *Icarus*, **33**, 215–19
[57] Krumenaker, Laurence E. 1978, 'Note: Remarks on the nomenclature of Mercury', *Icarus*, **34**, 215
[58] Murray, J. B., Dollfus, A. & Smith, B. 1972, 'Cartography of the surface markings of Mercury', *Icarus*, **17**, 576–84
[59] Dollfus, A., Chapman, C. R., Davies, M. E., Gingerich, O., Goldstein, R., Guest, J., Morrison, D. & Smith, B. A. 1978, 'IAU nomenclature for albedo features on the planet Mercury', *Icarus*, **34**, 210–14
[60] Antoniadi 1974, *op. cit.*, ch. 3

[61] Sandner, Werner 1963, *The Planet Mercury* (London: Faber & Faber), pp. 15–20
[62] Miles, Howard 1988, *The Handbook of the British Astronomical Association* (London: Brit. Astron. Assoc.), p. 51
[63] Sidgwick, J. B. 1982, *Observational Astronomy for Amateurs*, rev. James Muirden (London: Pelham Books), pp. 85–90
[64] Roseveare, N. T. 1982, *Mercury's Perihelion from Le Verrier to Einstein* (Oxford: Clarendon Press)
[65] Gilvarry, J. J. 1953, 'Relativity advances of the perihelia of minor planets', *Publ. Astron. Soc. Pacific*, **65**, pp. 173–78
[66] Gilvarry, J. J. 1953, 'Relativity precession of the asteroid Icarus', *Phys. Rev.*, **89**, 1046
[67] Biswas, Sukumar 2000, *Astrophys. Sp. Sci. Lib.* **242**, *Cosmic Perspectives in Space Physics* (Dordrecht: Springer), p. 176
[68] Correia, Alexandre C. M. & Laskar, Jacques 2004, *Nature*, **429**, 848–50
[69] Dunne, James A. & Burgess, Eric 1978, *The Voyage of Mariner 10* (Washington, D.C.: NASA Scientific and Technical & Information Office), SP-424
http://history.nasa.gov/SP-424/sp424.htm
[70] Davies, Merton E., Dwornik, Stephen E., Gault, Donald E. & Strom, Robert G. 1978, *Atlas of Mercury* (Washington, D.C.: NASA Scientific and Technical & Information Office), SP-423
http://history.nasa.gov/SP-423/sp423.htm
[71] http://history.nasa.gov/SP-424/ch3.htm
[72] McAdams, Jim V., Horsewood, Jerry L. & Yen, Chen-wan L 1998, 'Discovery-class Mercury Orbiter trajectory design for the 2005 launch opportunity', in *Astrodynamics Specialist Conference, American Institute of Aeronautics and Astronautics/American Astronautical Society*, paper AIAA-98-4283 (Boston: AIAA), pp. 109–15
[73] McAdams, James V. 1999, 'A resilient mission design for the MESSENGER 2004 Mercury orbiter', in *50th International Astronautical Congress*, paper IAA-99-9AA.11.2.06 (Amsterdam), 13 pages
[74] Santo, Andrew G., Gold, Robert E., McNutt, Jr., Ralph L., Solomon, Sean C., Ercol, Carl J., Farquhar, Robert W., Hartka, Theodore J., Jenkins, Jason E., McAdams, James V., Mosher, Larry E., Persons, David F., Artis, David A., Bokulic, Robert S., Conde, Richard F., Dakermanji, George, Goss, Milton, Jr., E., Haley, David R., Heeres, Keeneth J., Maurer, Richard H., Moore Robert C., Rodberg, Elliot H., Stern, Theodore G., Wiley, Samuel R., Williams Bobby G., Yen, Chen-wan L. & Peterson, Max R. 2001, 'The MESSENGER Mission to Mercury: Spacecraft and mission design', *Planet. Sp. Science*, **49**, 1481–1500
[75] Gold, Robert E., Solomon, Sean C., McNutt, Jr., Ralph L., Santo, Andrew G., Abshire, James B., Acuña, Mario H., Afzal, Robert S., Anderson, Brian J., Andrews, G. Bruce, Bedini, Peter D., Cain, John, Cheng, Andrew F., Evans, Larry G., Feldman, William C., Follas, Robert B., Gloeckler, George, Goldsten, John O., Hawkins III, S. Edward., Izenberg, Noam R., Jaskulek, Stephen E., Ketchum, Eleanor A., Lankton, Mark R., Lohr, David A., Mauk, Barry H., McClintock, William E., Murchie, Scott L., Schlemm II, Charles E., Smith, David E., Starr, Richard D. &

Zurbuchen, Thomas H. 2001, 'The MESSENGER Mission to Mercury: Scientific payload', *Planet. Sp. Sci.*, **49**, 1467–79

[76] Solomon, Sean C., McNutt, Jr., Ralph L., Gold, Robert E., Acuña, Mario H., Baker, Daniel N., Boynton, William V., Chapman, Clark R., Cheng, Andrew F., Gloeckler, George., Head III, James W., Krimigis, Stamatios M., McClintock, William E., Murchie, Scott L., Peale, Stanton J., Phillips, Roger J., Robinson, Mark S., Slavin, James A., Smith, David E., Strom, Robert G., Trombka, Jacob I. & Zuber, Maria T. 2001, 'The MESSENGER Mission to Mercury: Scientific objectives and implementation', *Planet. Sp. Sci.*, **49**, 1445–65

[77] van Casteren, J. & Novara, M. 2011, 'BepiColombo Mission', *Mem. Soc. Astron. It.*, 82, 394–405

[78] Solomon, Sean C. 2011, 'A new look at the planet Mercury', *Phys. Today* **64(1)**, p. 51

[79] *Ibid.*

[80] van Casteren & Novara, *op. cit.*

[81] *Ibid.*

[82] www.nasa.gov/mission_pages/messenger/media/PressConf20120321.html

[83] Russell, Christopher T. & Luhmann, Janet G. 1997, 'Mercury: Magnetic field and magnetosphere', in *Encyclopedia of Planetary Sciences*, ed. James H. Shirley & Rhodes W. Fairbridge (Dordrecht: Kluwer). pp. 476–478

[84] Solomon, Sean C., private communication

[85] Zhang, Yuan-Chong 1997, 'Core, terrestrial planetary', in *Encyclopedia of Planetary Sciences*, ed. James H. Shirley & Rhodes W. Fairbridge (Dordrecht: Kluwer). pp. 160–61

[86] Benz, Willy, Slattery, Wayne L. & Cameron, A. G. W. 1988, 'Collisional stripping of Mercury's mantle', *Icarus*, 74, 516–28

[87] Cameron, A. G. W. 1985, 'The partial volatization of Mercury', *Icarus*, 64, 285–94

[88] Weidenschilling, S. J. 1978, 'Iron/silicate fractionation and the origin of Mercury', *Icarus*, **35**, 99–111

[89] Dunne & Burgess, *op. cit.*, ch. 7

[90] Solomon 2011, *op. cit.*, p. 53

[91] Spudis, P. D. 2001, 'The geological history of Mercury', in *Proc. Workshop on Mercury: Space Environment, Surface, and Interior*, ed. Mark Robinson & G. Jeffrey Taylor (Houston: Lunar & Planetary Sci. Inst.), pp. 100–101

[92] Shiga, David 2008, 'Bizarre spider scar found on Mercury's surface', *New Scientist*, **Jan 30**, NewScientist.com news service

[93] Schultz, Peter H. & Gault, Donald E. 1975, 'Seismic effects from major basin formations on the Moon and Mercury', *Earth, Moon, & Planets*, **12**, 159–75

[94] Spudis, *op. cit.*

[95] Wagner, R., Wolf, U., Ivanov, B. A. & Neukum G. 2001, in *Proc. Workshop on Mercury: Space Environment, Surface, and Interior*, ed. Mark Robinson & G. Jeffrey Taylor (Houston: Lunar & Planetary Sci. Inst.), pp. 106–107

[96] Lewis, John S. 2004, *Physics and Chemistry of the Solar System* (Burlington: Academic Press), p. 461
[97] Prockter, Louise 2005, 'Ice in the Solar System', Johns Hopkins APL Technical Digest, **26**.
[98] Slade, M., Butler, B. & Muhleman, D. 'Mercury VLA radar: A new look at end-member planet', Amer. Astron. Soc. 24th DPS Meeting, #13.01,*Bull. Amer. Astron. Soc.*, **24**, 956
[99] Harmon, J. K. 2007, 'Radar Imaging of Mercury', *Sp. Sci. Rev.*, **132**, 307–49
[100] Rawlins, K., Moses, J. I. & Zahnle, K. J. 'Exogenic sources of water for Mercury's polar ice', Amer. Astron. Soc. 27th DPS Meeting, #21.12,*Bull. Amer. Astron. Soc.*, **27**, 1117
[101] Solomon, 2011, *op. cit.*, page 54
[102] *Ibid.*
[103] Russell & Luhmann, *op. cit.*, p. 477
[104] Solomon, 2011, *op. cit.*, pp. 52–54 (the loading phenomenon is illustrated in figure 5)
[105] *Ibid.*, page 52
[106] Steigerwald, Bill 2009, 'Magnetic tornadoes could liberate Mercury's tenuous atmosphere', NASA Goddard Space Flight Center, http://www.nasa.gov/mission_pages/messenger/multimedia/magnetic_tornadoes.html (retrieved 19 July 2011)
[107] Solomon, 2011, *op. cit.*
[108] *Ibid.*, page 52
[109] Batson, Raymond M. 1990, 'Cartography', in *Planetary Mapping*, ed. Ronald Greeley & Raymond M. Batson (Cambridge: Cambridge University Press), p. 60
[110] Becker, K. J., Robinson, M. S., Becker, T. L., Weller, L. A., Turner, S., Nguyen, L., Selby, C., Denevi, B. W., Murchie, S. L. McNutt, R. L. & Solomon, S. C. 'Near global mosaic of Mercury, *Eos*, 90(52) 2009 Dec. 29, Fall Meet. Suppl., Abstract P21A-1189
[111] www.nasa.gov/mission_pages/messenger/media/PressConf20121129.html
[112] Lawrence, D. J., Feldman, W. C., Godlsten, J. O., Maurice, S., Peplowski, P. N., Anderson, B. J., Bazell, D., McNutt Jr., R. L., Nittler, L. R., Prettyman, T. H., Rodgers, D. J., Solomon, S. C. & Weider, S. Z. 2012, 'Evidence for water ice near Mercury's north pole from MESSENGER Neutron Spectrometer measurements' DOI: 10.1126/science.1229953
[113] Newumann, G. A., Cavanaugh, J. F., Sun, X., Mazarico, E. M., Smith, D. E., Zuber, M. T., Mao, D. Paige, D. A., Solomon, S. C., Ernst, C. M. & Barnouin, O. S. 2012, 'Bright and dark polar deposits on Mercury: Evidence for surface volatiles', DOI: 10.1126/science.1229764
[114] Paige, D. A., Siegler, M. A., Harmon, J. K., Neumann, G. A., Mazarico, E. M., Smith, D. E., Zuber, M. T., Harju, E., Delitsky, M. L. & Solomon, S. C. 2012, 'Thermal stability of volatiles in the north polar region of Mercury' DOI: 10.1126/science.1231106

Pronunciation Guide

[1] Jones, Daniel 1972, *An Outline of English Phonetics* 9th edn (Cambridge: Cambridge University Press)
[2] Merriam, G. & C. 1972, *Webster's Biographical Dictionary* (Springfield: C. & C. Merriam)
[3] Merriam-Webster 1998, *Merriam-Webster's Collegiate Dictionary*, 10th edn (Springfield: Merriam-Webster)
[4] Lemprière, J. 1984, *Lemprière's Classical Dictionary* (London: Bracken Books)

Gazetteer of Mercury

[1] Turne, Jane (ed.) 1996, *The Dictionary of Art*, 33 vols (New York: Macmillan)
[2] Encyclopaedia Britannica 1993, *The New Encyclopaedia Britannica* (Chicago: Encyclopaedia Britannica)
[3] en.wikipedia.org/wiki/Abu_Nuwas#cite_ref-Gp2_0-0 (retrieved 10 June 2012)
[4] Antoniadi, E. M. 1934, *La Planète Mercure* (Paris: Gauthier-Villars)
[5] Autenrieth, Georg 1891, *A Homeric Dictionary* (New York: Harper)
[6] Encyclopaedia Britannica, *op. cit.*
[7] *Ibid.*
[8] Lowell, Percival 1897a, 'New observations of the planet Mercury', *Mem. Amer. Acad. Arts & Sci.*, **12**, 433–466
[9] Liddell, H. G. & Scott, R. 1940, *A Greek–English Lexicon* (Oxford: Clarendon Press)
[10] Lowell 1897a, *op. cit.*
[11] Liddell & Scott, *op. cit.*
[12] Encyclopaedia Britannica, *op. cit.*
[13] en.wikipedia.org/wiki/Ahmad_Baba_al_Massufi (retrieved 11 June 2012)
[14] Merriam, G. & C. 1974, *Webster's Biographical Dictionary* (Springfield: C. & C. Merriam)
[15] Merriam, *op. cit.*
[16] en.wikipedia.org/wiki/Sergey_Aksakov (retrieved 11 June 2012)
[17] Lowell 1897a, *op. cit.*
[18] Lewis, C. T. & Short, C. *A Latin Dictionary* (Oxford: Clarendon Press)
[19] Lowell, Percival 1897b, 'Mercury', *Popular Astron.*, **4**, 360–363
[20] Lewis & Short, *op. cit.*
[21] Encyclopaedia Britannica, *op. cit.*
[22] fr.wikipedia.org/wiki/Aal-Akhtal (retrieved 11 June 2012)
[23] Encyclopaedia Britannica, *op. cit.*
[24] Morrison, David (no date), unpublished list of names for Mercury nomenclature

[25] en.wikipedia.org/wiki/Maqamat_Badi'_al-Hamadhani (retrieved 11 June 2012)
[26] Morrison, *op. cit.*
[27] en.wikipedia.org/wiki/Al-Jahiz (retrieved 11 June 2012)
[28] Gaze, Delia (ed.) 1997, *Dictionary of Women Artists* (Chicago/London: Fitzroy Dearborn Publishers)
[29] Morrison, *op. cit.*
[30] en.wikipedia.org/wiki/Imru_al-Qais (retrieved 11 June 2012)
[31] Morrison, *op. cit.*
[32] en.wikipedia.org/wiki/Andal (retrieved 11 June 2012)
[33] Lowell 1897a, *op. cit.*
[34] Lewis & Short, *op. cit.*
[35] Lowell 1897b, *op. cit.*
[36] Lewis & Short, *op. cit.*
[37] Morrison, *op. cit.*
[38] planetarynames.wr.usgs.gov/Feature/298;sessionaid=160A7E504ECCA2C0D8FEA625490CD5BF (retrieved 11 June 2012)
[39] Lowell 1897a, *op. cit.*
[40] Liddell & Scott, *op. cit.*
[41] Merriam, *op. cit.*
[42] Liddell & Scott, *op. cit.*
[43] International Astronomical Union 1958–2003, *Transactions*, **XB–XXVB**
[44] Lewis & Short, *op. cit.*
[45] Encyclopaedia Britannica, *op. cit.*
[46] Lowell 1897b, *op. cit.*
[47] Lewis & Short, *op. cit.*
[48] *Ibid.*
[49] Encyclopaedia Britannica, *op. cit.*
[50] Lewis & Short, *op. cit.*
[51] Morrison, *op. cit.*
[52] Guillon, Jacques 1986, *Dumont d'Urville* (Paris: France-Empire)
[53] Encyclopaedia Britannica, *op. cit.*
[54] Coulson, Michael 2003, *Teach Yourself Sanskrit* (London: Hodder Headline)
[55] Szarkowski, J. & Hambourg, M. M. 1981, *The Work of Atget*, vol. 1 (New York: Museum of Modern Art)
[56] International Astronomical Union, *op. cit.*
[57] Lewis & Short *op. cit.*
[58] International Astronomical Union, *op. cit.*
[59] Lewis & Short *op. cit.*
[60] Encyclopaedia Britannica, *op. cit.*
[61] Morrison, *op. cit.*
[62] Mojares, Resil B. 1983, *Origin and Rise of the Filipino Novel: A Generic Study of the Novel until 1940* (Quezon City: University of the Philippines Press)

[63] Europa Publications 1992, *International Who's Who 1992–93* (London: Europa Publications)
[64] Merriam, *op. cit.*
[65] Encyclopaedia Britannica, *op. cit.*
[66] *Ibid.*
[67] en.wikipedia.org/wiki/Postinik_Yakovlev (retrieved 11 June 2012)
[68] Encyclopaedia Britannica, *op. cit.*
[69] Morrison, *op. cit.*
[70] en.wikipedia.org/wiki/Matsuo_Bashō (retrieved 11 June 2012)
[71] Encyclopaedia Britannica, *op. cit.*
[72] Gaze, *op. cit.*
[73] Encyclopaedia Britannica, *op. cit.*
[74] Turne, *op. cit.*
[75] Aldred, Cyril 1991, *Akhenaten, King of Egypt* (London: Thames & Hudson)
[76] Encyclopaedia Britannica, *op. cit.*
[77] en.wikipedia.org/wiki/Vissarion_Belinsky (retrieved 11 June 2012)
[78] Morrison, *op. cit.*
[79] Prado, Juan Guillermo 2008–2010, 'Reflexiones en torno a la nacionalidad chilena de Andrés Bello', *Revista Chilena de Historia y Geografía*, 219–230
[80] Riggs, Thomas (ed.) 1997, *St. James Guide to Black Artists* (Detroit: St. James Press)
[81] Turne, *op. cit.*
[82] Aarssen, J. & Backus, A.2009, *Colloquial Turkish* (London: Routledge)
[83] Encyclopaedia Britannica, *op. cit.*
[84] *Ibid.*
[85] Larson, Harold 1944, *Björnstjerne Björnson: A Study in Norwegian Nationalism* (New York: King's Crown Press)
[86] Encyclopaedia Britannica, *op. cit.*
[87] *Ibid.*
[88] Lewis & Short *op. cit.*
[89] International Astronomical Union, *op. cit.*
[90] Lewis & Short *op. cit.*
[91] Morrison, *op. cit.*
[92] Lewis & Short *op. cit.*
[93] Morrison, *op. cit.*
[94] Lightbown, Ronald 1989, *Sandro Botticelli: Life and Work* (New York: Abbeville Publishing Group)
[95] Lowell 1897a, *op. cit.*
[96] Liddell & Scott, *op. cit.*
[97] Encyclopaedia Britannica, *op. cit.*
[98] *Ibid.*
[99] *Ibid.*
[100] *Ibid.*
[101] *Ibid.*

[102] Jobes, G. 1962, *Dictionary of Mythology, Folklore, and Symbols*, 3 vols (New York: Scarecrow Press)
[103] en.wikipedia.org/wiki/Budha
(retrieved 11 June 2012)
[104] Encyclopaedia Britannica, *op. cit.*
[105] *Ibid.*
[106] International Astronomical Union, *op. cit.*
[107] Lewis & Short *op. cit.*
[108] Lowell 1897b, *op. cit.*
[109] Lewis & Scott, *op. cit.*
[110] Lowell 1897a, *op. cit.*
[111] Lewis & Short *op. cit.*
[112] Encyclopaedia Britannica, *op. cit.*
[113] en.wikipedia.org/wiki/Callicrates
(retrieved 12 June 2012)
[114] Morrison, *op. cit.*
[115] Lewis & Scott, *op. cit.*
[116] Morrison, *op. cit.*
[117] Lewis & Scott, *op. cit.*
[118] McLaughlin, M. 1998, *Italo Calvino* (Edinburgh: Edinburgh University Press)
[119] Encyclopaedia Britannica, *op. cit.*
[120] *Ibid.*
[121] Lowell 1897a, *op. cit.*
[122] Cook, Arthur Bernard 1914, *Zeus: A Study in Ancient Religion*, vol. 1, *Zeus God of the Bright Sky* (Cambridge: Cambridge University Press), p. 411.
[123] Encyclopaedia Britannica, *op. cit.*
[124] *Ibid.*
[125] *Ibid.*
[126] en.wikipedia.org/wiki/Pyotr_Ilyich_Tchaikovsky
(retrieved 11 June 2012)
[127] Encyclopaedia Britannica, *op. cit.*
[128] en.wikipedia.org/wiki/Zhao_Mengfu
(retrieved 11 June 2012)
[129] Encyclopaedia Britannica, *op. cit.*
[130] A. P. Chekhov 1993, *Povyesti i Rasskazy* (Moscow: Olimp)
[131] Lowell 1897b, *op. cit.*
[132] Pausanias, *Description of Greece*, VIII, vii, 5 (Cambridge, Mass.: Heinemann)
[133] Morrison, *op. cit.*
[134] en.wikipedia.org/wiki/Jiang_Kui
(retrieved 11 June 2012)
[135] Lowell 1897a, *op. cit.*
[136] Lewis & Scott *op. cit.*
[137] Morrison, *op. cit.*
[138] south-korea.discover-theworld.com/?id=5&title=Famous+Personalities
(retrieved 11 June 2012)
[139] Encyclopaedia Britannica, *op. cit.*

[140] en.wikipedia.org/wiki/Frédéric_Chopin (retrieved 11 June 2012)
[141] Encyclopaedia Britannica, *op. cit.*
[142] en.wikipedia.org/wiki/Bada_Shanren (retrieved 11 June 2012)
[143] Encyclopaedia Britannica, *op. cit.*
[144] Merriam, *op. cit.*
[145] Encyclopaedia Britannica, *op. cit.*
[146] Lowell 1897a, *op. cit.*
[147] Lewis & Short *op. cit.*
[148] Lowell 1897a, *op. cit.*
[149] Lewis & Short *op. cit.*
[150] Encyclopaedia Britannica, *op. cit.*
[151] Merriam, *op. cit.*
[152] International Astronomical Union, *op. cit.*
[153] Lewis & Short *op. cit.*
[154] Lowell 1897a, *op. cit.*
[155] Lewis & Short *op. cit.*
[156] Lowell 1897b, *op. cit.*
[157] Lewis & Short *op. cit.*
[158] Turne, *op. cit.*
[159] en.wikipedia.org/wiki/Salvador_Dalí (retrieved 11 June 2012)
[160] Encyclopaedia Britannica, *op. cit.*
[161] Merriam, *op. cit.*
[162] Encyclopaedia Britannica, *op. cit.*
[163] Roemer, Kenneth M. 1997, *Dictionary of Literary Biography*,vol. 175, *Native American Writers of the United States* (Detroit: Gale Research)
[164] Encyclopaedia Britannica, *op. cit.*
[165] Arnason, H. H. & Prather, M. F. 1998, *History of Modern Art* (New York: Harry N. Abrams)
[166] Encyclopaedia Britannica, *op. cit.*
[167] en.wikipedia.org/wiki/Garvirla_Derhavin (retrieved 11 June 2012)
[168] Encyclopaedia Britannica, *op. cit.*
[169] *Ibid.*
[170] Lowell 1897a, *op. cit.*
[171] www.theoi.com/Olympios/Hermes.html (retrieved 11 June 2012)
[172] Encyclopaedia Britannica, *op. cit.*
[173] Lowell 1897a, *op. cit.*
[174] Liddell & Scott *op. cit.*
[175] Gaze, *op. cit.*
[176] Encyclopaedia Britannica, *op. cit.*
[177] *Ibid.*
[178] en.wikipedia.org/wiki/Fyodor_Dostoyevsky (retrieved 11 June 2012)
[179] Encyclopaedia Britannica, *op. cit.*
[180] *Ibid.*

[181] Encyclopaedia Britannica, *op. cit.*
[182] en.wikipedia.org/wiki/Antonín Dvořák (retrieved 11 June 2012)
[183] Roemer, *op. cit.*
[184] Lowell 1897a, *op. cit.*
[185] Lewis & Short *op. cit.*
[186] Encyclopaedia Britannica, *op. cit.*
[187] Morrison, *op. cit.*
[188] en.wikipedia.org/wiki/Kanō_Eitoku (retrieved 11 June 2012)
[189] Merriam, *op. cit.*
[190] Encyclopaedia Britannica, *op. cit.*
[191] Lowell 1897a, *op. cit.*
[192] Liddell & Scott, *op. cit.*
[193] Encyclopaedia Britannica, *op. cit.*
[194] Lowell 1897a, *op. cit.*
[195] Liddell & Scott *op. cit.*
[196] Europa Publications, *op. cit.*
[197] en.wikipedia.org/wiki/Igbo_language (retrieved 11 June 2012)
[198] Encyclopaedia Britannica, *op. cit.*
[199] en.wikipedia.org/wiki/Olaudah_Equiano (retrieved 11 June 2011)
[200] Merriam, *op. cit.*
[201] Encyclopaedia Britannica, *op. cit.*
[202] en.wikipedia.org/wiki/Afanasy_Fet (retrieved 11 June 2011)
[203] Lowell 1897b, *op. cit.*
[204] Lewis & Short *op. cit.*
[205] Merriam, *op. cit.*
[206] en.wikipedia.org/wiki/Ferdowsi (retrieved 11 June 2011)
[207] Encyclopaedia Britannica, *op. cit.*
[208] Europa Publications, *op. cit.*
[209] Morrison, *op. cit.*
[210] en.wikipedia.org/wiki/Fram (retrieved 11 June 2012)
[211] Encyclopaedia Britannica, *op. cit.*
[212] en.wikipedia.org/wiki/Futabei_Shimei (retrieved 11 June 2012)
[213] Encyclopaedia Britannica, *op. cit.*
[214] International Astronomical Union, *op. cit.*
[215] Liddell & Scott *op. cit.*
[216] Encyclopaedia Britannica, *op. cit.*
[217] Gaze, *op. cit.*
[218] Encyclopaedia Britannica, *op. cit.*
[219] Bushrui, S. & Jenkins, J. 1998, *Kahlil Gibran, Man and Poet: A New Biography* (Oneworld Publications)

[220] en.wikipedia.org/wiki/Khalil_Gibran
(retrieved 11 June 2012)
[221] Encyclopaedia Britannica, *op. cit.*
[222] *Ibid.*
[223] en.wikipedia.org/wiki/Gjøa
(retrieved 11 June 2012)
[224] Prokhorov, Alexander (ed.) 1974–83, *Great Soviet Encyclopedia*, 3rd edn, 31 volumes (Macmillan)
[225] en.wikipedia.org/wiki/Mikhail_Glinka
(retrieved 11 June 2012)
[226] Encyclopaedia Britannica, *op. cit.*
[227] *Ibid.*
[228] *Ibid.*
[229] Gogol', N. V. 1984, *Izbrannye Sochinyeniya*, 2 vols (Moscow: Khudozhestvyennaya Lityeratura)
[230] Morrison, *op. cit.*
[231] en.wikipedia.org/wiki/Goldstone_Deep_Space_Communications_Complex
(retrieved 11 June 2012)
[232] Encyclopaedia Britannica, *op. cit.*
[233] Merriam, *op. cit.*
[234] Encyclopaedia Britannica, *op. cit.*
[235] Gaze, *op. cit.*
[236] Encyclopaedia Britannica, *op. cit.*
[237] Morrison, *op. cit.*
[238] en.wikipedia.org/wiki/Frans_Hals
(retrieved 11 June 2012)
[239] Encyclopaedia Britannica, *op. cit.*
[240] Morrison, *op. cit.*
[241] en.wikipedia.org/wiki/Han_Gan
(retrieved 11 June 2012)
[242] Encyclopaedia Britannica, *op. cit.*
[243] en.wikipedia.org/wiki/Suzuki_Harunobu
(retrieved 11 June 2012)
[244] Encyclopaedia Britannica, *op. cit.*
[245] *Ibid.*
[246] *Ibid.*
[247] Morrison, *op. cit.*
[248] www.haystack.mit.edu
(retrieved 11 June 2012)
[249] Encyclopaedia Britannica, *op. cit.*
[250] Lowell 1897a, *op. cit.*
[251] Liddell & Scott *op. cit.*
[252] Encyclopaedia Britannica, *op. cit.*
[253] Antoniadi, *op. cit.*
[254] Lewis & Short *op. cit.*
[255] International Astronomical Union, *op. cit.*
[256] Lewis & Short *op. cit.*
[257] Goring, Rosemary (ed.)1994, *Larousse Dictionary of Writers* (New York: Larousse)

[258] Merriam, *op. cit.*
[259] Lowell 1897a, *op. cit.*
[260] Liddell & Scott, *op. cit.*
[261] Morrison, *op. cit.*
[262] en.wikipedia.org/wiki/Nathaniel_Palmer (retrieved 11 June 2012)
[263] Encyclopaedia Britannica, *op. cit.*
[264] Lewis & Short *op. cit.*
[265] International Astronomical Union, *op. cit.*
[266] Liddell & Scott *op. cit.*
[267] Morrison, *op. cit.*
[268] en.wikipedia.org/wiki/Hiroshige (retrieved 11 June 2012)
[269] Encyclopaedia Britannica, *op. cit.*
[270] en.wikipedia.org/wiki/Kakinomoto_no_Hitomaro (retrieved 11 June 2012)
[271] Gaze, *op. cit.*
[272] Turne, *op. cit.*
[273] en.wikipedia.org/wiki/Hokusai (retrieved 11 June 2012)
[274] Encyclopaedia Britannica, *op. cit.*
[275] *Ibid.*
[276] Merriam, *op. cit.*
[277] Encyclopaedia Britannica, *op. cit.*
[278] Lewis & Short *op. cit.*
[279] Morrison, *op. cit.*
[280] Lewis & Short *op. cit.*
[281] Antoniadi, *op. cit.*
[282] Turne, *op. cit.*
[283] Encyclopaedia Britannica, *op. cit.*
[284] Morrison, *op. cit.*
[285] Coe, Michael D. & van Stone, Mark 2001, *Reading the Maya Glyphs* (London: Thames & Hudson)
[286] Lowell 1897a, *op. cit.*
[287] Lewis & Short *op. cit.*
[288] Lowell 1897b, *op. cit.*
[289] No other reference found for *Hyphates*
[290] Encyclopaedia Britannica, *op. cit.*
[291] *Ibid.*
[292] en.wikipedia.org/wiki/Ictinus (retrieved 11 June 2012)
[293] Encyclopaedia Britannica, *op. cit.*
[294] en.wikipedia.org/wiki/Imhotep (retrieved 11 June 2012)
[295] Encyclopaedia Britannica, *op. cit.*
[296] Antoniadi, *op. cit.*
[297] Lewis & Short, *op. cit.*
[298] Gaze, *op. cit.*
[299] Encyclopaedia Britannica, *op. cit.*

[300] *Ibid.*
[301] en.wikipedia.org/wiki/Mór_Jókai (retrieved 11 June 2012)
[302] Encyclopaedia Britannica, *op. cit.*
[303] en.wikipedia.org/wiki/Judah_Halevi (retrieved 11 June 2012)
[304] Encyclopaedia Britannica, *op. cit.*
[305] en.wikipedia.org/wiki/Kālidāsa (retrieved 12 June 2012)
[306] Encyclopaedia Britannica, *op. cit.*
[307] Morrison, *op. cit.*
[308] en.wikipedia.org/wiki/Yoshida_Kenkō (retrieved 12 June 2012)
[309] Lowell 1897a, *op. cit.*
[310] Hesiod, *Theogony*,
[311] Lowell 1897a, *op. cit.*
[312] Liddell & Scott, *op. cit.*
[313] Merriam, *op. cit.*
[314] en.wikipedia.org/wiki/André_Jertész (retrieved 12 June 2012)
[315] Lowell 1897a, *op. cit.*
[316] Liddell & Scott, *op. cit.*
[317] Encyclopaedia Britannica, *op. cit.*
[318] en.wikipedia.org/wiki/Al-Khansa (12 June 2012)
[319] Goring, *op. cit.*
[320] Grobel, L. 1970, 'Ghana's Vincent Kofi', *African Arts*, **3(4)**
[321] Kofi, Vincent Akwete 1964, *Sculpture in Ghana* (Accra: Ghana Information Services)
[322] Morrison, *op. cit.*
[323] www.onmarkproductions.com/html/busshi-buddha-sculptors-kamakura-era-japan.html (retrieved 12 June 2012)
[324] Lowell 1897a, *op. cit.*
[325] Liddell & Scott, *op. cit.*
[326] Encyclopaedia Britannica, *op. cit.*
[327] en.wikipedia.org/wiki/Guan_Hanqing (12 June 2012)
[328] Encyclopaedia Britannica, *op. cit.*
[329] Turne, *op. cit.*
[330] en.wikipedia.org/wiki/Kunisada (retrieved 12 June 2012)
[331] Lowell 1897a, *op. cit.*
[332] Bain, David 1995, 'περιηίγεσχαι as a medical term and a conjecture in the Cyranides', in *Ethics and Rhetoric: Classical Essays for Donald Russell on His Seventy-Fifth Birthday* (Oxford: Clarendon Press), p. 283
[333] Morrison, *op. cit.*
[334] en.wikipedia.org/wiki/Kinko_Kurosawa (retrieved 13 June 2012)
[335] Gaze, *op. cit.*

[336] Lowell 1897b, *op. cit.*
[337] Lewis & Short *op. cit.*
[338] Encyclopaedia Britannica, *op. cit.*
[339] *Ibid.*
[340] en.wikipedia.org/wiki/Mikhail_Lermontov
(retrieved 12 June 2012)
[341] Encyclopaedia Britannica, *op. cit.*
[342] *Ibid.*
[343] en.wikipedia.org/wiki/Liang_Kai
(retrieved 12 June 2012)
[344] Lowell 1897b, *op. cit.*
[345] Lewis & Short *op. cit.*
[346] Lowell 1897a, *op. cit.*
[347] Lewis & Short *op. cit.*
[348] Lowell 1897a, *op. cit.*
[349] Vitruvius Pollio 1912, *De Architectura*, ed. F. Krohn (Leipsig: Teubner)
[350] Lowell 1897a, *op. cit.*
[351] Vitruvius Pollio, *op. cit.*
[352] Lowell 1897a, *op. cit.*
[353] Vitruvius Pollio, *op. cit.*
[354] Lowell 1897a, *op. cit.*
[355] Vitruvius Pollio, *op. cit.*
[356] Encyclopaedia Britannica, *op. cit.*
[357] en.wikipedia.org/wiki/Li_Qingzhao
(retrieved 12 June 2012)
[358] International Astronomical Union, *op. cit.*
[359] Antoniadi, *op. cit.*
[360] Encyclopaedia Britannica, *op. cit.*
[361] en.wikipedia.org/wiki/Li_Bai
(retrieved 12 June 2012)
[362] Reid, D. R. 1988, *A Concise History of Canadian Painting* (Toronto: Oxford University Press)
[363] Encyclopaedia Britannica, *op. cit.*
[364] *Ibid.*
[365] en.wikipedia.org/wiki/Lu_Xun
(retrieved 12 June 2012)
[366] Lowell 1897b, *op. cit.*
[367] Lewis & Short, *op. cit.*
[368] Encyclopaedia Britannica, *op. cit.*
[369] Lewis & Short, *op. cit.*
[370] Encyclopaedia Britannica, *op. cit.*
[371] Morrison, *op. cit.*
[372] en.wikipedia.org/wiki/Ma_Zhiyuan
(retrieved 12 June 2012)
[373] Merriam, *op. cit.*
[374] Encyclopaedia Britannica, *op. cit.*
[375] *Ibid.*
[376] Lewis & Short, *op. cit.*
[377] Lowell 1897b, *op. cit.*

[378] Lewis & Short, *op. cit.*
[379] Encyclopaedia Britannica, *op. cit.*
[380] *Ibid.*
[381] en.wikipedia.org/wiki/Ustad_Mansur
(retrieved 12 June 2012)
[382] Encyclopaedia Britannica, *op. cit.*
[383] es.wikipedia.org/wiki/Ausiàs_March
(retrieved 12 Junce 2012)
[384] Encyclopaedia Britannica, *op. cit.*
[385] *Ibid.*
[386] *Ibid.*
[387] Turne, *op. cit.*
[388] en.wikipedia.org/wiki/Iwasa_Matabei
(13 June 2012)
[389] Encyclopaedia Britannica, *op. cit.*
[390] *Ibid.*
[391] *Ibid.*
[392] Merriam, *op. cit.*
[393] Encyclopaedia Britannica, *op. cit.*
[394] Lowell 1897b, *op. cit.*
[395] Lewis & Short, *op. cit.*
[396] Lewis & Short, *op. cit.*
[397] Lowell 1897a, *op. cit.*
[398] Vitruvius Pollio, *op. cit.*
[399] Lowell 1897a, *op. cit.*
[400] Vitruvius Pollio, *op. cit.*
[401] Lowell 1897a, *op. cit.*
[402] Vitruvius Pollio, *op. cit.*
[403] Lowell 1897a, *op. cit.*
[404] Vitruvius Pollio, *op. cit.*
[405] Lowell 1897a, *op. cit.*
[406] Vitruvius Pollio, *op. cit.*
[407] Encyclopaedia Britannica, *op. cit.*
[408] *Ibid.*
[409] pl.wikipedia.org/wiki/Adam_Mickiewicz
(retrieved 12 June 2012)
[410] Encyclopaedia Britannica, *op. cit.*
[411] *Ibid.*
[412] en.wikipedia.org/wiki/Fabian_Gottlieb_von_Bellingshausen
(retrieved 12 June 2012)
[413] Encyclopaedia Britannica, *op. cit.*
[414] *Ibid.*
[415] en.wikipedia.org/wiki/Thomas_Mofolo
(retrieved 12 June 2012)
[416] Encyclopaedia Britannica, *op. cit.*
[417] *Ibid.*
[418] *Ibid.*
[419] Riggs *op. cit.*
[420] Encyclopaedia Britannica, *op. cit.*

[421] Turne, *op. cit.*
[422] en.wikipedia.org/wiki/Edvard_Munch
(retrieved 12 June 2012)
[423] István, B. 2002, *Hungary and the Hungarians* (Budapest: Corvina Kaidó)
[424] en.wikipedia.org/wiki/Mihály_Munkácsy
(retrieved 12 June 2012)
[425] Encyclopaedia Britannica, *op. cit.*
[426] en.wikipedia.org/wiki/Murasaki_Shikibu
(retrieved 12 June 2012)
[427] Encyclopaedia Britannica, *op. cit.*
[428] en.wikipedia.org/wiki/Modest_Mussorgsky
(retrieved 12 June 2012)
[429] Encyclopaedia Britannica, *op. cit.*
[430] en.wikipedia.org/wiki/Myron
(retrieved 13 June 2012)
[431] Merriam, *op. cit.*
[432] en.wikipedia.org/wiki/Vladimir_Nabokov
(retrieved 12 June 2012)
[433] Morrison, *op. cit.*
[434] en.wikipedia.org/wiki/Nampeyo
(retrieved 12 June 2012)
[435] Prokhorov, *op. cit.*
[436] en.wikipedia.org/wiki/Ali-Shir_Nava'i
(retrieved 12 June 2012)
[437] Sheldon, J. & Nogelmaier, P. 1988, *The Biography of Joseph K. Nāwahī*
(Honolulu: Hawaiian Historical Society)
[438] Lowell 1897a, *op. cit.*
[439] Liddell & Scott, *op. cit.*
[440] Antoniadi *op. cit.*
[441] Lewis & Short, *op. cit.*
[442] Merriam, *op. cit.*
[443] Encyclopaedia Britannica, *op. cit.*
[444] Lowell 1897a, *op. cit.*
[445] Vitruvius Pollio, *op. cit.*
[446] Lowell 1897a, *op. cit.*
[447] Vitruvius Pollio, *op. cit.*
[448] Lowell 1897b, *op. cit.*
[449] Lewis & Short, *op. cit.*
[450] Encyclopaedia Britannica, *op. cit.*
[451] *Ibid.*
[452] en.wikpedia.org/wiki/Nizami_Ganjavi
(retrieved 12 June 2012)
[453] Lowell 1897a, *op. cit.*
[454] Liddell & Scott, *op. cit.*
[455] Merriam, *op. cit.*
[456] en.wikipedia.org/wiki/Rudolf_Nureyev
(retrieved 12 June 2012)
[457] Morrison, *op. cit.*

[458] en.wikipedia.org/wiki/Odin
(retrieved 17 June 2012)
[459] Encyclopaedia Britannica, *op. cit.*
[460] en.wikipedia.org/wiki/Maruyama_Ōkyo
(retrieved 12 June 2012)
[461] Lowell 1897a, *op. cit.*
[462] Liddell & Scott, *op. cit.*
[463] Lowell 1897b, *op. cit.*
[464] Liddell & Scott *op. cit.*
[465] Lowell 1897b, *op. cit.*
[466] Liddell & Scott *op. cit.*
[467] Lowell 1897a, *op. cit.*
[468] Liddell & Scott *op. cit.*
[469] Roemer, *op. cit.*
[470] Encyclopaedia Britannica, *op. cit.*
[471] Lewis & Short, *op. cit.*
[472] Encyclopaedia Britannica, *op. cit.*
[473] Lewis & Short, *op. cit.*
[474] Lowell 1897a, *op. cit.*
[475] Vitruvius Pollio, *op. cit.*
[476] Lowell 1897a, *op. cit.*
[477] Vitruvius Pollio, *op. cit.*
[478] Lowell 1897a, *op. cit.*
[479] Vitruvius Pollio, *op. cit.*
[480] Lowell 1897b, *op. cit.*
[481] Vitruvius Pollio, *op. cit.*
[482] Lowell 1897a, *op. cit.*
[483] Vitruvius Pollio, *op. cit.*
[484] Lowell 1897b, *op. cit.*
[485] Vitruvius Pollio, *op. cit.*
[486] Lowell 1897a, *op. cit.*
[487] Vitruvius Pollio, *op. cit.*
[488] Lowell 1897a, *op. cit.*
[489] Vitruvius Pollio, *op. cit.*
[490] Lowell 1897b, *op. cit.*
[491] Vitruvius Pollio, *op. cit.*
[492] Gaze, op. cit.
[493] Lowell 1897a, *op. cit.*
[494] Liddell & Scott, *op. cit.*
[495] Lowell 1897a, *op. cit.*
[496] Lewis & Short, *op. cit.*
[497] International Astronomical Union, *op. cit.*
[498] Antoniadi, *op. cit.*
[499] Lowell 1897b, *op. cit.*
[500] Lewis & Short, *op. cit.*
[501] Lowell 1897a, *op. cit.*
[502] Lewis & Short, *op. cit.*
[503] Merriam, *op. cit.*
[504] Encyclopaedia Britannica, *op. cit.*

[505] International Astronomical Union, *op. cit.*
[506] Liddell & Scott, *op. cit.*
[507] Lowell 1897a, *op. cit.*
[508] Detienne, Marcel 1989, *The Writing of Orpheus: Greek Myth in Cultural Context* (Maryland: Johns Hopkins University Press), p. 74
[509] Lowell 1897a, *op. cit.*
[510] Autenrieth, *op. cit.*
[511] Encyclopaedia Britannica, *op. cit.*
[512] en.wikipedia.org/wiki/Phidias (retrieved 13 June 2012)
[513] Encyclopaedia Britannica, *op. cit.*
[514] Lewis & Short, *op. cit.*
[515] Turne, *op. cit.*
[516] International Astronomical Union, *op. cit.*
[517] Lewis & Short, *op. cit.*
[518] Encyclopaedia Britannica, *op. cit.*
[519] Lowell 1897b, *op. cit.*
[520] Liddell & Scott, *op. cit.*
[521] Lowell 1897a, *op. cit.*
[522] Liddell & Scott, *op. cit.*
[523] International Astronomical Union, *op. cit.*
[524] Lewis & Short, *op. cit.*
[525] Antoniadi, *op. cit.*
[526] Lewis & Short, *op. cit.*
[527] Encyclopaedia Britannica, *op. cit.*
[528] en.wikipedia.org/wiki/Bai_Juyi (retrieved 12 June 2012)
[529] Merriam, *op. cit.*
[530] Lowell 1897a, *op. cit.*
[531] en.wikipedia.org/wiki/Poimandres (retrieved 13 June 2013)
[532] Lowell 1897a, *op. cit.*
[533] Liddell & Scott, *op. cit.*
[534] Encyclopaedia Britannica, *op. cit.*
[535] Lewis & Short, *op. cit.*
[536] Morrison, *op. cit.*
[537] en.wikipedia.org/wiki/Pourquoi-Pas_(1908) (retrieved 12 June 2012)
[538] Morrison, *op. cit.*
[539] en.wikipedia.org/wiki/Bo_Ya (retrieved 13 June 2013)
[540] Encyclopaedia Britannica, *op. cit.*
[541] Lewis & Short, *op. cit.*
[542] Lowell 1897a, *op. cit.*
[543] Autenrieth, *op. cit.*
[544] Encyclopaedia Britannica, *op. cit.*
[545] Lowell 1897a, *op. cit.*
[546] Liddell & Scott, *op. cit.*
[547] Lowell 1897b, *op. cit.*

[548] Liddell & Scott, *op. cit.*
[549] Lowell 1897a, *op. cit.*
[550] Liddell & Scott, *op. cit.*
[551] Lowell 1897b, *op. cit.*
[552] Liddell & Scott, *op. cit.*
[553] Lowell 1897a, *op. cit.*
[554] Liddell & Scott, *op. cit.*
[555] Encyclopaedia Britannica, *op. cit.*
[556] *Ibid.*
[557] *Ibid.*
[558] en.wikipedia.org/wiki/Alexander_Pushkin (retrieved 12 June 2012)
[559] Tsao, Jung Ying 1993, *The Paintings of Xugu and Qi Baishi*, ed. C. A. Bardoff (Far East Fine Arts)
[560] en.wikipedia.org/wiki/Qi_Baishi (retrieved 12 June 2012)
[561] Encyclopaedia Britannica, *op. cit.*
[562] Collier 1993, *Collier's Encyclopedia* (New York: P. F. Collier)
[563] en.wikipedia.org/wiki/Sergei_Rachmaninoff (retrieved 12 June 2012)
[564] Turne, *op. cit.*
[565] en.wikipedia.org/wiki/Raden_Saleh (retrieved 12 June 2012)
[566] Herdeck, D. E. *African Authors: A Companion to Black African Writing*, vol. 1: 1300–1973 (Washington, D. C.: Black Orpheus Press)
[567] en.wikipedia.org/wiki/Leetile_Disang_Raditladi (retrieved 12 June 2012)
[568] Encyclopaedia Britannica, *op. cit.*
[569] *Ibid.*
[570] *Ibid.*
[571] *Ibid.*
[572] Merriam, *op. cit.*
[573] Encyclopaedia Britannica, *op. cit.*
[574] *Ibid.*
[575] en.wikipedia.org/wiki/Ilya_Repin (retrieved 12 June 2012)
[576] Encyclopaedia Britannica, *op. cit.*
[577] *Ibid.*
[578] *Ibid.*
[579] *Ibid.*
[580] *Ibid.*
[581] *Ibid.*
[582] *Ibid.*
[583] en.wikipedia.org/wiki/Andrei_Rublev (retrieved 12 June 2012)
[584] Encyclopaedia Britannica, *op. cit.*
[585] en.wikipedia.org/wiki/Rudaki (retrieved 12 June 2012)
[586] Encyclopaedia Britannica, *op. cit.*

[587] Encyclopaedia Britannica, *op. cit.*
[588] en.wikipedia.org/wiki/Rumi (retrieved 13 June 2012)
[589] Prokhorov, *op. cit.*
[590] en.wikipedia.org/wiki/Shota_Rustaveli (retrieved 12 June 2012)
[591] Encyclopaedia Britannica, *op. cit.*
[592] en.wikipedia.org/wiki/Saadi_(poet) (retrieved 13 June 2012)
[593] Encyclopaedia Britannica, *op. cit.*
[594] en.wikipedia.org/wiki/Ihara_Saikaku (retrieved 13 June 2012)
[595] Encyclopaedia Britannica, *op. cit.*
[596] *Ibid.*
[597] Lowell 1897b, *op. cit.*
[598] Cox, George W. 2004, *The Mythology of the Aryan Nations*, Part Two (Whitefish, Montana: Kessinger Publishing)
[599] Lowell 1897a, *op. cit.*
[600] Cox, *op. cit.*
[601] Encyclopaedia Britannica, *op. cit.*
[602] *Ibid.*
[603] en.wikipedia.org/wiki/Sayat-Nova (retrieved 13 June 2012)
[604] Encyclopaedia Britannica, *op. cit.*
[605] Morrison, *op. cit.*
[606] Beech, Martin 2007, 'Schiaparelli, Giovanni Virginio' in *Biographical Encyclopedia of Astronomers* ed. Hockey, T. Hockey, V. Trimble & T. R. Williams (New York: Springer)
[607] Encyclopaedia Britannica, *op. cit.*
[608] *Ibid.*
[609] *Ibid.*
[610] Lewis & Short, *op. cit.*
[611] Encyclopaedia Britannica, *op. cit.*
[612] en.wikipedia.org/wiki/Sei_Shōnagon (retrieved 13 June 2012)
[613] Lowell 1897a, *op. cit.*
[614] Lewis & Short, *op. cit.*
[615] Lowell 1897b, *op. cit.*
[616] Lewis & Short, *op. cit.*
[617] Merriam, *op. cit.*
[618] Encyclopaedia Britannica, *op. cit.*
[619] *Ibid.*
[620] Gaze, *op. cit.*
[621] en.wikipedia.org/wiki/Amrita_Sher-Gil (retrieved 13 June 2012)
[622] Encyclopaedia Britannica, *op. cit.*
[623] en.wikipedia.org/wiki/Taras_Shevchenko (retrieved 13 June 2012)
[624] Encyclopaedia Britannica, *op. cit.*

[625] en.wikipedia.org/wiki/Sholem_Aleichem (retrieved 13 June 2012)
[626] Encyclopaedia Britannica, *op. cit.*
[627] *Ibid.*
[628] en.wikipedia.org/wiki/Simeiz (retrieved 13 June 2012)
[629] Encyclopaedia Britannica, *op. cit.*
[630] Lewis & Short, *op. cit.*
[631] Encyclopaedia Britannica, *op. cit.*
[632] en.wikipedia.org/wiki/Mimar_Sinan (retrieved 13 June 2012)
[633] International Astronomical Union, *op. cit.*
[634] Lewis & Short, *op. cit.*
[635] Lowell 1897a, *op. cit.*
[636] de.wikipedia.org/wiki/Tabula_Smaragdina (retrieved 13 June 2012)
[637] Encyclopaedia Britannica, *op. cit.*
[638] *Ibid.*
[639] Morrison, *op. cit.*
[640] en.wikipedia.org/wiki/Sobek (retrieved 13 June 2012)
[641] Lowell 1897a, *op. cit.*
[642] Liddell & Scott, *op. cit.*
[643] International Astronomical Union, *op. cit.*
[644] Lewis & Short, *op. cit.*
[645] International Astronomical Union, *op. cit.*
[646] Lewis & Short, *op. cit.*
[647] International Astronomical Union, *op. cit.*
[648] Lewis & Short, *op. cit.*
[649] International Astronomical Union, *op. cit.*
[650] Lewis & Short, *op. cit.*
[651] International Astronomical Union, *op. cit.*
[652] Lewis & Short, *op. cit.*
[653] International Astronomical Union, *op. cit.*
[654] Liddell & Scott, *op. cit.*
[655] Antoniadi, *op. cit.*
[656] Lewis & Short, *op. cit.*
[657] International Astronomical Union, *op. cit.*
[658] Lewis & Short, *op. cit.*
[659] International Astronomical Union, *op. cit.*
[660] Lewis & Short, *op. cit.*
[661] International Astronomical Union, *op. cit.*
[662] Lewis & Short, *op. cit.*
[663] International Astronomical Union, *op. cit.*
[664] Lewis & Short, *op. cit.*
[665] Antoniadi, *op. cit.*
[666] Lewis & Short, *op. cit.*
[667] International Astronomical Union, *op. cit.*
[668] Lewis & Short, *op. cit.*

[669] International Astronomical Union, *op. cit.*
[670] Lewis & Short, *op. cit.*
[671] Antoniadi, *op. cit.*
[672] Lewis & Short, *op. cit.*
[673] International Astronomical Union, *op. cit.*
[674] Lewis & Short, *op. cit.*
[675] International Astronomical Union, *op. cit.*
[676] Lewis & Short, *op. cit.*
[677] International Astronomical Union, *op. cit.*
[678] Lewis & Short, *op. cit.*
[679] Antoniadi, *op. cit.*
[680] Lewis & Short, *op. cit.*
[681] International Astronomical Union, *op. cit.*
[682] Lewis & Short, *op. cit.*
[683] International Astronomical Union, *op. cit.*
[684] Lewis & Short, *op. cit.*
[685] International Astronomical Union, *op. cit.*
[686] Lewis & Short, *op. cit.*
[687] Lowell 1897b, *op. cit.*
[688] Lewis & Short, *op. cit.*
[689] Lowell 1897a, *op. cit.*
[690] Lewis & Short, *op. cit.* s
[691] Encyclopaedia Britannica, *op. cit.*
[692] Lewis & Short, *op. cit.*
[693] Morrison, *op. cit.*
[694] es.wikipedia.org/wiki/Sor_Juana_Inés_de_la_Cruz (retrieved 13 June 2012)
[695] Encyclopaedia Britannica, *op. cit.*
[696] en.wikipedia.org/wiki/Natsume_Sōseki (retrieved 13 June 2012)
[697] Encyclopaedia Britannica, *op. cit.*
[698] en.wikipedia.org/wiki/Tawaraya_S=otatsu (retrieved 13 June 2012)
[699] Merriam, *op. cit.*
[700] Encyclopaedia Britannica, *op. cit.*
[701] Merriam, *op. cit.*
[702] *Ibid.*
[703] *Ibid.*
[704] Encyclopaedia Britannica, *op. cit.*
[705] en.wikipedia.org/wiki/Igor_Stravinsky (retrieved 13 June 2012)
[706] Encyclopaedia Britannica, *op. cit.*
[707] Morrison, *op. cit.*
[708] discover-jp.blogspot.com.es/2006/08/8-planeets-in-solar-system.html (retrieved 13 June 2012)
[709] Encyclopaedia Britannica, *op. cit.*
[710] *Ibid.*
[711] en.wikipedia.org/wiki/Surdas (retrieved 13 June 2012)

[712] Morrison, *op. cit.*
[713] en.wikipedia.org/wiki/Vasily_Surikov
(retrieved 13 June 2012)
[714] Gaze, *op. cit.*
[715] is.wikipedia.org/wiki/Júliana_Sveinsdóttir
(retrieved 13 June 2012)
[716] Encyclopaedia Britannica, *op. cit.*
[717] en.wikipedia.org/wiki/Fujiwara_Takanobu
(retrieved 13 June 2012)
[718] Morrison, *op. cit.*
[719] en.wikipedia.org/wiki/File:Genji_emaki_Yadorigi.JPG
(retrieved 13 June 2012)
[720] Lowell 1897a, *op. cit.*
[721] Lewis & Short, *op. cit.*
[722] Lowell 1897b, *op. cit.*
[723] Lewis & Short, *op. cit.*
[724] Morrison, *op. cit.*
[725] en.wikipedia.org/wiki/Tansen
(retrieved 13 June 2012)
[726] Lowell 1897b, *op. cit.*
[727] Lewis & Short, *op. cit.*
[728] Lowell 1897a, *op. cit.*
[729] Lewis & Short, *op. cit.*
[730] Morrison, *op. cit.*
[731] en.wikipedia.org/wiki/Rabindranath_Tagore
(retrieved 13 June 2012)
[732] Encyclopaedia Britannica, *op. cit.*
[733] Lewis & Short, *op. cit.*
[734] Encyclopaedia Britannica, *op. cit.*
[735] Lowell 1897a, *op. cit.*
[736] Lewis & Short, *op. cit.*
[737] Encyclopaedia Britannica, *op. cit.*
[738] Morrison, *op. cit.*
[739] Heydari-Malayeri, M. *An Etymological Dicioanry of Astronomy and Astrophysics: English–French–Persian*
aramis2obspm.fr/ heydari/dictionary/index.php
(retrieved 17 June 2012)
[740] Encyclopaedia Britannica, *op. cit.*
[741] *Ibid.*
[742] en.wikipedia.org/wiki/Leo_Tolstoy
(retrieved 14 June 2012)
[743] Turne, *op. cit.*
[744] `www.geringarart.com/bios/van.html`
(retrieved 14 June 2012)
[745] International Astronomical Union, *op. cit.*
[746] Pausanias, *op. cit.*, VIII, xvi
[747] Lowell 1897a, *op. cit.*
[748] Liddell & Scott, *op. cit.*
[749] Lowell 1897a, *op. cit.*

[750] Lewis & Short, *op. cit.*
[751] Lowell 1897a, *op. cit.*
[752] Lewis & Short, *op. cit.*
[753] Lowell 1897a, *op. cit.*
[754] Lewis & Short, *op. cit.*n
[755] Lowell 1897b, *op. cit.*
[756] Lewis & Short, *op. cit.*
[757] Morrison, *op. cit.*
[758] en.wikipedia.org/wiki/Cai_Wenji (retrieved 14 June 2012)
[759] Encyclopaedia Britannica, *op. cit.*
[760] en.wikipedia.org/wiki/Cao_Zhan (retrieved 14 June 2012)
[761] Morrison, *op. cit.*
[762] en.wikipedia.org/wiki/Ki_no_Tsurayuki (retrieved 14 June 2012)
[763] Morrison, *op. cit.*
[764] en.wikipedia.org/wiki/Dong_Yuan (retrieved 14 June 2012)
[765] Morrison, *op. cit.*
[766] en.wikipedia.org/wiki/Ivan_Turgenev (retrieved 14 June 2012)
[767] Lowell 1897a, *op. cit.*
[768] en.wikipedia.org/wiki/Turms (retrieved 14 June 2012)
[769] Encyclopaedia Britannica, *op. cit.*
[770] en.wikipedia.org/wiki/Tyagaraja (retrieved 14 June 2012)
[771] Encyclopaedia Britannica, *op. cit.*
[772] en.wikipedia.org/wiki/Unkei (retrieved 14 June 2012)
[773] Morrison, *op. cit.*
[774] en.wikipedia.org/wiki/Ustad_Isa (retrieved 14 June 2012)
[775] Morrison, *op. cit.*
[776] en.wikipedia.org/wiki/Valmiki (retrieved 14 June 2012)
[777] Encyclopaedia Britannica, *op. cit.*
[778] *Ibid.*
[779] *Ibid.*
[780] Lowell 1897a, *op. cit.*
[781] en.wikipedia.org/wiki/Vayu (retrieved 14 June 2012)
[782] Encyclopaedia Britannica, *op. cit.*
[783] *Ibid.*
[784] *Ibid.*
[785] Morrison, *op. cit.*
[786] pt.wikipedia.org/wiki/Gil_Vincente (retrieved 14 June 2012)
[787] Encyclopaedia Britannica, *op. cit.*

[788] Encyclopaedia Britannica, *op. cit.*
[789] *Ibid.*
[790] en.wikipedia.org/wiki/Vostok (retrieved 14 June 2012)
[791] Encyclopaedia Britannica, *op. cit.*
[792] en.wikipedia.org/wiki/Vyasa (retrieved 14 June 2012)
[793] Encyclopaedia Britannica, *op. cit.*
[794] *Ibid.*
[795] en.wikipedia.org/wiki/Wang_Meng_(artist) (retrieved 14 June 2012)
[796] Merriam, *op. cit.*
[797] Encyclopaedia Britannica, *op. cit.*
[798] *Ibid.*
[799] *Ibid.*
[800] Turne, *op. cit.*
[801] arts.cultural-china.com/en/77Arts6656.html (retrieved 14 June 2012)
[802] Morrison, *op. cit.*
[803] en.wikipedia.org/wiki/Postnik_Yakovlev (retrieved 14 June 2012)
[804] Encyclopaedia Britannica, *op. cit.*
[805] *Ibid.*
[806] de.wikipedia.org/wiki/Yun_Seon-do (retrieved 14 June 2012)
[807] Encyclopaedia Britannica, *op. cit.*
[808] en.wikipedia.org/wiki/Zarya_(polar_ship) (retrieved 14 June 2012)
[809] Encyclopaedia Britannica, *op. cit.*
[810] en.wikipedia.org/wiki/Zeami_Motokiyo (retrieved 14 June 2012)
[811] Encyclopaedia Britannica, *op. cit.*
[812] *Ibid.*
[813] Lowell 1897a, *op. cit.*
[814] Hesiod, *Hymn to Hermes*, l. 50
[815] Merriam, *op. cit.*
[816] Harvey, Sir Paul (ed.) 1967, *The Oxford Companion to English Literature*, 4th edn (Oxford: Clarendon Press)
[817] Riggs, *op. cit.*
[818] Encyclopaedia Britannica, *op. cit.*
[819] en.wikipedia.org/wiki/Antoni_Gaudí
[820] Merriam, *op. cit.*
[821] en.wikipedia.org/wiki/Wassily_Kandinsky
[822] Encyclopaedia Britannica, *op. cit.*
[823] Rose Benét, William (ed.) 1974, *The Reader's Encyclopedia* (London: Book Club Associates)
[824] Merriam, *op. cit.*
[825] en.wikipedia.org/wiki/Sergei_Prokofiev/
[826] Merriam, *op. cit.*
[827] Harvey, *op. cit.*

[828] Gaze, *op. cit.*
[829] en.wikipedia.org/wiki/Nína_Tryggvadóttir
[830] Encyclopeadia Britannica, *op. cit.*
[831] en.wikipedia.org/wiki/Qiu_Ying
[832] Merriam,, *op. cit.*
[833] en.wikipedia.org/wiki/Eiji_Yoshikawa
[834] Oxford University Press 1968, Oxford Classical Dictionary (London: Oxford University Press)
[835] en.wikipedia.org/wiki/Catullus (retrieved 30 December 2012)
[836] Merriam, op. cit.]
[837] en.wikipedia.org/wiki/Walt_Disney (retrieved 30 December 2012)
[838] Merriam, op. cit.
[839] en.wikipedia.org/wiki/Edward_Hopper (retrieved 30 December 2012)
[840] Merriam, op. cit.
[841] en.wikipedia.org/wiki/Scott_Joplin
[842] Gaze, op. cit.
[843] pl.wikipedia.org/wiki/Katarzyna_Kobro (retrieved 30 December 2012)
[844] Jenkins, T. S. 2004, Free Jazz and Free Improvisation: An Encyclopedia, vol. 2 (Westport: Greenwood)
[845] en.wikipedia.org/wiki/Krzysztof_Komeda (retrieved 30 December 2012)
[846] Turne, op. cit.
[847] en.wikipedia.org/wiki/Kawanabe_Kyōsai (retrieved 30 December 2012)
[848] Gaze, op. cit.
[849] en.wikipedia.org/wiki/Lyubov_Popova (retrieved 30 December 2012)
[850] Merriam, op. cit.
[851] en.wikipedia.org/wiki/Muddy_Waters (retrieved 30 December 2012)

Classified Index

[1] Lowell, Percival 1897a, 'New observations of the planet Mercury', *Mem. Amer. Acad. Arts & Sci.*, **12**, 433–466
[2] Lowell, Percival 1897b, 'Mercury', *Popular Astron.*, **4**, 360–363

Appendix 1: IAU Mercurian Nomenclature

[1] Blaauw, Adriaan 1994, *History of the IAU: The Birth and First Half-Century of the International Astronomical Union* (Dordrecht: Kluwer), pp. 2–6
[2] Lowell, P. 1897, 'Drawings of Mercury', *Astron. Nachr.*, **142**, 365–68
[3] Lowell, P. 1897, 'Mercury', *Astron. Nachr.*, **143**, 141–43
[4] Lowell, P. 1897, 'Mercury', *Popular Astron.*, 4, pages 360–63
[5] Payne, W. W. 1899, 'The planet Mercury', *Popular Astron.*, **7**, 471
[6] Antoniadi, E. M. 1974, *The Planet Mercury*, transl. Patrick Moore (Shaldon: Keith Reid)
[7] `astrogeology.usgs.gov/HotTopics/index.php?/categories/26-Planetary-Nomenclature` (retrieved 2013 August 29)

Appendix 3: Mercury Data

[1] 'Mercury Fact Sheet'
http://nssdc.gsfc.nasa.gov/planetary/factsheet/mercuryfact.html
(retrieved 17 July 2011)

Appendix 4: Mercury Transits

[1] Espinak, Fred 2011, *Seven Century Catalog of Mercury Transits: 1601 CE to 2300 CE*
http://eclipse.gsfc.nasa.gov/transit/catalog/MercuryCatalog.html
(retrieved 4 August 2011)
[2] McNally, D. 1974, *Positional Astronomy* (Bristol: Muller Educational), pp. 248–60
[3] Meeus, Jean 1989, *Transits* (Richmond: Willman-Bell)
[4] Espinak, *op. cit.*
(retrieved 4 August 2011)

Appendix 5: Mercury Timeline

[1] Neugebauer, O. 1969, *The Exact Sciences in Antiquity* (New York: Dover Publications), p. 101
[2] Thurston, Hugh 1994, *Early Astronomy* (New York: Springer), pp. 65–66
[3] Krupp, E. C. 1979, 'Astronomers, pyramids and priests' in *In Search of Ancient Astronomies*, ed. E. C. Krupp (London: Chatto & Windus), p. 198
[4] Antoniadi, E. M. 1974, *The Planet Mercury*, transl. Patrick Moore (Shaldon: Keith Reid), p. 10
[5] Plato, B.C. , *Republic*, X, 14
[6] Aristotle, *On the Heavens*, II, XIII
[7] Heath, Thomas L. 1932, *Greek Astronomy* (London: J. M. Dent), p. xxviii
[8] Pedersen, Olaf 1974, *Acta Historica Scientiarum Naturalium et Medicinalium*, vol. 30, *A Survey of the Almagest* (Odense University Press), p. 310
[9] *Ibid.*
[10] *Ibid.*
[11] *Ibid.*
[12] *Ibid.*
[13] *Ibid.*
[14] *Ibid.*
[15] Cicero, *De re publica*, VI (*Somnium Scipionis*), ix
[16] Vitruvius Pollio, Marcus, *De architectura*, X, i. 6
[17] Pedersen, *op. cit.*
[18] *Ibid.*

[19] Pederson, *op. cit.*
[20] *Ibid.*
[21] *Ibid.*
[22] *Ibid.*
[23] *Ibid.*
[24] *Ibid.*
[25] Theon of Smyrna *c.* A.D. 140, *On Mathematics Useful for the Understanding of Plato*, III, xxxvii
Transl. R. & D. Lawlor (1979)
www.scribd.com/neoplatonist/d/95089730-Mathematics-Useful-for-Understanding- Plato-Theon-of-Smyrna
(retrieved 14 June 2012)
[26] Pedersen, *op. cit.*
[27] Toomer, G. J. (ed.), *Ptolemy's Almagest* (London: Duckworth)
[28] Julian the Apostate, *Oration upon the Sovereign Sun. Addressed to Sallust*
www.tertulian.org/fathers/julian_apostate_1_sun.htm
(retrieved 19 June 2012)
[29] Capella, Martianus 410–429, *De nuptis Philologiae et Mercurii* (also known as *De septem disciplinis*, VIII
[30] Samsó, Julio , 'Bitrūjī: Nūr al-D¯ i n Abū Isḥāq', in *Biographical Encyclopedia of Astronomers*, vol. 1, ed. Thomas Hockey (New York: Springer), page 133
[31] Copernicus, Nicolaus 1543, *De revolutionibus orbium coelestium* (Nürnberg: Johannes Petreius)
[32] Kepler, Johannes 1629, *Admonitio ad astronomos, rerumque coelestium studiosos, De raris mirisque Anni 1631: Phaenomenis, veneris puta et mercurii in Solem incursu*, Johannes Kepler: Gesammelte Werke, Band XI
[33] Grant, Robert 1852, *History of Physical Astronomy from the Earliest Ages to the Middle of the Nineteenth Century* (London: Robert Baldwin), pp. 415–416
[34] Sandner, Werner 1963, *The Planet Mercury* (London: Faber & Faber), p. 21
[35] Hevelius, Johannes 1647, *Selenographia sive Lunae descriptio* (Danzig) [Facsimile, Edition Leipzig, Leipzig, 1967], page 75
[36] Antoniadi, *op. cit.*, p. 19
[37] *Ibid.*, p. 20
[38] *Ibid.*, p. 58
[39] Lalande, Joseph 1771–81, *Traité d'astronomie*, vol. II, 2nd edn (Paris), 656
[40] Antoniadi, *op. cit.*, p. 58
[41] Mem. Astron. Soc., 6, 116
[42] Antoniadi, *op. cit.*, p. 15
[43] Grant, *op. cit.*, p. 233,
[44] *Ibid.*
[45] Antoniadi, *op. cit.*, p. 58
[46] Bessel, F. W. 1832, 'Durchgang des Mercurs durch die Sonne', *Astron. Nachr.*, **10**, 185
[47] *Ibid.*
[48] Dawes, W. R. 1848, *Mon. Not. R. Astron. Soc.*, **9**, 21
[49] Antoniadi, *op. cit.*, p. 28

[50] *Ibid.*, p. 25
[51] *Ibid.*
[52] *Ibid.*, p. 20
[53] Vogel, Hermann Carl 1874, *Untersuchungen über die Spektra der Planeten* (Leipzig), p. 90
[54] Young, Charles A. 1888, *A Text-book of General Astronomy for Colleges and Scientific Schools* (Boston: Ginn), p. 326
[55] Francis, P. 1981, *The Planets: A Decade of Discovery* (Harmondsworth: Penguin), p. 147
[56] Schiaparelli, G. V. 1889, 'Sulla rotazione di Mercurio', *Astron. Nachr.*, **123**, 241–250
[57] Denning 1887–88, *J. Liverpool Astron. Soc.*, **6**, 118
[58] Schiaparelli, *op. cit.*, p. 241
[59] Müller, G. 1893, 'Ueber die Lichtstärke des Planeten Mercur', *Astron. Nachr.*, **133**, 47–52
[60] Lowell, Percival 1897a, 'New observations of the planet Mercury', *Mem. Amer. Acad. Arts & Sci.*, **12**, 433–466
[61] Lowell, Percival 1897b, 'Mercury', *Popular Astron.*, **4**, 360–363
[62] Barnard, Edward E. 'On the dimensions of the planets and satellites', *Astron. Nachr.*, **157**, 261–68
[63] Danjon, A. 1924, 'Observations de Mercure', *L'Astronomie*, **38**, 89–93
[64] Einstein, A. 1915, 'Erklarung der Perihelionbewegung der Merkur aus der allgemeinen Relativitatstheorie', *Sitzungsber. preuss. Akad. Wiss.*, textbf47, 831–39
[65] Lyot, M. 1930, *Comptes Rendus*, 27 Oct 1930, 703
[66] Adams, Walter S. & Dunham, Jr, Theodore 1932, 'Note on the spectrum of Mercury', *Publ. Astron. Soc. Pacific*, **44**, 380
[67] Slipher, V. M. 1933, 'Spectrographic studies of the planets', *Mon. Not. R. Astron. Soc.*, **93**, 657–67
[68] Antoniadi, E. M. 1934,*La Planète Mercure* (Paris: Gauthier–Villars)
[69] Pettengill, G. H. & Dyce, R. B. 1965, 'A radar determination of the rotation of the planet Mercury', *Nature*, **206**, 1240
[70] Shapiro, Irwin I. 1964, 'Fourth test of general relativity', *Phys. Rev. Lett.*, **13**, 789–91
[71] Colombo, G. 1965, 'Rotational period of the planet Mercury', *Nature*, **208**, 575
[72] Dunne, James A. & Burgess, Eric 1978, *The Voyage of Mariner 10: Mission to Venus and Mercury* (NASA: SP-424)
[73] *Ibid.*
[74] *Ibid.*
[75] *Ibid.*
[76] Murray, B. C., Strom, R. G., Trask, N. J. & Gault, E. E. 1975, 'Surface history of Mercury: Implications for terrestrial planets', *J. Geophys. Res.*, **80**, 2508–14
[77] Ness, N. F., Behannon, K, W., Lepping, R. P. & Whang, Y. C. 1976, 'Observations of Mercury's Magnetic Field', *Icarus*, **28**, 479–88 Davies, Merton E., Dwornik, Stephen E., Gault, Donald E. & Strom, Robert G. 1978, *Atlas of Mercury* (NASA SP-423)

[78] messenger.jhuapl.edu/the_mission/MESSENGERTimeline/EarthLaunch.thml
[79] messenger.jhuapl.edu/mer_flyby1.html
[80] messenger.jhuapl.edu/news_room/telecon3.html
[81] *Ibid.*
[82] *Ibid.*
[83] *Ibid.*
[84] *Ibid.*
[85] messenger.jhuapl.edu/mer_flyby2.html
[86] messenger.jhuapl.edu/news_room/press06.html
[87] *Ibid.*
[88] *Ibid.*
[89] *Ibid.*
[90] *Ibid.*
[91] messenger.jhuapl.edu/mer_flyby3.html
[92] messenger.jhuapl.edu/news_room/press_release110309.html
[93] *Ibid.*
[94] *Ibid.*
[95] messenger.jhuapl.edu/the_mission/MESSEENGERTimeline/MercuryOrbitInsertion.html