

# **Sun, moon, and stars**

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## ABSTRACT

The purpose of this paper is to serve as a checklist and pictorial guide for several natural phenomena having to do with the sun, moon, and stars, including sunrises and sunsets (and the related compass points), phases of the moon (and the related tides), eclipses, and constellations (technically asterisms). Sunlight and moonlight can also be reflected, diffracted and refracted, resulting in various phenomena that include not only rainbows but also sun dogs, halos, and arcs.

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## VERSION HISTORY

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# Sun, moon, and stars

by David Mead and Daniel Vermonden

The purpose of this paper is to serve as a checklist and pictorial guide for several natural phenomena having to do with the sun, moon, and stars, including sunrises and sunsets (and the related compass points), phases of the moon (and the related tides), eclipses, and constellations (technically asterisms). Sunlight and moonlight can also be reflected, diffracted and refracted, resulting in various phenomena that include not only rainbows but also sun dogs, halos, and arcs.

One of the things that first piqued my (David's) interest in this topic was a paper by Robert Blust, wherein he hypothesized that words for certain phenomena discussed herein—including shadows, rainbows, sunshowers, and sun dogs—belonged to a semantic category of experiences that had a dangerous connection to the spirit world, marked historically with the \*qali/\*kali- prefix (Blust 2001). In our research we should be alert to lingering spiritual or animistic overtones associated with certain of the phenomena discussed herein.

The intersection of two passions—for sailing and anthropological research—led me (Daniel) one summer to join the crew of a traditional Butonese trading sloop on their three-week return journey from Java. Later I returned to Buton Island and settled in Bahari village for an extended period of ethnographic fieldwork focused on their seafaring and fishing activities. Novice that I was, I spent many an evening with Cia-Cia friends as they shared their knowledge of the night sky and told me stories about the stars.

## Shadow and reflection

A **shadow** is caused by a body or object coming between rays of light and a surface. The Indonesian term for shadow is *bayang-bayang* or simply *bayangan*, but be careful as both terms can also refer to reflections (see below) or even phantoms.



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The opposite of a shadow, so to speak, is **filtered sunlight**, *cahaya matahari yang tersaring lapisan daun-daun pohon*, also called dappled sunlight or dapples of sunlight, such as might be seen on the ground under a forest canopy.



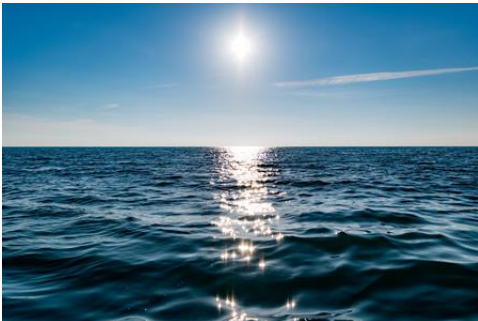
Public Domain (Pixabay).

A **reflection** is produced when light rays bounce off of a reflecting surface. When the reflecting surface is flat and smooth, the result will be a mirror image (*pantulan cermin*). In Indonesian reflections can be referred to as *refleksi*, *bayang-bayang* or *bayangan*.



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There may be a particular term for the way sunlight or moonlight reflects off of rippled or choppy water. In English it is called **sun glitter** or **moon glitter**; in Indonesian it can be referred to as *refleksi sinar matahari atau bulan di air berombak*. If the water were perfectly calm, the sun's reflection would be a circle.

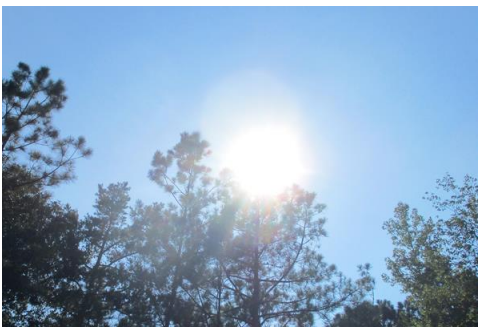


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**Glare** is strong or dazzling light, *cahaya yang menyilaukan*. Glare may emanate directly from the sun or a bright light, or be reflected off of a surface.

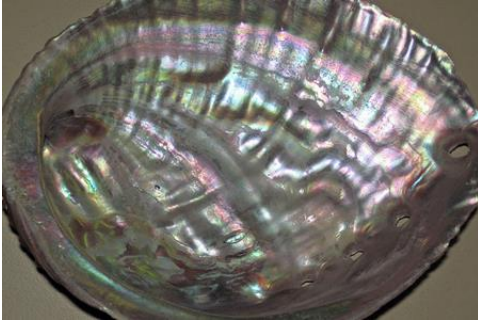


Sun glare. © 2017 by David Mead. Released to the Public Domain.

**Iridescence** refers to a lustrous play of rainbow-like colors that change with the angle at which something is viewed or illuminated. Iridescence is famously seen in oil slicks and soap bubbles, but it can also be observed in certain other objects such as sea shells, fish scales, feathers, insect wings, and minerals. We don't know a specific Indonesian term for iridescence, but it could perhaps be described as *pantulan cahaya yang berwarna-warni seperti pelangi*.



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Disk abalone (*Haliotis discus*). © 2016 by James St. John. CC BY 2.0 Generic.

## Sun, rain, and clouds

A **rainbow**, *pelangi*, is formed when sunlight is refracted (bent) as it both enters and exits water droplets.



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In parts of Indonesia the rainbow is considered to predict the weather. There may be some meteorological basis for this, e.g. a partial rainbow predicting wind without rain, while a complete rainbow predicts rain with little wind (as among Bugis sailors, reported in Ammarell 1999:111). According to Kruyt, some languages of central Sulawesi have different words for morning rainbows versus afternoon rainbows. He also related several beliefs that people held about rainbows, including: a general prescription was to stop all agricultural work for the day once a rainbow appeared, morning or afternoon; a morning rainbow portended calamity; consequences were especially dire for the concerned place if the foot of a rainbow fell on a village, field, pasture, or corral; when people used to go on raids or went to war, a rainbow could be auspicious (predicting the enemy's death) or unfavorable (portending death among one's own party), depending on time and location of the rainbow; pointing at a rainbow (*menunjuk pelangi*) was prohibited, since this action was thought to bring ill to one's finger, arm, or body (Kruyt 1938, II:355–360).

In a **double rainbow** (Indonesian *pelangi ganda*), a fainter arc is seen outside the primary arc and has its colors reversed, that is, red on the inside.



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Less commonly, two rainbows will appear to originate from the same base, but divide higher up. This has two possible causes: ‘twinned rainbows’ (*pelangi kembar*) are produced when the sun’s rays pass through water droplets of two distinct sizes. In another case, one rainbow is produced by the sun’s direct rays, while a second ‘reflection rainbow’ (*pelangi pantulan*) is produced by the sun’s rays reflected off the surface of a lake or other large body of water.



Reflection rainbow over Skagit Bay, Whidbey Island, Washington, with sun setting and reflected behind camera from water of Dugualla Bay. © 2007 by Terry L Anderson. Released to the Public Domain.

In fact any type of airborne mist can create a rainbow, for example fine droplets rising from a waterfall (English ‘spray bow,’ Indonesian *pelangi air terjun*) or spray from a hose.



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A **moonbow** is formed by the same processes as rainbows, but created by moonlight instead of sunlight. It can be described in Indonesian as *pelangi bulan*, *pelangi yang terjadi pada malam hari setelah matahari telah terbenam*.



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Rainbow-like colors observed in cloud edges or in thin, semitransparent clouds near the sun or moon is called **cloud iridescence**. The scattering of colors is caused by small water droplets or small ice crystals that diffract light. During the day these ‘rainbow clouds’ or *awan pelangi* are easiest to observe when the sun itself is hidden, for example by a building or by another cloud; otherwise the iridescence may be lost in the sun’s glare.



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Cloud iridescence can take the striking form of a rainbow cap on top of cumulus clouds after a thunderstorm, the result of air that rapidly rises and cools, creating small water droplets. This phenomenon is sometimes referred to as a **fire rainbow** (Indonesian *pelangi api*, also *pelangi awan*). For another use of the term fire rainbow, see the discussion below concerning circumhorizontal arcs.



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A **sunshower** is rain that falls while the sun is shining. In Indonesian sunshowers are called *hujan panas*, literally ‘hot rain.’



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In the Uma area of Central Sulawesi “a sunshower is called *uda ncimaa'*, from the root *hima'* ‘to shine’ (as in *hima' eo* ‘the sun is shining’). There is a kind of demon called *to hima'* ‘the shining one,’ believed to cause people to get headaches; this demon wanders around during sunshowers” (Michael Martens 2014:pers.comm.). In the Kulisusu area of Buton Island, people believe getting caught in a sunshower can bring on sickness.

The term **silver lining** refers to a bright outline along the edge of a dark cloud, *bagian tepi awan hitam yang bersinar keperakan*. It results from sunlight being diffracted by droplets along the cloud’s outer edge.



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**Sunbeams**, also known as sun rays (Indonesian *pancaran matahari*, *pancaran cahaya sinar matahari*), are shafts of sunlit air against a darker background. They are produced when sunlight is filtered through gaps in clouds or other objects.



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Check whether the same term is used for individual shafts of sunlight that penetrate into a house or other shaded area (Indonesian *pancaran sinar matahari yang masuk rumah atau tempat naungan lain*).



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## Coronas, halos, and arcs

A **corona** (Indonesian *korona*, *mahkota matahari atau bulan*) around the sun or moon (and occasionally bright stars and planets) is produced when light is diffracted by tiny water droplets or sometimes ice crystals. It consists of a inner bright center (called the **aureole**)<sup>1</sup> and several concentric, pastel-colored rings. However, the luminous aureole shading off into reddish-brown may be the only visible part of the corona, especially in the case of the moon.

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<sup>1</sup> The term ‘aureole’ originally referred to a light or halo painted around the head of a deity or saint (the term goes back to Latin *aureola corona* ‘golden crown’), but by extension it refers to any luminous or colored ring that encircles something.



Lunar corona. © 2007 by Wing-chi Poon. CC BY-SA 2.5 Generic.

The English term ‘corona’ also refers to the aura of plasma that surrounds the sun—usually visible to the naked eye only during a total solar eclipse—but this is distinct from the optical phenomenon discussed here.

A **halo** is an optical phenomenon produced when sunlight or moonlight is reflected and refracted by ice crystals floating in the earth’s atmosphere. Depending on the shape and orientation of the ice crystals and how high the sun or moon is in the sky, halos can take on numerous forms. In this section we discuss only three of the most common ones: the circular halo, the circumhorizontal arc, and the circumzenithal arc.<sup>2</sup> We also mention the related sun dogs and, further below, light pillars. Sun dogs and light pillars are likewise produced by light interacting with ice crystals.

A **circular halo** around the sun or moon appears as a ring with faint rainbow-like colors, reddish on the inside and bluish on the outside. Circular halos are also called 22° halos, because they always occur at a fixed angular distance—roughly 22°—from the sun or moon. This distance is about the size of one’s outstretched hand held at arm’s length.



Lunar halo. © 2015 by Gladson Machado. CC BY-SA 4.0 International.

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<sup>2</sup> An account of the broad and diverse ‘ice crystal halo family’ lies beyond the scope of this paper. For the record, other members of this family include the 46° halo, Hevel’s halo, parhelic circles, upper tangent arcs, lower tangent arcs, supralateral arcs, infralateral arcs, subhelic arcs, Parry arcs, Tricker arcs, Wegener arcs, and diffuse arcs.



Solar halo. © 2012 by Tibes. CC BY 2.0 Generic.

Colloquially these halos are called moon rings or rings around the moon (for lunar halos) and sun rings or rings around the sun (for solar halos). The corresponding Indonesian terms are *halo bulan*, *bulan bercincin*, or *bulan bercincin pelangi* (for lunar halos), and *halo matahari*, *matahari bercincin*, or *matahari bercincin pelangi* (for solar halos).

According to weather lore in the West and perhaps other parts of the world, a halo around sun or moon predicts the advent of rain. In that ice crystals may form high in the atmosphere ahead of a front, there is some factual basis for this notion. In upland Central Sulawesi people likened a solar halo to the sun wearing a headband, *tali*, and interpreted it as an omen that a nobleman was going to die (Kruyt 1938, II:359, 375). In the Balantak area of eastern Sulawesi, people regarded a halo around the moon as a sign that a certain kind of fish, locally called *busukan*, would appear in large numbers (Kruyt 1932:363).

A **circumhorizontal arc** appears as a rainbow-like halo near the horizon (*kaki langit*, *ufuk*, *horison*)—specifically, at an angular distance of  $46^\circ$  degrees below the sun. Because of this, it is possible to see a circumhorizontal arc only when the sun is high in the sky (at least  $58^\circ$  above the horizon). The first picture below shows a circumhorizontal arc (near bottom of image) in relationship to a circular halo (at top of image).



22° halo (top) and circumhorizontal arc (bottom). © 2008 by Baccara at Wikimedia Commons. CC BY-SA 3.0 Unported.



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The technical Indonesian name for a circumhorizontal arc is *busur sirkumhorizontal*. Some Indonesian bloggers refer to circumhorizontal arcs as *pelangi terbalik* ‘upside-down rainbows,’ but this name is probably better applied to the circumzenithal arcs described below.

A circumhorizontal arc seen against a backdrop of wispy, fragmented clouds is sometimes called a **fire rainbow** (Indonesian *pelangi api*). A circumhorizontal arc can be distinguished from cloud iridescence (see above) in that a circumhorizontal arc is always located below the sun at an angle of  $46^\circ$  and the color is ordered with red on top and violet on the bottom.



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In contrast to circumhorizontal arcs, which are located  $46^\circ$  *below* the sun near the horizon, **circumzenithal arcs** (Indonesian *busur sirkumzenital*) are located high in the sky,  $46^\circ$  *above* the sun, and appear to form part (never more than a quarter) of a circle centered on the zenith (the point directly overhead, Indonesian *zenit*).



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Circumzenithal arcs are also called smiles in the sky, smile-in-the-sky rainbows, and upside-down rainbows (Indonesian *pelangi terbalik*). Although not an infrequent phenomenon, circumzenithal arcs may be overlooked because of their overhead position.

A **sun dog**, also called a sundog, mock sun, or parhelion,<sup>3</sup> is a bright spot to the side and at the same level as the sun above the horizon. Sun dogs usually occur in pairs at an angular distance of  $22^\circ$  to the left and right of the sun.<sup>4</sup> Sun dogs are brightest when the sun is close to the horizon, but they can be seen at other sun elevations as well. A line linking the sun and its mock suns—and sometimes continuing for  $360^\circ$  to make a complete circle—is called a parhelic circle. In Indonesian sun dogs can be called *matahari semu* or *matahari bayangan*.



Very bright sun dogs in Fargo, North Dakota. © 2009 by Gopherboy6956 at Wikimedia Commons. Released to the Public Domain.

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<sup>3</sup> Plural *parhelia*; from Greek *para* ‘beside’ and *helios* ‘sun.’

<sup>4</sup> Atmospheric conditions can produce sun dogs at other angular distances, which go by the names Hevelius’s  $90^\circ$  parhelia,  $120^\circ$  parhelia, and Liljequist parhelia. An anthelion is a bright spot appearing directly opposite the sun on the parhelic circle.



Sun dog visible to the left of the sun. © 2008 by Christine Tschuch. CC BY-SA 3.0 Unported.

Another light phenomenon—produced when solar winds affect the magnetosphere and precipitate charged particles into the upper atmosphere—are the **aurora** or polar lights. In the northern hemisphere they are known as the aurora borealis or northern lights; in the southern hemisphere they are known as the aurora australis or southern lights.



Released by the United States Air Force. Public Domain.

As the result of one of the largest recorded geomagnetic storms, in early September, 1859, auroras could be seen as far south as Colombia, South America,<sup>5</sup> but even this display probably did not reach Indonesia. In your lexicographical research you can ignore auroras.

## Antisolar phenomena

The three phenomena discussed in this section—solar glories, heiligenscheins, and water aureoles—are all centered on the antisolar point (or the antilunar point in the case of the moon). This point coincides with the shadow of the observer's head. However they are created by different processes.

A **solar glory** is an optical phenomenon that creates a rainbow-colored halo or concentric halos around the shadow of the viewer's head. In Indonesian it could be described as *lingkaran cahaya pelangi yang mengelilingi kepala bayangan si penonton*. It is observed when the viewer's shadow is cast upon mist or clouds, thus typically only when the viewer is on a tall building, up in the mountains, or in an airplane, with a cloud layer below. When the sun is low, the viewer's long shadow may in turn appear magnified, and is called a **Brocken**

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<sup>5</sup> Wikipedia The Free Encyclopedia, s.v. "Aurora" <https://en.wikipedia.org/wiki/Aurora> (accessed July 22, 2017).

**spectre** or mountain spectre (Indonesian *hantu brocken*, *bayang-bayang hantu gunung*). Less commonly a glory may be produced by moonlight, in this case called a lunar glory.



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A **heiligenschein** (German for ‘holy light’) is an optical phenomenon which creates a bright spot around the shadow of the viewer’s head. The best time to observe one’s own heiligenschein is early in the morning by facing away from the sun and allowing your shadow to fall on a grassy, dew-covered field. The individual dewdrops retroreflect the sunlight back the same direction it came from, creating an apparent bright spot around your shadow’s head. We do not know a specific Indonesian term for this phenomenon, but it could be described as *lingkaran cahaya yang kelihatan bersinar di sekitar bayangan kepala si pemirsa*.



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A **water aureole**, or aureole effect, is an optical phenomenon in which light and dark rays appear to radiate from the shadow of an observer’s head as they look down into rippling water. The effect is produced by waves which act as lenses to focus and defocus sunlight.



Aureole effect and California sea lion at San Fransisco Bay  
© 2010 by Brocken Inaglory via Wikimedia Commons. CC BY-SA 3.0 Unported.

## Sunrise and sunset phenomena

The best **sunrises** (*terbit matahari*) and **sunsets** (*terbenam matahari*) are known for their brilliant displays of color. Some languages of Sulawesi have a special word for a sunset that spreads a deep red color across the western sky, e.g. Kaili *langilei* ('red sky'), Napu *boburaa* (literally 'blood spewing forth'); such a sunset was regarded as a bad omen (Kruyt 1938, II:374).



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Here are some other phenomena associated with sunsets and sunrises.

A **light pillar**, also known as a sun pillar or solar pillar (Indonesian *tiang cahaya matahari*) appears as a column of light above the setting or rising sun. It is created by sunlight reflecting and refracting off of ice crystals high in the atmosphere. Light pillars thus belong to the same class of phenomena as the halos and arcs discussed above.



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Rarely a light pillar can be seen below the sun, in which case it is known as a subsun, sub-sun, or lower sun pillar. Light pillars can also form around the moon.

The term **green flash** (also green ray, Indonesian *kilatan hijau*) refers to a green spot that momentarily appears above the sun just before it sets or immediately after it rises. It is best observed when the air is clear, stable and layered, and the horizon is unobstructed. Under the best conditions a green flash may last two seconds; in the tropics it rarely lasts more than a second.



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The term **crepuscular rays** (from Latin *crepusculum* ‘twilight’) refers to sunbeams that appear to converge on the rising or setting sun.



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If you are lucky you may see the rays extending across the sky and converging on a point directly opposite the sun, known as the antisolar point. Rays that converge opposite the sun are known as **antisolar rays** or anticrepuscular rays. In actuality the sunbeams are parallel, but they appear to converge in the same way that the rails of a train track do.



Anticrepuscular rays. © 2011 by wojtow via Wikimedia Commons. CC BY-SA 3.0 Unported.

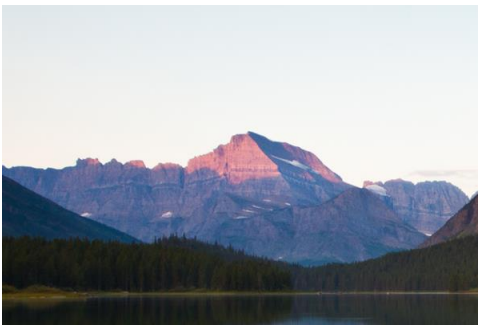
The **last light of day** refers to the period of time immediately before and after sunset, and corresponds well to Indonesian *petang hari*. The time of day commencing with sunset and ending at nightfall is known as **evening twilight**. Colloquially this period of time, or at least the darker part of it, is also known as **dusk** (Indonesian *menjelang malam*). When the sky is clear, several phenomena can be observed during evening twilight. In the western sky look for afterglow. In the eastern sky look for alpenglow, the belt of Venus, and earth’s shadow.

In popular usage, **afterglow** refers to any light seen in the sky after sunset, including brilliant colors reflected off of clouds. However in its more restricted sense, afterglow refers to light or radiance that remains in the *clear* sky (e.g. in a cloudless sky, or in the sky above or behind clouds) after sunset. Afterglow results from sunlight being scattered by dust and other fine particles floating in the atmosphere. Afterglow consists of two parts: a **bright segment** above the solar point (this bright segment is also called the twilight arch or crepuscular arch) topped with a faint band of **purple light** that covers much of the western sky.



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Even after the sun has set, we may turn and notice that mountains to our east are still bathed in sunlight. The sunlight, however, inches ever upward until even the peaks are enveloped in the earth's shadow. However they do not immediately go dark, but instead take on a rosy or purple glow—a reflection of afterglow from the mountains back toward us. This reflection is known as **alpenglow**. Some people also use the term alpenglow to refer to sun-bathed mountain peaks.



Mountain peak bathed in sunlight. © 2013 by Jeff P. at Flickr. CC BY 2.0 Generic.



Alpenglow. © 2012 by John Fowler. CC BY 2.0 Generic.

Even when the eastern horizon is flat, there are still things to be noticed during a clear evening twilight. Next to the horizon is a dark segment called the **earth's shadow** (Indonesian *bayangan bumi*). Above it is a layer of pink, orange, or purple sky, called the **antitwilight arch**, more quaintly known as the belt of Venus or Venus's girdle (Indonesian unknown).



Full moon seen in the belt of Venus; dark blue band along the horizon is the earth's shadow. Image courtesy of [flagstafffotos.com.au](http://flagstafffotos.com.au). CC BY-NC 3.0 Unported.

**Daybreak**, also break of day or crack of dawn, refers to the first appearance of light on the eastern horizon before sunrise. In Indonesian daybreak can be referred to as *fajar*, or specifically as *fajar sadik*. **Morning twilight** (Indonesian *subuh*) refers to the transition period between night and morning that ends when the disc of the sun appears on the horizon. Meteorologists equate dawn with daybreak, but colloquially dawn is also used for the entire transition period. or even for the appearance of the sun on the eastern horizon.



The eastern sky during the period of morning nautical twilight. Public Domain (Pixabay).

A technical distinction can be made between **morning nautical twilight** (a trace or band of light is visible on the eastern horizon, but it is still too dark to see clearly; sun is between twelve and six degrees below the horizon) and **morning civil twilight** (the sky is bright enough that most outdoor activities can be conducted without artificial light; sun is between six and zero degrees below the horizon). Corresponding terms indicate similar periods within evening twilight.<sup>6</sup>

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<sup>6</sup> See further: Wikipedia The Free Encyclopedia, s.v. "Twilight" <https://en.wikipedia.org/wiki/Twilight> (accessed August 1, 2017).

In Islam both morning twilight and evening twilight are designated as times for ritual prayer. Prayers said during morning twilight are known in Indonesian as *salat fajar* or *salat subuh*. Prayers said during evening twilight are known as *salat magrib*.

**Zodiacal light**, also known as false dawn, is caused by sunlight reflecting off of interplanetary dust in our solar system. It appears as a band or triangle of faint light extending upward from the horizon, usually at a slight angle (corresponding to the angle at which the sun rises or sets).



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Zodiacal light is best observed away from city lights on clear, moonless nights, either just after nightfall or just before daybreak. Zodiacal light was known to the prophet Mohammed, who referred to it as *al-fajr al-kādhīb* ‘false dawn’ (Indonesian *fajar kadzib*).

On the best viewing opportunities Zodiacal light extends as a band across the entire night sky, with a faint brightening in the band at the antisolar point (the point exactly opposite the sun in the sky). This faintly luminous oval is known as the  **gegenschein**  (from German *gegen* ‘opposite’ + *Schein* ‘shine’) (Indonesian unknown).



Gegenschein. Photo credit: European Southern Observatory (ESO) / Y. Beletsky. CC BY 4.0 International.

In distinction to a false dawn, a **false sunrise** (Indonesian *matahari terbit palsu*) is an optical phenomenon whereby the sun appears to have risen when it is actually still below the horizon. False sunrises can have various causes. In the image below, what appears to be the sun is actually a truncated sun pillar (see discussion above).



Public Domain (Wikimedia).

## Divisions of the solar day

Every language divides the cycle of day and night into periods, or makes use of certain reference points, so that one can specify when events have happened or are going to happen. For example out of ideas developed in ancient Egypt came the tradition of dividing the day into 24 equal periods, which we know as ‘hours’ (from Greek *hōra*). By convention each new day begins at midnight.

Across much of Indonesia people are familiar with dividing the solar day into periods based on Muslim prayer times: *fajar*, *zuhur* (or *lohor*), *asar*, *magrib* and *isya*. In this tradition each new day begins at sunset.

In the languages where we work we should be alert to how people divide the solar day. Some natural dividing points have already been mentioned: daybreak, sunrise, sunset, and nightfall, to which we might add the time at which the sun reaches its apex (Indonesian *puncak edaran*) in the noontime sky. Below are terms which the Kulisusu people of Buton Island, southeastern Sulawesi, use to divide up their day. Many of the daytime terms reference the position of the sun.

Kulisusu term	description
<i>ngkomeantano</i>	early hours of the morning before light, until about 5 am
<i>mewa-mewangu</i>	early morning prior to sunrise, morning twilight
<i>mewangu</i>	morning, after the sun has risen but the day has not yet turned hot
<i>entaa oleo</i>	midmorning, literally ‘the sun is tall’
<i>ntonga oleo</i>	midday
<i>todo oleo</i>	noon, noontime, literally ‘the sun is taut’
<i>telia oleo</i>	early afternoon, about 1 or 2 p.m. when the sun has passed its apex, literally ‘the sun has slipped’
<i>ompudu oleo</i>	late afternoon, literally ‘the sun is short’
<i>ngkiniwia</i>	evening, time around sunset

<i>malo</i>	night
<i>mata malo</i>	nighttime, after dark
<i>mentonga alo</i>	midnight, middle of the night
<i>lembahi alo</i>	wee hours of the night, from midnight until about 2 a.m., or 3 a.m. at the latest, literally ‘the night is late’

## Phases of the moon and moon days

From the perspective of an observer on earth, the moon rises and sets about fifty minutes later each day, and goes through phases. When the amount of illuminated surface is increasing from night to night, the moon is said to be waxing. During its waxing phase it passes from new moon to crescent moon (also increscent moon), first-quarter moon (also called half moon), gibbous moon, and finally full moon. The moon then enters its waning phase as it passes from full moon to gibbous moon, third-quarter moon, crescent moon (in its waning phase technically *decrescant* moon) and back to new moon. This cycle repeats every twenty-nine and a half days, completing a lunar month.



Image credit: Dan Morgan (<http://www.danmorgan.org>). Used with permission.

Similar distinctions are made in Indonesian. The first crescent moon is accorded special status since it marks the start of a new month according to the Muslim lunar calendar.

<i>bulan baru</i>	=	new moon
<i>bulan sabit pertama</i>	=	first crescent (increscent) moon
<i>bulan sabit muda</i>	=	waxing crescent (increscent) moon (visible in the evenings)
<i>bulan perbani awal</i>	=	first-quarter moon
<i>bulan cembung</i>	=	waxing gibbous moon
<i>bulan pernama</i>	=	full moon (visible all night long)
<i>bulan cembung</i>	=	waning gibbous moon

<i>bulan perbani akhir</i>	=	third-quarter moon
<i>bulan sabit tua</i>	=	decrecent moon (visible in the mornings)
<i>bulan baru</i>	=	new moon

A waxing moon can be referred to as a *bulan yang membesar*; a waning moon can be referred to as a *bulan yang mengecil*.

A number of languages of Sulawesi had names not just for the principal lunar phases described above, but for each moon day, up to twenty-nine or thirty different terms (see Appendix B). For example the following are the terms from Pamona recorded by Adriani and Kruyt (1912:265 ff.). Traditionally agricultural work was prohibited on certain days of the lunar month. This is also noted in the chart.

	Pamona term	meaning
1	<i>eo mbuya</i>	'day of the moon' first night on which a crescent moon can be seen at sunset; on the following day agricultural work was prohibited
2	<i>ka'isanya uayu</i> or <i>uyuenya</i>	'the first of the eight,' 'the beginner'
3	<i>karaduanya uayu</i>	'the second of the eight'
4	<i>katatogonya uayu</i>	'the third of the eight'
5	<i>ka'aoponya uayu</i>	'the fourth of the eight'
6	<i>ka'alimanya uayu</i>	'the fifth of the eight'
7	<i>ka'aononya uayu</i>	'the sixth of the eight'
8	<i>kapapitunya uayu</i>	'the seventh of the eight'
9	<i>kapusnya uayu</i>	'the end of the eight'
10	<i>wuya mbawu kodi</i>	'the small pig-moon'
11	<i>wuya mbawu bangke</i>	'the big pig-moon' (a prohibition day for agriculture)
12	<i>wuya tau kodi</i>	'the small person-moon' (a prohibition day for agriculture)
13	<i>wuya tau bangke</i>	'the big person-moon' (full moon)
14	<i>kakunia</i>	'yellowness' (the sun is already above the horizon when the moon sets)
15	<i>toginengeri</i>	'the one suffering from animals going back and forth' (a prohibition day for agriculture)
16	<i>pombarani</i>	'burner' (a prohibition day for agriculture)
17	<i>wani</i>	'obscure'

18	<i>karaduanya wani</i>	‘the second <i>wani</i> ’
19	<i>katatogonya wani</i>	‘the third <i>wani</i> ’
20	<i>kapusa mbani</i>	‘the last <i>wani</i> ’
21	<i>meronco</i>	‘pushed in’ (a prohibition day for agriculture except for widows and widowers)
22	<i>kawe</i>	‘beckon’ (a prohibition day for people who have children)
23	<i>karaduanya kawe</i>	‘the second <i>kawe</i> ’
24	<i>katatogonya kawe</i>	‘the third <i>kawe</i> ’
25	<i>kapusa ngkawe</i>	‘the last <i>kawe</i> ’
26	<i>tu'a marate</i>	‘the long stump’ (a prohibition day for agriculture)
27	<i>tu'a rede</i>	‘the short stump’
28	<i>poliunya</i>	‘the overtaker’ (moon is no longer visible)
29	<i>sua</i>	‘enter’
30	<i>sua ma'i</i>	‘the <i>su'a</i> on this side’ (optional thirtieth day) (a prohibition day for agriculture)

### Tilt of the crescent moon

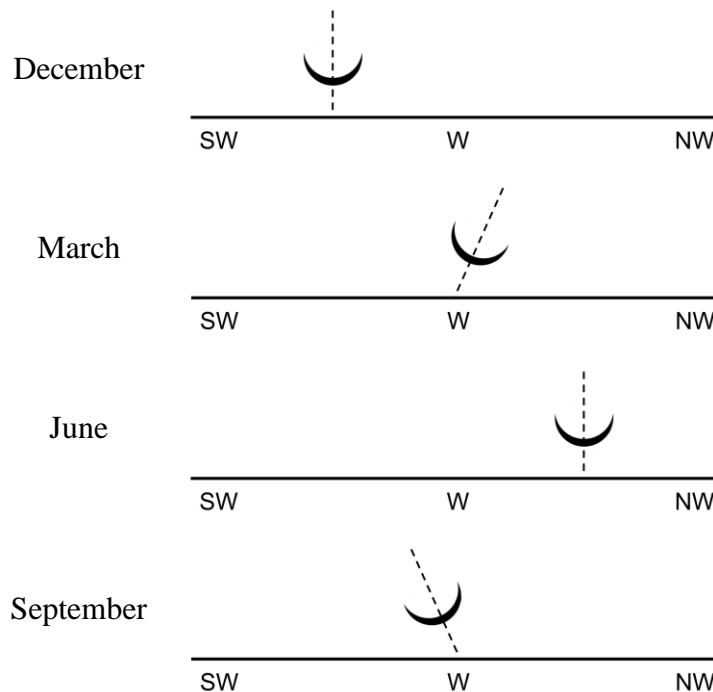
We’ve all noticed the tilted appearance of the crescent moon. In northern and southern latitudes the crescent moon is more tilted in summer, and less tilted in winter, but the tilt never completely goes away. The reason for this is that moon follows the path of the sun. Outside of the tropics the path travelled by the sun, the ecliptic, is always tilted with respect to the horizon, thus the crescent moon—which faces the sun—will also be tilted.



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Near the equator the crescent moon goes through periods where it appears to be level with the horizon. In this posture people have variously compared the moon to a plate, a bowl, a

boat, or a smile. Although the correlation is not precise,<sup>7</sup> in general the moon will appear level with the horizon around December and June (at the equator this is when the sun rises and sets nearly perpendicular to the horizon). Around March the crescent moon will appear tilted toward the north when observed at sunset; around September tilted toward the south.<sup>8</sup>



Seasonal position and tilt of the increscent moon as observed at the equator. © 2019 by David Mead. Released to the Public Domain (CC0).

Because of these seasonal shifts, people have used the tilt of the crescent moon as a kind of almanac. The Pamona living around Lake Tentena of Central Sulawesi conceptualized the increscent moon as a balance scale. When it was inclined or tilted toward the north (toward the sea), this was a good time to make salt by evaporating seawater;<sup>9</sup> conversely when the increscent moon was inclined or tilted toward the south (toward the mountains), this was a good time to dig iron ore; and when the moon was level people could expect success in either task (Adriani and Kruyt 1951:15). Bugis sailors associated the increscent moon tilting toward the north with the west monsoon season (December to April), and the

<sup>7</sup> While generally following the ecliptic, the moon can stray up to five degrees to either side of this path. The amount of tilt relative to the horizon also depends on how soon or long after sunset the crescent moon is observed. Of course the amount of tilt also depends on how many degrees one is removed from the equator.

<sup>8</sup> By 'titled toward the north' we mean that if the crescent moon is imagined as a bowl, then liquid from inside the bowl would be pouring off the north side, and similarly for 'tilted toward the south.' Observations of a decrescent moon (before sunrise) will show it to be tilted toward the opposite cardinal direction. The diagram in Ammarell (1999:54) we feel is incorrect and should be replaced with the one shown here.

<sup>9</sup> Expressed as *matomo bure, manga'a labu*, 'the salt is heavy, the iron light,'

moon tilting toward the south with the east monsoon season (April to October) (Ammarell 1999:54–55).

Famously, the tilt of the crescent moon was also noted by the Hawaiians. Because Hawaii lies just south of the Tropic of Cancer, people here experience one period during the year when the crescent moon appears level with the horizon. This period is associated with the rainy season (November to March). A tilted crescent moon, on the other hand, is associated with the dry season (April to October).<sup>10</sup>

## Tides

Coastal areas generally experience two **high tides** (*air pasang*) and two **low tides** (*air surut*) each day. In consonance with the position of the moon relative to the earth, high tides and low tides occur about an hour later on successive days.



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Between high tide and low tide the level of the ocean rises and falls. An incoming or rising tide is known as a **flood tide**. Depending on local geography, the rising sea level may produce a horizontal movement of water toward shore, known as a **flood current** (*arus pasang*). A falling or receding tide is known as an **ebb tide**, and may produce a corresponding **ebb current** (*arus surut*).

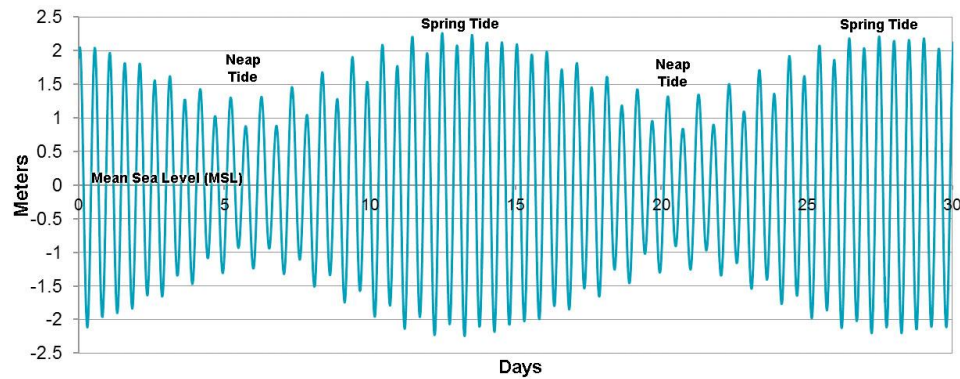
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<sup>10</sup> See *Wikipedia The Free Encyclopedia*, s.v. “wet moon” [https://en.wikipedia.org/wiki/Wet\\_moon](https://en.wikipedia.org/wiki/Wet_moon) (accessed April 6, 2019). However one must question the utility of applying the terms ‘wet moon’ and ‘dry moon’ worldwide.

We have found that in local languages of Indonesia the expression for high tide may be a noun (high tide), an adjective (indicating the state of being high tide), or a verb (to rise, of the tide or ocean) with high tide indicated by the completion of this action (the tide/ocean is risen), and *mutatis mutandis* for low tide. Also be alert to local terms for distinguishing different levels or phases of the incoming or outgoing tide. For example the Cia-Cia of southern Buton Island employ up to eleven such terms (Vermonden 2008:250–251):

Tide phase	Cia-Cia term	Notes
Slack water at low tide	<i>tangkano hoci</i>	cf. <i>tangka</i> ‘to resist, to restrain’
Flood or rising tide	<i>bubu'ano ure</i>	the ‘stones’ in the <i>mpanga-mpanga</i> zone are still visible; flood current is strong
	<i>hende'ano ure</i>	the ‘stones’ are not visible anymore; flood current slackens
	<i>citambo'a hende'ano ure</i>	the length of one more stride to reach the highest position
	<i>(hende'ano buso)</i>	<i>buso</i> , the most advanced point where the sea goes up
Slack water at high tide	<i>sungku'ano buso</i>	no current; cf. <i>sungku</i> ‘to brush’ (an hour before the moon rises or sets)
Ebb or descending tide	<i>pimboi tai</i>	sea level has descended by a span
	<i>citambo'a tai</i>	sea level has descended from its highest elevation by the length of one stride
	<i>(kura rancia'ano siwulu'u)</i>	water level is at the edge of the <i>hone pulu</i> zone; ebb current is strong
	<i>siwulu'u</i>	ebb current slackens; <i>siwulu</i> ‘to descend’
	<i>mohoci tai</i>	the sea is drained

Tides are also affected by the sun. At new moon and full moon the gravitational pull of the moon is augmented by that of the sun, creating high tides that are higher than usual and low tides that are lower than usual, known as **spring tides** (*pasang surut pernama*, *pasang laut pernama*, or simply *pasang pernama*). During first- and third-quarter moons the sun and moon are at right angles to each other, resulting in relatively moderate high and low tides, known as **neap tides** (*pasang surut perbani*, *pasang laut perbani*, *pasang perbani*).



Monthly tidal cycle showing spring tides and neap tides. Open access, courtesy of Miracosta College ([gotbooks.miracosta.edu](http://gotbooks.miracosta.edu))

In addition to terms describing the periodic rise and fall of the ocean as described above, for a coastal language you should also probe whether people have words for the following concepts:

- the reversal of flow in an estuary (*bolak-balik arus estuari*).
- the place in an estuary where river current meets flood current (*tempat aliran air tawar bertemukan arus pasang air laut*); a **foam line** or **flotsam line** may develop at this point.
- **high tide line** (*garis air pasang*), a line along a shore, estuary bank or mangrove forest marking the reach of high tide. Along a beach it is also called the drift line; when characterized by an accumulation of debris left by the high tide, in English it known as the **wrack zone** or **wrack line**.



Wrack line reveals last high tide mark near the dunes.

Photo credit: Steve Hillebrand, U.S. Fish and Wildlife Services. Public Domain.

- an area above the high tide line, known as the **supralittoral fringe**, supratidal zone, spray zone, or splash zone. In this area, the wind may shape sand into dunes. This area is often free of vegetation, although there are a few types of plants, tolerant of salt spray, that can colonize near it.
- the area of land exposed by the receding tide, known as the **littoral zone** (*zona pasang surut*, *zona litoral*). Biologists have found it useful to divide this area into three zones—high-tide zone, mid-tide zone, and low-tide zone, alternatively upper

midlittoral zone, midlittoral zone and intralittoral fringe—because of the different plants and animals that tend to be found in each. By contrast, Indonesian languages may distinguish between whether this area is rocky, sandy, or sand mixed with mud (a.k.a. tide flat, tidal flat, mud flat).



Rocky shoreline. Public Domain (Pixabay).



Tidal flat near low tide. © 2015 by David Mead. Released to the Public Domain (CC0).

- pools of water that remain after the tide has receded, known as **tide pools** or tidal pools (*genangan air pasang surut*). The Kulisusu people of northern Buton Island distinguish between tide pools lined with seagrass, called *nambo*, and tide pools with only a rocky or sandy substrate, called *paka*.



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- areas near shore covered by shallow ocean water even at low tide, sometimes called the **subtidal zone**.

Interestingly, the Kulisusu people have a name for the small channels that drain the last waters from a tidal flat near low tide, known as *salano bangsa* ‘boat paths.’ Compared to

the surrounding mud flat, the channel bottom is firmer and easier to walk on; the channels also provide just enough draft to help move a small boat from ocean to shore or vice versa.



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The Kulisusu karst topography is dotted with several **anchialine pools**. These are ponds near shore that, through dissolution of limestone rock, have an underground connection with the ocean and thus rise and fall with the tides.



E'e Cinariene, an anchialine pool of the Kulisusu area. According to legend a woman drowned in this pool and later her body was discovered in the ocean. © 2013 by David Mead. Released to the Public Domain.

The Kulisusu people also have a word for freshwater springs located in the intertidal zone, called *tasikana*. At low tide fresh water from these springs flows and pools among rocks, and was formerly much used for obtaining drinking water, washing clothes, and bathing. At high tide the springs are covered by seawater.



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We expect coastal languages to have a word for collecting shellfish and other sea creatures at low tide, mostly by hand-picking. Kulisusu people, however, wait for *spring low tides* to dig peanut worms from their sandy burrows. In general expect local people to have a great mastery of the relationships between their fishing activities and the times during the lunar cycle (and hence specific tides) when those activities are best carried out—see for example the list of fishing habits related to the tides, primarily among Sama fishers, cited in Ono (2010:280 ff.). Exploring these connections however would take us beyond the aims of this paper.

## Eclipses

A **lunar eclipse** occurs when the moon passes behind the earth and is partially or fully enveloped in the earth's shadow (umbra). Because the sun, earth and moon must be aligned for this to happen, a lunar eclipse can occur only on the night of a full moon. However, because the orbit of the moon around the earth is tilted with respect to the orbit of the earth around the sun, on most full moons the moon passes above or below the earth's umbra, or is only partially covered by it. When a total eclipse of the moon does occur, the time of totality may last anywhere from a few seconds to just over an hour and a half. Lunar eclipses are potentially visible by any observer who happens to be on the dark side of the earth at the time.



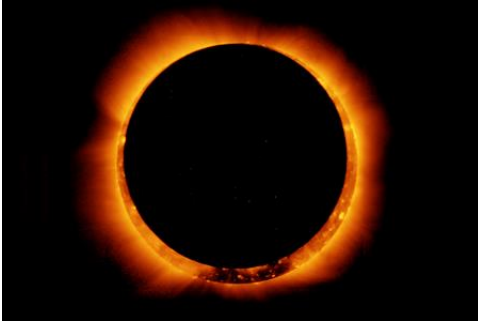
© 2015 by Thxguy via Wikimedia. Released to the Public Domain (CC0).

During a total eclipse the moon remains visible, shaded in colors that may range from coppery red to rust red, brownish gray or nearly obscured. Reddish glow is the result of sunlight being filtered and refracted by the earth's atmosphere. For this reason, a lunar eclipse is also called a 'blood moon.' In Indonesian a lunar eclipse is called a *gerhana bulan*. A partial lunar eclipse—only a portion of the moon is covered by the earth's umbra—is called a *gerhana bulan separa*.

A **solar eclipse** (*gerhana matahari*) occurs when the moon passes directly between the sun and the earth. However even at the best of alignments the moon's umbra (inner shadow) stretches only about a hundred miles across the surface of the earth, and only those who lie in the umbra's path—the so-called path of totality—experience a total solar eclipse. A wider swath of people living more or less close to this path will be able to see the sun partially eclipsed by the moon (*gerhana matahari separa*).



2014 Partial Solar Eclipse. Photo credit: T. Ruen. NASA Goddard Space Flight Center. CC BY 2.0 Generic.



Public Domain (NASA).

While total solar eclipses are relatively frequent—a total solar eclipse occurs somewhere on earth about every eighteen months—they are also rare: astronomers calculate that the same spot on earth will experience a total solar eclipse on average only once every 375 years.

An annular solar eclipse (*gerhana matahari cincin*) is similar to a total eclipse, except that the moon is too far away in its orbit to totally cover the disk of the sun.



Annular eclipse. © 2012 by Kevin Baird. CC BY-SA 3.0 Unported.

The Indonesian word for eclipse, *gerhana*, comes from Sanskrit *grahaṇa* ‘seizing, holding’ (Monier-Williams 1899:372), that is to say the seizure of the sun or moon by a celestial being:

In Sanskrit mythology, *rāhu*, a demon who deceitfully drank of the immortal waters and had this act exposed by the Sun and Moon, was punished by having its head cut off. From time to time, *rāhu*, generally

represented as a dragon's head, takes its revenge by swallowing the sun or the moon, thereby causing an eclipse. (Mintz 2017)

The name of this demon is also to be found in Malay *rahu*, Gayo *rau*, Toba Batak *lau*, Tagalog *laho* and Kapampangan *lawo* (Gonda 1952:58, 61, 63; Mintz 2017). Similar legends have been recorded from elsewhere in Indonesia, but differ in the name of the monster. In Tolaki the sky spirit was called *naga* (Van der Klift 1922:470, note 12),<sup>11</sup> while in Balantak the monster fish was called *garongo* (Kruyt 1932:365, footnote 1). In these locations the response to an eclipse was to shout and make a lot of noise.

In other places of Indonesia, however, eclipses elicited little reaction. Speaking of the To Lampu<sup>12</sup> of South Sulawesi, Van Ardenne writes:

Solar eclipses, lunar eclipses, comets, do not have any noticeable influence on him; it seems he finds them natural and often does not even take notice. Hitting on bamboo percussion tubes and making other commotion to expel the wicked spirit, such as one does on Java at lunar eclipses, does not happen here. (Van Ardenne 1912:420, our translation)

## Planets, comets, and meteors

The **planets** that are easily visible to human observers are Venus, Mars, Jupiter and Saturn. Two other planets are visible with the naked eye but can probably be ignored in our lexicography research: Mercury, usually hidden in the sun's glow, is briefly visible close to the horizon during twilight only a few days out of the year;<sup>13</sup> Uranus is barely visible to a keen-eyed observer on dark, clear nights—assuming one knows where to look for it.

Of the four planets **Venus** is easily the most conspicuous: at its brightest it outshines all the other planets and stars. Venus is never located more than forty-eight angular degrees removed from the sun. For several months Venus appears after sunset in the evening sky. However since Venus orbits the sun faster than the earth, it eventually catches up with and overtakes the earth. After this it moves to a position preceding the sun and becomes visible in the pre-dawn sky. One cycle of **evening star** to **morning star** back to evening star (the synodic period of Venus) takes 584 days.

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<sup>11</sup> From Sanskrit *nāga* 'a serpent' (Monier-Williams 1899:525).

<sup>12</sup> To Lampu is an exonym for certain Pamona peoples living along the Kalaena River basin south of the Takolekaju mountains.

<sup>13</sup> But compare Muna *kowine* 'name of star or planet, Mercury?' (Van den Berg 1996:606). To determine the best times to look for Mercury, check out John Walker's "Mercury Chaser's Calculator" at <https://www.fourmilab.ch/images/3planets/elongation.html> (accessed August 23, 2018).



Moon and Venus. Image credit: Gerhard Hüpdepohl.

Indonesian has several names for Venus derived from Arabic *al-Zuhara* ‘the bright one,’ including *bintang Zohrah*, *bintang Johar*, and *bintang Kejora*. As a morning star Venus is also known as *bintang fajar* and *bintang timur*; as the evening star it is known as *bintang senja* and *bintang barat*.

After Venus, **Mars** (*Mars*, *bintang Marikh*) is the most likely planet to be separately named. Otherwise Mars, **Jupiter** (*Yupiter*, *bintang Musytari*) and **Saturn** (*Saturnus*, *bintang Zohal*) may not be separately named but rather recognized, if at all, in a general way as ‘wandering’ or ‘travelling’ stars or as somehow less than true stars.

The nucleus of a **comet** consists of a collection of ice, dust and rock. As a comet nears the sun, solar radiation causes it to release gasses. This outgassing gives the comet a fuzzy appearance and sometimes also forms a tail. In Indonesian a comet is called a *komet* or *bintang berekor*, also (but less often) *bintang kemukus*,<sup>14</sup> *bintang berasap*, *bintang sapu*, *bintang berkotek*, and *si rambut gondrong*.



Public Domain (Pixabay).

An estimated forty tons of dust and other particles enter the earth’s atmosphere from space every day. Some of these bodies are large enough to create visible streaks of light

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<sup>14</sup> From Javanese *kumukus* ‘smoking, steaming,’ stem *kukus* ‘smoke, steam.’ In Javanese *lintang kumukus* (cf. *lintang* ‘star’) refers to both comets and shooting stars (Robson and Wibisono 2002:408).

as friction superheats the air along their paths to incandescence. These streaks of light, usually observed at night and lasting about a second, are known as **meteors**, and colloquially as shooting stars or falling stars.



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The usual Indonesian terms for this phenomenon are *meteor* and *bintang jatuh*.<sup>15</sup> A less common term is *bintang beralih*.

A space rock that survives its passage through the atmosphere and impacts the ground is known as a **meteorite**, Indonesian *meteorit*. The Indonesian terms *tahi bintang* and *cirit bintang* can apparently refer to both meteors and meteorites (Stevens and Schmidgall-Tellings 2004:205, 985). In the Badaic area of upland Central Sulawesi, it was believed that shooting stars resulted in the gold dust found in rivers there, whereas shooting stars that fell into the sea produced a certain kind of seashell (Kruyt 1938, II:384).

You may also find that people are aware of **meteor showers** (*hujan meteor*) and perhaps attach some significance to them.

## Stars and the night sky

To the untrained observer, the night sky might appear as a collection of luminous points, some brighter than others, on a black background crossed by a broad whitish band and some diffuse clouds. Even the slow movement of stars during the night might go unnoticed without close attention.

However, once one can successfully identify some noticeable elements, such as the Pleiades, the belt of Orion with its three aligned stars, and the Southern Cross, the night sky begins to take on a structure, to become familiar as these elements provide landmarks to orientate oneself. For the trained observer, the night sky is a cultural tool that can be used for spatial orientation and for reckoning time.

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<sup>15</sup> Both terms are apparently adapted from Dutch, respectively *metoor* and *vallende ster*.

### *About the movement of the night sky*

Between the Tropics, stars move almost straight from east to west during the night. Contrary to the sun, star bearings at rise and fall never change; this is the reason why stars can serve as a compass.

During the night, the position of a star will progress like the sun in the sky during the day. If a star is on the eastern horizon at dusk today, tomorrow at the same time it will be a bit higher on the horizon. Three month later it will be at its apex at dusk and, again three months later, it will be close to the western horizon at dusk. And exactly a year from now at dusk, it will come back to its initial position. This is why the night sky can be used as an annual calendar. It only requires determining a reference for the time of observation, usually dusk. This works in areas close to the Equator, where day and night duration does not vary much throughout the year.

### *Recording local knowledge about the night sky*

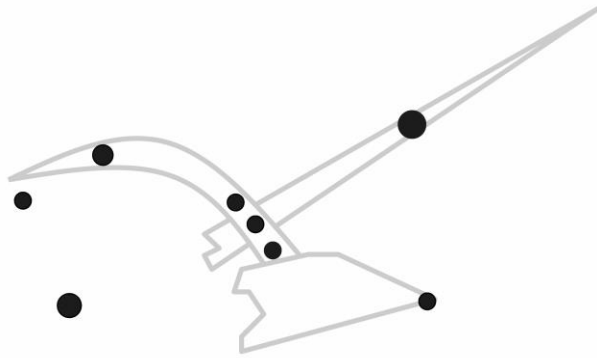
Recording local knowledge about the night sky is no different from the process used locally to transfer knowledge between generations: it mainly consists in observing the sky with a trained local and recording the vernacular names of **stars** (*bintang*) and the names and composition of local **asterisms** (Indonesian: *perbintangan*, *gugusan bintang*, *asterisma*).<sup>16</sup> However, even when the night sky is completely clear, only half of the sky is visible at a time. So observation sessions will have to be held on at least two different times during the night—close to dusk and close to dawn—or at the same time but at different seasons.

When an asterism is difficult to identify, it helps to ask a local expert to draw the asterism on paper. Once one observes the asterism in the sky, it is also necessary to identify with precision the stars that compose it (in terms of international nomenclature). Fortunately with smartphone applications today, this has become relatively easy.

It may be hard to identify precisely all the stars composing a vernacular asterism. Remember that there is no ‘official’ list of stars for each asterism; furthermore the composition may also differ between individuals.

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<sup>16</sup> We prefer here to use the term ‘asterism’ instead of ‘constellation’ (Indonesian: *rasi bintang*, *konstelasi*) since in astronomy constellations refer to regions in the sky (the 88 internationally recognized constellations cover the entire celestial sphere) while asterisms are simply groups of recognizable stars. In most cases you should avoid the term ‘star cluster’ (Indonesian *gugus bintang*), as this specifically refers to stars that are gravitationally bound—although a few famous star clusters are visible to the naked eye, including the Pleiades, Hyades, and the Beehive Cluster.



Bugis *bintoéng pajjékoé* 'the plough stars' in Orion ( $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ,  $\epsilon$ ,  $\zeta$ ,  $\eta$  Ori), following Ammarell (1999:138).

In addition, the names of vernacular stars and the names and structure of asterisms are usually associated with narratives explaining relations between local asterisms or the use of asterisms. Therefore, a complete investigation of vernacular stars and asterisms should ideally include the following elements:

- the vernacular name of a star or asterism with its meaning/translation;
- precise identification in terms of international nomenclature;
- vernacular narratives about the star or asterism;
- description of its use in the night sky (almanac and orientation).

For example, in the Cia-Cia area of southern Buton Island,<sup>17</sup> a main structural element of the local night sky is the opposition between Antares (called Pariama in Cia-Cia) and Aldebaran (Hase in Cia-Cia), lying in opposite parts of the night sky. Indeed, when Pariama rises above the eastern horizon, Hase sets in the west, and vice-versa—in other words, their right ascensions differ by approximately twelve hours.<sup>18</sup>

Local narratives explain that Hase is Pariama's brother. In one of these narratives, Hase was looking for a wife. He told his younger sister Pariama, "I'm going to a party, you stay at home." Hase went on to the party, where he saw a beautiful young woman. He approached her and told her of his desire to marry her. Only afterward did he realize that the woman was his sister Pariama. Hase then says to Pariama, "We must not follow each other anymore. We must stay far from each other. When you rise, I will set. And when you set, I will rise."

<sup>17</sup> All Cia-Cia examples are taken from my (Daniel's) ethnographic research in South Buton (see Vermonden 2008).

<sup>18</sup> Lines of right ascension are similar to longitude lines on earth, but mapped onto the celestial sphere. The right ascension of Antares is  $16^{\text{h}} 29^{\text{m}} 24^{\text{s}}$  while Aldebaran's right ascension is  $04^{\text{h}} 35^{\text{m}} 55^{\text{s}}$ .

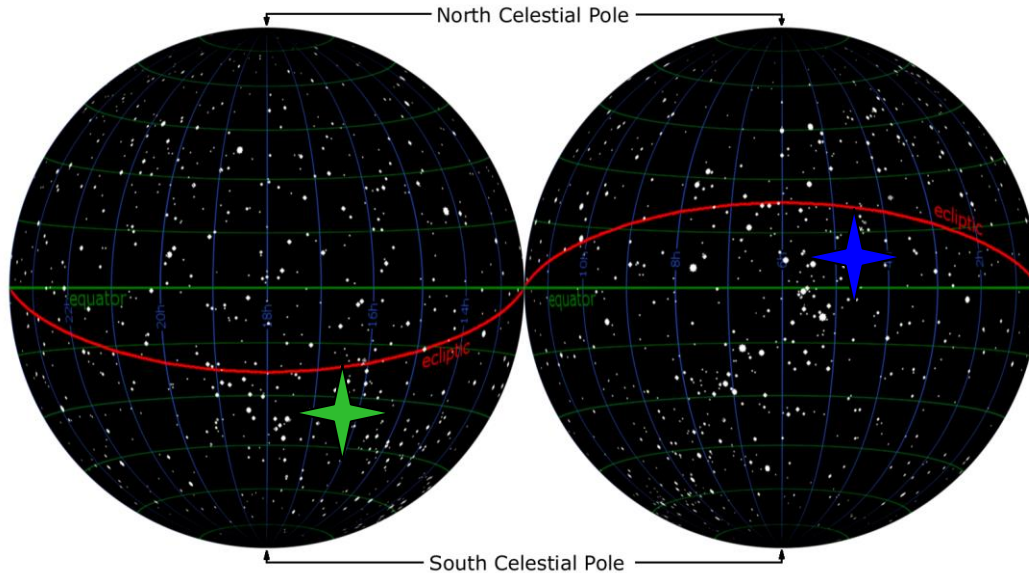


Diagram of the night sky, depicting stars, the ecliptic, the equator, and lines of right ascension and declination. Green and blue four-pointed stars mark the locations of Antares and Aldebaran respectively. Diagram © 2012 by Trf000 via Wikimedia Commons. CC BY-SA 3.0 Unported.

See Appendix A—Adriani and Kruyt’s description of the Tamangkapa asterism of the Pamona area of Central Sulawesi—for a longer example of how to describe a local asterism.

### *Some recurrent patterns of Indonesian and Austronesian night skies*

By comparing ethnographic case studies from Indonesia and the larger Austronesian cultural area, we can identify several recurring patterns in how people structure the night sky (see Vermonden 2008 for a detailed analysis). A main pattern, common in the Austronesian area but not specific to it, is an organization based on the opposition of two stars (or asterisms) lying in two opposite parts of the sky, for example in eastern Indonesia, Antares (or the associated asterism) and the Pleiades. Antares (with its reddish color and first-class magnitude) and the Pleiades are easily recognizable objects of the night sky. In Tanebar-Evav (Moluccas), this opposition is related to the prohibition of incest (Barraud 2001), which is a recurrent theme in narratives associated with stars and asterisms in the region. The Cia-Cia case study described above is another variation of this opposition.

In Indonesian and Austronesian skies, it is also common to find a crooked house in Crux, a shark and/or a ray in Scorpio or Sagitta, a stick or trunk formed by Altair and its two neighboring stars, and a bird in Sirius. Regarding the last, Osmond (2003:168) reconstructs Proto Oceanic \*manuk as the name of an asterism representing a bird. In modern Oceanic societies typically the head of this bird is Sirius, its southern wingtip is the star Canopus, and its northern wingtip either Procyon or Betelgeuse. Likewise Adriani and Kruyt (1912:234–235) describe a bird asterism known to the Pamona of Central Sulawesi, named Tamangkapa, but here people considered it to be a rooster, with the Pleiades as its head, the belt of Orion its body, and Sirius its tail.

Figures like spears, canoes, fish nets, fish (usually composed of four stars), and (triangular) traps are also common, but their positions in the sky are more diverse.

Finally, asterisms composed of the following stars are usually found in the area: one composed of alpha-gamma Aquilae, another including Antares and the anterior part of Scorpio, and a large asterism in Sirius (see above for an example). However, the objects associated with these asterisms are quite variable.

The **Milky Way** (*Bima Sakti* in Indonesian) appears like a more luminous strip in the night sky with a lot of small luminous points. In South Buton, it is called Naga, a term originating from Sanskrit *nāga* ‘serpent.’



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The **Large Magellanic Cloud** is located in the southern part of the sky. When Orion reaches its highest point in the sky, further to the south so does the Large Magellanic Cloud. It is called Hawu-hawu in Cia-Cia (compare *hawu* meaning ‘fog’) and Tanra Bajoé ‘sign of Bajau people’ in Bugis (Ammarell 1999).



Small and Large Magellanic Clouds above the Paranal Observatory in Chile.  
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### ***The night sky as almanac***

Two different systems for using the night sky as an almanac have been recorded in the Austronesian world. The first relies on the daily shift of four minutes of star position in the sky, at a specific time each day, either dawn or dusk. When dawn is used as the reference time, the star or asterism is observed to rise after a period of invisibility in the sky for several weeks (because the star was rising with the sun and the sunlight is so much stronger that the star is not visible). The first time during the year that a star is

(momentarily) visible just before the sun rises is known as its **heliacal rising** (*bintang terbit untuk pertama kalinya di waktu subuh*). The observation of stars' heliacal rise is attested for the Maori (Makemson 1941:113–115) and in the Caroline Islands (Goodenough 1955), but also for the Egyptians and Ancient Greeks.

When dusk is used, the movement of a star or asterism in the night sky during a season might be associated with the movement of the sun in the sky during the day. This seems to be specific to the Indo-Malay archipelago (including the Philippines). For example, in South Buton (Cia-Cia language area), Pariama (Antares) is the reference star for the east monsoon and Hase (Aldebaran) for the west monsoon. The position of these stars in the sky at dusk serves to indicate the progression of the associated season, just as the sun's position in the sky indicates the progression of daytime. At the beginning of the east monsoon season, Pariama at dusk is close to the eastern horizon. Mid-monsoon, Pariama at dusk is close to the meridian. Near the beginning of the west monsoon, Pariama at dusk is close to the western horizon and rapidly disappears below the western horizon each night at this period.

Another notable practice—which may be specific to the western Austronesian world—is the observation of the passage of an asterism to the observer's meridian (heliacal culmination). For instance, when Gusi in Cia-Cia ('the water pot'), in Cassiopeia, reaches the meridian at dusk, it starts to spill, announcing the west monsoon precipitations.

A second system recorded for time reckoning in the region relies on the shift of sunrise bearing during the year. Indeed, the sun rises due east at equinox (by definition). At summer solstice, it rises 23° 27' N and at winter solstice, it rises 23° 27' S. This system therefore relies on the correspondence of sunrise position with three different stars—remember that star rise positions never change.

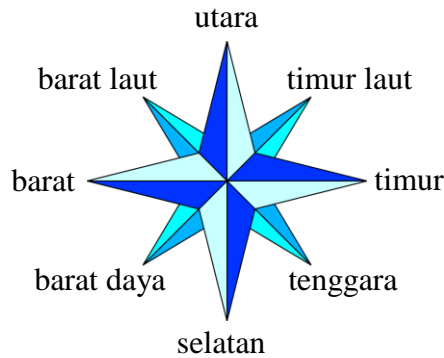
### ***The night sky used as a navigation tool (bearing and latitude)***

The bearing of stars at rise and fall is used as an orientation tool by Indonesian and, more broadly, Austronesian seafarers. Stars are used up to a height of ten to fifteen degrees above the horizon, then another star might be chosen, whose bearing is close to the former one. This system is called a 'star path.'

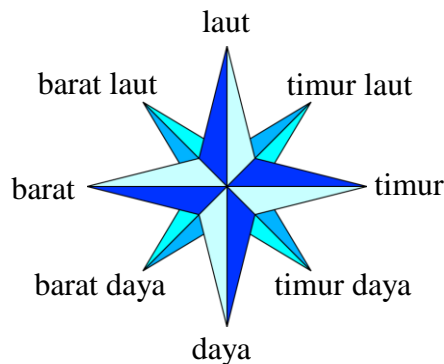
Names of stars and asterisms might also be used to name cardinal directions and, optionally, their subdivisions. Note that the position on the 'star compass' does not necessarily correspond to the exact bearing of the rise or fall of the star (Frake 1995). Indeed, a compass consists first and foremost of dividing the horizon in 4, 8, 16 or 32 directions and providing these directions with a name. In addition, a single asterism like the vernacular equivalent to the Southern Cross might be used to name more than two different positions on the compass: rise, inclined at 45° E; straight (passage to the observer's meridian); inclined at 45° W, fall.



When considering how a cardinal system could develop, a look at Malay compass points is instructive.<sup>19</sup> Malay terms for cardinal directions and the primary intercardinal directions (northeast, northwest, southeast, southwest) are shown on the following compass rose:



However three terms were not original to the system. *Utara* is a loan word from Sanskrit *uttara* ‘upper, higher, superior; northern (because the northern part of India is high)’ (Monier-Williams 1899:178). The term *selatan* is derived from *selat* ‘strait,’ in reference to the Strait of Malacca. At the time this term was adopted, this strait must have lain to the south, that is, when the Malay capital was at Malacca. The term *tenggara* is of obscure origin, but was probably also borrowed.<sup>20</sup> In fact we can reconstruct what the earlier system must have looked like, before these three terms were adopted.



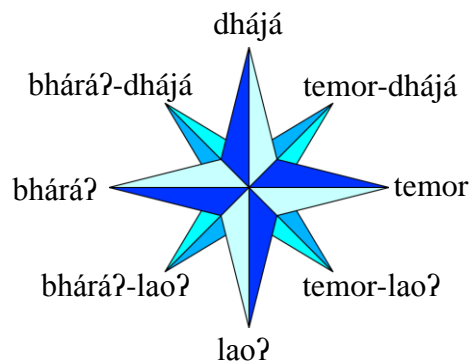
Terms for east and west were originally the names of winds, derived respectively from PMP \*timuR ‘southeast monsoon’ and PMP \*habaRat ‘southwest monsoon.’ The terms

<sup>19</sup> The discussion of Malay compass points is adapted from Adelaar (1992:114–115) and Adelaar (1997). See also François (2004) for an insightful discussion of the evolution of space reference terms in Oceania.

<sup>20</sup> Adelaar (1992:115, footnote 161) suggests it is from Tamil *ten kara* ‘south bank.’ Liebner (2005:309 ff.) however suggests that the original reference may have been to a frequently visited ‘procurement area,’ which for Malays was the Java Sea.

for north and south were originally geographic directional terms, compare respectively PMP \*daya ‘upriver, toward the interior’ and PAN \*lahud ‘downstream, toward the sea.’ As Adelaar (1997:59) notes, this system, which originally was a directional system, must have become cemented into place as a cardinal system while the Malay kingdom was centered at Sriwijaya (present-day Palembang in southern Sumatra), since it is in this location that the sea lies to the north.

Interestingly the Madurese make use of cognate forms, but here the terms surrounding the compass rose are ‘flipped’ relative to Malay, reflecting that the principal Madurese ports lay on the south side of Madura Island (Adelaar 1977:55). Note that the Madurese forms provide additional, comparative evidence that this was originally a directional system and not a cardinal system.



In the history of Malay terms we have already seen three sources for the names of cardinal directions: they can be borrowed from a foreign language (as with Malay *utara*);<sup>21</sup> they can be derived from the names of seasonal winds (as with Malay *timur* and *barat*); and they can be terms that originally referred to features of the local geography (as with Malay *selatan* and Sriwijayan Malay *laut* and *daya*). However names for cardinal directions can have at least four other sources:

- from the course of the sun or, less frequently, other heavenly bodies such as the North Star or Big Dipper. In this system east is the direction where the sun rises, and west is the direction where the sun sets. Compare Minangkabau *puhun* ‘east’ and *ujuəŋ* ‘west,’ literally ‘source’ and ‘end’ (of the sun’s course). A thirty-two point compass rose used by Arabic seafarers adopted the names of stars based on their risings and settings, although with certain ‘adjustments’ to accommodate equally spaced azimuths (Halpern 1986; Frake 1995:155).
- from the names of seasons or temperatures, e.g. a word which originally meant ‘cold weather’ or ‘cold country’ comes to mean ‘north’ (Brown 1983:133–134).

<sup>21</sup> Besides *uttara* ‘north,’ other Sanskrit terms which have made their way into one or another Indonesian language include *pūrva* ‘east,’ *dakṣiṇa* ‘south,’ *paścima* ‘west,’ *aiśana* ‘northeast,’ *agni* ‘southeast,’ *nairṛtī* ‘southwest,’ and *vāyavya* ‘northwest’ (Adelaar 1997:67, following Gonda 1952).

- from canonical body orientation. Compare Hawaiian *ke akau* ‘north,’ also meaning ‘to the right,’ and *ka hema* ‘south,’ also meaning ‘to the left.’<sup>22</sup> These terms make reference to a person canonically facing west.<sup>23</sup> For the Bada’ language of Central Sulawesi, Woensdregt (1925:30–31) describes a complete set of sixteen cardinal points that, with the exception of east and west, were based on a cosmic deity conceived of as lying supine upon the earth with his head to the south and his legs to the north, e.g. ‘left leg’ referred to the northwest, ‘right leg’ to the northeast, ‘right armpit’ to the southeast, and ‘left armpit’ to the southwest.
- from general direction terms such as ‘up,’ ‘down,’ ‘below,’ ‘behind,’ ‘across,’ or ‘along’ (Brown 1983:134–135). Compare English *north* from the Proto-Indo-European root \*ner- ‘beneath, below.’ One must suspect that such terms at one time made reference to geographic features or to canonical body orientation.

Given the prominence of the sun in human experience, it is perhaps unsurprising that the cardinal directions east and west are more salient—and more likely to be named—than are the directions north and south (Brown 1983:143–145). In our own experience, many languages of Sulawesi have terms for cardinal directions that, with the possible exception of native terms for east and west, have been borrowed directly from Malay. In our research we should be alert to the older directional systems which may continue to play a significant or even greater role in the everyday lives of the people where we work. As Adelaar has noted:

The dictionaries of Iban (mainly Sarawak), Singhi (Sarawak), and Ngaju Dayak (Central Kalimantan) do list terms for north, east, south, and west, but these terms are obviously borrowed from Malay. Their occurrence by no means implies that the speakers of these languages make full use of them for their orientation in daily life. (Adelaar 1997:68)

One final point deserves mention. Perhaps surprising to the western mindset, some Austronesian languages also make reference to the center—the place where all the cardinal directions meet—and this place is accorded status as a cardinal location equal to north, south, east, and west, particularly in cosmological or symbolic classification. This may come out for example in augury, or in how officials are to be seated at certain ceremonies.

Doubtless in many places where we work there are connections between spatial orientation and the native view of the cosmological order. However a discussion of cosmology—either for Indonesia in general or for individual cultures—lies beyond the scope of this paper.

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<sup>22</sup> From respectively Proto Central Eastern Polynesian \*katau ‘right’ and \*sema ‘left’ (Brown 1983:142).

<sup>23</sup> In the complete system, which Hawaiian does not possess, west would then be ‘in front’ and east would be ‘in back, behind.’

## Appendix A: The rooster asterism

The following is an English translation of an excerpt from the second volume of Adriani and Kruyt's *De Bare'e-sprekende Toradja's*, published in 1912. Original pagination is indicated by including the page number in square brackets, e.g. [p. 234]. We append this selection as an example of a full description of an important local asterism.

For the interested reader, additional stories concerning the rooster asterism among other people groups of Central Sulawesi can be found in Kruyt (1938, II:380–382, 398–403).

[p. 234] *The constellation Tamangkapa.*

To determine the time at which one begins working/reclaiming the fields, people pay attention to the position of a constellation that in Bare'e is called *Tamangkapa* 'the Flapper, the Rooster'.<sup>24</sup> People think of a rooster, of which the Pleiades are the head, the belt of [p. 235] Orion the body,<sup>25</sup> and Sirius the tail. When *Tamangkapa* is seen at dusk in the east just above the Horizon, one commences work on the rice fields. When the head of the constellation approaches the zenith (always at the start of evening), this is the time for that work to cease.

People give the following names to the various positions of this constellation:

1. *Tande wua*, that is, 'hold an areca nut in the hand.' People say herewith that if one points to the constellation with an open hand, on which an areca nut has been placed, the nut will not roll off the hand. In other words, the hand has a nearly horizontal position. This is the position where, at nightfall, the head of *Tamangkapa* is just above the horizon.
2. *Yuli wua*, that is, 'the areca nut rolls off,' namely the hand, when one uses it to indicate the position of *Tamangkapa*. In this position, at nightfall the constellation lies about 20° above the horizon.
3. *Sungke toru*, that is, 'lift up the coolie hat.' At nightfall *Tamangkapa* lies so high that someone wearing a coolie hat (*toru*) must lift it up (*sungke*) in order to see the constellation.
4. *Oyo mpiso* 'empty between space.' In this position, at nightfall the constellation lies just at the zenith, such that the Pleiades are as far past the zenith as the belt of Orion is before it.

<sup>24</sup> [Footnote 1, page 234] *Tamangkapa* consists of the prefix *ta*, which (besides *ka*) is very common with plant and animal names, and *mangkapa* 'to flap, to flutter.'

<sup>25</sup> [Footnote 1, page 235] The belt of Orion is called the *sowo* 'crop' of the rooster, also called its *tingkula*. *Tingkula* is a piece of wood on a bow that prevents the bow from being fully drawn.

5. *Mompasambali*, that is, ‘gone over to the other side,’ when Tamangkapa is past the zenith. When the constellation approaches this position, then no more rice is planted.

In Napu the Pleiades are called *Mbalunu* [as corrected in the Errata]. The To Kulawi call the Pleiades *Malunu*; these must be seen in the morning to the west just above the horizon. Also some Bare’e tribes, such as the to Pu’u mBoto, pay heed to the position in the morning. We will see below that for the most part the Toraja name the phases of the moon after its morning appearance. The Toraja claim that from time to time the constellation vibrates. As long as this phenomenon lasts, rice should not be planted, because the heavenly rooster has not yet come to rest, and he will peck up the sown rice.

Not all Torajan people adhere to the practice of observing the position of the constellation. In the Kaili area and among the To Napu, for example, people plant at all times of the year. The result of this is that rice birds wreak havoc as they fly from one ripe field to the next.

[p. 236] Concerning the constellation Tamangkapa there are various stories, which however all come down to this, that it was originally a rooster named Manu Tadia. This animal used to live on earth. Some say that an ancestor of the Toraja struck one of its wings lame, whereupon the bird floated into the heights and took its place in the heavens. The lame wing can also be seen in the three small stars that are at an angle of about 45° to the belt of Orion.<sup>26</sup> The rooster would still crow; it does this with a humanlike voice, thus: *Totoro'o manu tadia, giragirana raja salua pituru ilana taya, imanuru*.

No one knows the meaning of these words, leading to the presumption that this is not true Torajane, but has been borrowed from foreigners.

According to others, in olden times the Manu Tadia was a rooster, which provided the people with rice; whenever he crowed, he vomited rice. When humankind had increased in number, he could no longer keep up with this work. He then let men know that he was going to the vault of the sky, and that people should watch the signs, which he would give, when to plant rice. Again others tell you that the Pleiades are a man and a woman. The man is called Taludidi, and the woman Olitambo.

We also heard others claim that Tamangkapa is a rooster with seven heads.

One story, probably of foreign origin, says that Tamangkapa had been a woman who changed into a hen. We encountered a more detailed story about this among the To Kadombuku: In ancient times men had no chickens yet. At that time there lived a slave, who was married and had a son, who was still in the cradle. Not long after that the slave was sold and brought to another village. The child stayed with his father. When the child

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<sup>26</sup> [Footnote 1, page 236] The Bare’e-Toraja call these three small stars: *iku mbalesu* ‘mouse tail.’ Among others the aforementioned story is not known. Again others say that the Tamangkapa was a rooster of Lasaeo, the demigod who descended from heaven to earth. Lasaeo once got angry at the animal, because it was constantly pecking up the rice which his wife was treading. So he hurled his hunting spear at the rooster, which broke its wing. The bird lifted itself into the air, and became the Tamangkapa.

had become bigger, the father once was so quick-tempered with him, that he struck him with a piece of wood on the head, so that a scar of the wound remained. When he was bigger, the son was sent about everywhere by his master, and so he also came to the village of his mother. Not recognizing her, he fell in love with her and married her. After they were married, there came a great drought, and all the trees died. The cause of this calamity could not be traced.

At that time, the said woman was delousing her husband, and she saw the [p. 237] scar. She said: "I've heard that the father of my son once struck him on the head, so that he must have a scar like yours." The man replied, "I got this scar when my father hit me with a piece of wood." The woman began to nourish a suspicion, and she asked him what he knew of his mother, who had sold her, and who had raised him. The answers to these questions convinced her that she was married to her son.

As it happened all the leaders were gathered to deliberate what measures needed to be taken to stop the great drought. The woman went to the gathering and told them how, unwittingly, she had become the cause of the calamity. According to custom she should be killed, but the leaders were opposed to this, because the evil had not been committed intentionally, and because the woman had indicted herself. The woman helped them out of their embarrassment by saying, "Make a hut for me far away in the wilderness, where I will dwell. After seven days come to see me; there you find a big flock of chickens. A portion of them will run away into the jungle; but seize the rest, bring them home, and breed them. On the ridge of the roof you will see a white chicken. Don't grab it, because that's me. Again after seven days, look up to heaven, and you will see me there. Then arrange your field labor after my course." Everything came to pass as the woman had said. People add that whoever knows the name of the woman will have unlimited power over chickens, also that jungle fowl will come to him, if he calls them.

We encountered a completely different story about Tamangkapa at Lake Posso. There people tell of a man who visited the underworld. When he wanted to return to earth, the Hades dwellers showed him the way, saying, "When you come to a fork, don't take the path on the right, but take the one on the left-hand side." Following these directions he came to a river, across which lay a tree trunk as a bridge. When he went to step on it, however, the bridge began to move so much that he never ventured over (this is the bridge over the Torajan Styx, see chapter XVII "Corpse Treatment"). He now followed the other path, which after a long walk brought him to the Tamangkapa. Here he found a great village, and life there was so pleasant that he decided to stay there. The people of Tamangkapa village now taught him in the secrets of agriculture, and also told him how with fieldwork he needed to look to the position of the Tamangkapa in heaven. They also told him that he should never climb to the attic of the house where he stayed. This information aroused his curiosity so much that, one time when all the villagers had gone to the field, he climbed to the attic. Suddenly he could see the earth; he also saw his own house, and when his yearning for the earth became so strong within him, he jumped down. He landed with [p. 238] such force that he was buried in the ground up to his neck. Now he called all the inhabitants of his village together. He told them all that had happened to him, including the lessons he had received in agriculture. He added that after

seven days he would change to stone. So it also happened, and that clump of stone can still be found on the southern bank of Lake Posso.

If one asks a Torajan simply: “Who taught you rice cultivation?” the reply is always “Lasaeo” (the heavenly being who descended to earth).<sup>27</sup>

## Appendix B: Moon days

In this appendix we have collected excerpts from the writings of Alb. C. Kruyt concerning the names and significance that moon days formerly carried among people groups of central and southeastern Sulawesi. These excerpts have been drawn from five different sources. We present them below in the order in which they appeared in print.

### *Pamona*

From Adriani and Kruyt (1912:265–268), translated by David Mead.

*N.B. Adriani and Kruyt’s discussion of moon days was continued on pages 268a and 268b. Despite several attempts, we have yet to locate a print version which includes these pages. The translation below thus ends prematurely. At least some of the data from the mentioned chart of the names of moon days in nearby languages can be recovered from Kruyt’s later publication, De West-Toradjas; see the final section below.*

[p. 265] *Moon days.*

When naming the days of the lunar month, along with the stipulations concerning agriculture that apply to those days, we also discuss the etymological derivation of their names, because for each of the names another explanation is to be given, which indicates the peculiarity of that day.

1. *Eo mbuya*, ‘day of the moon,’ the new moon day, which follows the night at the beginning (sunset) of which the crescent moon was just to be seen. On this day agriculture stands still, the day is *umapo*. It is also not possible to grind a tool, since the sharpener would be injured by the polished tool. *Mataja wuya*, *bare’e madago rapangasaka*, *mawela tau*, ‘The moon is sharp, it is not good to grind on the day, one would then be injured.’

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<sup>27</sup> [Footnote 1, page 238] Besides Tamangkapa the Toraja also know Venus as evening and morning star. In Bare’e the former is called *Silo angga* ‘torch of the spirits’ (at Lake Posso: *Pancula*), the latter *Pombote yangi*, ‘the one who crosses the sky (sea).’ Furthermore, in the coastal districts people know two constellations positioned right next to each other: *Mangibani*, ‘shark,’ and *Boleki*, ‘stingray.’ It is said that the shark pursues the stingray, but is unable to catch it in that it (the stingray) keeps its tail bent (cf. also *Tontemboansch Woordenboek* s.v. “pair” and “tangirian”). When at nightfall the constellation Tamangkapa sets, then Boleki rises. In the coastal areas there is also a story of the constellation Naga, formerly an animal on earth that did not want to be tamed, and that moved to heaven.

2 to 9. The eight subsequent days have no name. They are called *uayueo*, ‘the eight days,’ further distinguished in *ka’isanya uayu*, ‘the first of the eight,’ or *uyuenya*, ‘the beginner’; *karaduanya*, *katatogonya*, *ka’aoponya*, etc. ‘the second,’ ‘the third,’ ‘the fourth,’ etc., and *kapusanya uayu*, ‘the end of the eight.’ These days are all beneficial for agriculture. The moon has already reached its first quarter.

10. *Wuya mbawu kodi*, ‘the little pig-moon,’ and

11. *Wuya mbawu bangke* ‘the big pig-moon.’

Of these two the latter is a prohibition day. On both days there is a danger that pigs are in the field, ‘because it is their moon.’ The one who knows the remedy (the magic herbs) for fending off pigs from his field, it behooves him not to leave the work in the field on the 11th. Similarly someone who intends to stay the whole night and go clamoring through his field to scare the pigs, can risk using the day as a regular work day in the field.

[\[p. 266\]](#)

12. *Tau koi*,<sup>28</sup> ‘the small people-moon’ and

13. *Tau bangke*, ‘the big people-moon’ (full moon).

Of these two the first is a prohibition day. The name seems to have arisen in contrast to the name *wuya mbawu*, and to mean days on which one doesn’t bother about any of the animals, no animal-moon, thus a people-moon. The distinction between ‘small’ and ‘big’ probably means nothing more than a difference between no.1 and no. 2. Agricultural work on the small person-moon day is punished by the fact that the rice does not progress higher than a finger length, and bears no fruit.

14. *Kakunia* (among the To Pebato: *sompe*), A day on which all work is lawful. *Kakunia*, from *kuni* (*makuni*), ‘yellow,’ means ‘yellowness,’ ‘it is yellow,’ because early in the morning, when the moon goes down, the sun is already yellow, that is to say, completely above the horizon. *Sompe* means ‘lying on,’ because at the dawn of morning light the moon still ‘lies on the horizon.’

15. *Toginenggeri* (the To Lage simply say *ginenggeri*), a prohibition day for agriculture. Violation of this decree is taken out on the field, because the pigs (wild or tame) and buffalo will not cease to beleague the fence, to walk back and forth, and try to trample the ground. *Ginenggeri* is formed from *gengge* with infix *-in-*, more commonly with the frequentative infix *-al-*: *mogalengge*, the ‘going back and forth’ of animals seeking food. *Toginenggeri* thus means: ‘one suffering from [animals] going back and forth.’

16. *Pombarani*, a prohibition day for agricultural work. The name, which means ‘burner,’ is from the stem *wara*, ‘on fire, burning.’ The day is so named because in the morning the

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<sup>28</sup> [Translator’s note: A form *koi* with the meaning ‘small’ is not listed in Adriani’s 1928 *Bare’e-Nederlandsch Woordenboek*. Possibly this is a misprint for intended *kodi*.]

moon precisely illuminates the entrance of a house, which is set glowing. The entrances to houses originally faced west. *Pombonce* is a second name for this day, seldom heard, and totally improper. The beams, which run on both sides of the house, are called *pombonce*, 'hangers' (from *wonce*), and with a second name *pombara*. Therefore the name of the day *pombarani* alternates with *pombonce*. The punishment for practicing agriculture on *pombarani* is that the harvested rice will quickly run out, and regardless of how much is harvested people will suffer hunger before the new.

17 to 20. After these two prohibition days, there are four, which are called *wani*, 'obscure,' because the longer the later the moon rises, and thus a portion of the night is left dark. These days are beneficial for the field labor.

21. *Meronco*, among the To Pebato the fifth *wani* or *kapusa mbani*, 'the last dark day.' The tribes, who call this day *meronco*, use the name *kapusa mbani* for the 20th. [p. 267]

Among the To Pebato this day is also good for agriculture, but for the other tribes only for someone who has already become a widow or widower. The word *ronco* means 'pushed in.' Among others, it is used when the Toraja curse their chief enemies, the To Kinadu: *ronco mata nto Kinadu*, 'may the eyes of the To Kinadu be pushed in.' At *meronco* the moon is now approximately in the last quarter, and when the sun is fully risen, the moon is at the zenith. *Matanya naronco ndeme*, 'her eye (disk) is pressed by the sun,' her light is blinded by the sun. This is actually an allusion to the double significance of *mata*. Since *meronco* is therefore an optional *umapo*, those who hold this day as such declare that the reward is that *naronco tananda ala kasondo mpae*, 'the floor beams of the barn will be squeezed by the heaviness of the large amount of rice.'

22. *Kawe*, a prohibition day. The stem *kawe* means 'beckon,' in the well-known Indonesian way, by hand making the movement of someone to himself. *Kawe* also indicates reaching out to something that one seeks to achieve; the doublet *kabe* means to extend one's hand to receive something. When the sun rises on this day the moon is not yet at the zenith but reaches out to the highest point, as someone who has to retrieve something from somewhere, but cannot. If one works on this day, there is a danger that the children, who reach out toward food on the rack above the fireplace, or to the sheaves of rice that lie there in the smoke, in order to take them and start threshing, suddenly fall dead. Among full grown adults there is no harm, for that matter they do not need to reach out for cooked or unhusked rice to take them from the smoke rack. People who have no children work on that day. It is the rice planted on *kawe* that kills children, who on that day perform the action of *kawe*, and thus imitate the moon.

23 to 25. These days are usually also called *kawe* (the second, third, and last, *karaduanya*, *katatogonya*, *kapusa ngkawe*); also indeed *ara ngkawe*, 'under *kawe*,' probably because the moon is no longer on the point where it reaches the zenith at sunrise, but is already below it. On these days all work is permitted.

26. *Tu'a marate*, 'the long trunk,' a prohibition day for agriculture. If the rice field is worked on this day, then the field crops will be bitten off or gnawed by pigs or mice, so

that just the stumps or trunks of the gnawed off field fruit remain. On that day at sunrise, the moon is no more than a stump or trunk of her full disc. *Tu'a* is actually a stump or trunk of a hacked off tree.

27. *Tu'a rede*, 'the short stump,' a day on which working in the field can not hurt. The moon is still slightly smaller and stands [p. 268] slightly lower at sunrise, hence the name. The Toraja who dwell further to the east call this day *oyonya saeo* or *oyonya sandeme* 'with one more day in between,' that is to say between the previous day and the day that the moon is no longer visible at sunrise.

28. *Poliunya*, 'the overtaker,' that is to say, of the sun passing the moon, so that the moon at sunrise is no longer visible, since the sun has gone past. This day is good for the agriculture.

29. *Sua*, 'enter, inward,' probably because the moon is then inward for good, can no longer be seen at sunrise.

Every other month there are 30 days. This 30th day is called *sua ma'i*, which is: 'the *sua* on this side,' which is next to it, thus: the second *sua*. On this day the agricultural work is banned, because then all the animals of the field would 'enter' and destroy the crop.

So the days are named after the position of the moon at sunrise. This would be strange, if with the naming of the moon days one thought about normal time reckoning. The night however is the first part of the natural day, and precedes the day; One would therefore expect the position of the moon to be recorded in the evening, and the day to be named after the night. For agriculture however the night is of no importance. When people set out early in the morning, they determine whether the moon that commands/controls the day, i.e. the morning-moon, can hurt the agricultural work of that day. From this it is clear that the concerns of agriculture, and that alone, have given rise to the naming of the days.

#### *Names of the days among other tribes.*

We give separately (page 268a) a list of the names of the days among other Torajan tribes.

Among the To Ampana an intercalated month<sup>29</sup> of thirty days is called *wuya mpoasa*, 'fasting month.' Naturally this name was coined under influence of the coastal Mohammedan inhabitants. A month of twenty-nine days is called *wuya tagana*, 'insufficient month,' or *wuya nto'u*, 'year month.' Of all the days, the first, 15th, 21st, 22nd and 29th are unfavorable for field labor. The 16th day is called *lombo*, while among most Bare'e tribes it is named *to ginenggeri*. Peculiarly, we find *lombo* again among the To Pu'u mBoto on the south side of Lake Posso (*lombo* means 'hanging limp' of the scrotum; *lombo* is called the *wuya i kai*, 'the moon of grandfather,' as old men have a

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<sup>29</sup> [Translator's note: Dutch *schrikkelmaand*, probably to be understood in this context as a month with an intercalated day.]

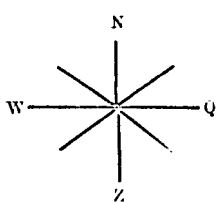
dangling scrotum). Concerning these To Pu'u mBoto, it remains to be noted that *lombo*, which under the name of *toginenggeri* is a prohibition day in agriculture, is considered to be a very suitable day among the To Pu'u mBoto, so that people strive to do the planting on that day. Among the same tribe, the day following after the night on which the new moon ...<sup>30</sup>

### **Mekongga (Tolaki)**

From Kruyt (1922:452–453), translated by Charles Elias.

[p. 452] The position of the moon accounts for the names of the days. Moon days are:

- |   |                                     |
|---|-------------------------------------|
| 1. <i>mata loso</i> (when the moon can only just be seen) |                                     |
| 2. <i>riolo</i>   | 17. <i>riolo</i>                    |
| 3. <i>mata nggawe</i>                                     | 18. <i>mata nggawe</i>              |
| 4. <i>tombara kawé</i>                                    | 19. <i>tombara kawé</i>             |
| 5. <i>merawusi</i>  | 20. <i>merawusi</i>                 |
| 6. <i>mehau-hau</i>                                       | 21. <i>mehau-hau</i>                |
| 7. <i>mata tindo</i>                                      | 22. <i>mata tindo</i>               |
| 8. <i>tombara tindo</i>                                   | 23. <i>tombara tindo</i>            |
| 9. <i>mata nde'ue</i>                                     | 24. <i>mata nde'ue</i>              |
| 10. <i>tombara te'ue</i>                                  | 25. <i>tombara te'ue</i>            |
| 11. <i>to'eno</i>   | 26. <i>to'eno</i>                   |
| 12. <i>mata leleanggia</i>                                | 27. <i>mata leleanggia</i>          |
| 13. <i>tombara leleanggia</i>                             | 28. <i>tombara leleanggia</i>       |
| 14. <i>molambu</i>  | 29. <i>wawo ndoaha</i>              |
| 15. <i>mata mohehe</i>                                    | 30. <i>mata mbusu</i> <sup>31</sup> |
| 16. <i>tombara mohehe</i>                                 |                                     |



[p. 453] I also found here a remarkable sort of wind roster linked to the names of the [moon] days. When, while hunting, one wounds a deer and one does not know where to go and find it, one puts four pieces of wood over one another crosswise, thereby obtaining a wind roster with eight points of a compass. Next one starts to count beginning at the point that shows eastwards (*mataloso*) [first crescent moon]. The next point is *riolo* [second crescent moon]. Then follows *matanggawe* and so forth to *matandeue* which points again to the East. One continues counting until the name of the day of that particular moment has been reached. Next, one starts searching in the direction indicated by the stick on which the name of the day has fallen.

<sup>30</sup> [Translator's note: Here ends the text prematurely, as noted in the introductory comments to this section.]

<sup>31</sup> [note, page 452] In volume I, page 267 of his work, *Die Sunda-Expedition*, Dr. Elbert himself errs by giving the names of the moon days as the names of the months.

## Wana

From Kruyt (1930:541–543), translated by David Mead.

[p. 541] *Moon days*. One reason that people incur a lot of calamity in relation to their fields is when they don't heed the position of the moon. According to the phase of the moon each day has its own name. When the very narrow crescent moon is still to be seen after sunset, this is called *manu mataja* 'sharp rooster.' The day named after it is not only unfavorable for field work, but for almost all kinds of labor. Then follow some days which have no name but which are only counted. These are all beneficial for the agriculture; when the moon is waxing, all the work done in the fields will be prosperous.

The tenth day is called *songanga*. This one is good as well as the following *wawu koi* 'small pig,' and *wawu bae* 'big pig.' Then follows the day after the full moon, *simpayai* 'equal of passing,' i.e. when the moon sets the sun rises, they forsake each other. This is a very unfavorable day. If one does not rest, [p. 542] and does something to the field, the crop will be destroyed by all kinds of beasts, and all happiness and blessings will leave us (*napalaika kita rasi*).

Then follows *wimbilaka* 'not perfectly around more'; On this day it is good not to work in the fields (*ta se'i rapolingaake* 'no field work is done'). The next day, *kainao* 'with life (*inao*),' the moon hasn't completely disappeared at the break of day. In particular it is unfavorable to plant on this day, because then mice will come tatter the crop (*nakao mbalesu*). Then follows *lombo*, a day that lends itself to burning wood on the fenced off land. In our work concerning the Bare'e-speaking Toraja, volume II, page 268, we have already noted that this name is also used among the to Pu'u Mboto on the south side of the Lake Poso, while the other Bare'e-Toraja say *toginênggeri*, and typically this day is taken to be very unfavorable. *Lombo* means 'hanging limp' of the scrotum, and that is why the To Pu'u Mboto playfully call this day *wuya i kai* 'the moon of grandfather,' because old people often have a sagging scrotum.

After *lombo* follows *mata lombo* 'the actual *lombo*,' *mata bilo* 'the short-sighted, the cross-eyed,' because the moon disk has already diminished appreciably, and *mata ntokodi* 'eye of small people.' They are all very favorable for agriculture. Then comes *rotu*, again a day when one has to stay inactive to prevent animals from destroying the crop. Then follow some good days: *kawe* 'reach out,' 'beckon,' the moon reaches almost to the zenith of the sky at the break of day (among the Poso, *kawe* is a prohibition day). *Kake*, which is two days, distinguished as *kake ntau* 'kake of people,' and *kake mbawu* 'kake of pigs.' *Lêbasi* 'fainting' of the moon, it is again declining in vigor. *Kabongo* 'grown moldy.' *Malângani* 'highly progressed,' alluding to the long, narrow shape of the moon (probably a [p. 543] shortening of *tu'a malângani* 'tall stump,' the way this day is named among the related To Ampana tribe). *Tu'a rede* 'short stump.' All these days are good for the field labor. But then follows a day, *aje* 'jawbone' (the moon is like a jawbone), which is very unfavorable for field work. The following night is called *saya mbuya* 'the moon has hidden itself,' there is nothing of it visible. On the day following this night one can work in the field. This day is even held to be the best on which to start planting or

harvesting rice. Sometimes one does not see the moon for two nights. People also call these days *kawuri mbuya* ‘the blackness of the moon.’

Especially the fifth and sixth days were selected for starting field work. For going to war, the fifth and ninth days were chosen; these are the *wuya ntuama* ‘the moons of man’ or *wuya koje* ‘the moons of bravery.’ The best was when one left home on the fifth day, and on the ninth day the enemy fell.

### ***Balantak***

From Kruyt (1934:131–132), translated by Ewald den Blaauwen.

[p. 131] When doing all these kinds of jobs, the days of the month (moon days) are taken notice of, because one should take care not to do any fieldwork on days which are prohibited to the family. The names of the days (nights) are: *gora'ion*, *kopinduana*, *torotoluna*, *taraparapaatna*, *pirilima'na*, *toronomna*, *piripitu'na*, *parawalu'na*, *pirisio'na*, *piripompulo'na*, *kama'asana*, *timumun*, *malai*, *toposuur*, *tumba*, *warani* (full moon), *kobinsiran*, *katumbe*, *kasoa*, *tumangara*, *olot*, *kumoto*, *koliu*, *ola*, *mantatar*, *tu'or*, *ole mola*, *poso*, *lalom*, *lalom*, two dark moons.

As is usually done among the peoples on Celebes, the days of the first half of the month are counted; the vowel of the ordinal prefix changes according to the vowel of the cardinal.

From these days no one specific number have been determined as prohibited times because the name of the day or a peculiarity of the position of the moon gives rise [p. 132] to it. Rather for every family the days upon which they are not allowed to work in the field are different. These are, namely, the days on which the father, the mother, or a child from that family died. If they didn't bother about them, the crop would be destroyed by pigs or mice.

### ***West Toraja***

From Kruyt (1938, IV:57–62), translated by David Mead.

[p. 57] When a piece of land is being prepared to plant rice, it is not possible to go work every day. There are days of the month, if one went to work in the field, that would carry evil consequences after themselves. These are the ‘bad’ lunar days. The names of the days are taken from the position and the phase of the moon during the night prior to the concerned day.

I have made lists of the lunar days of all the regions I have visited, and I have found that the order is not the same everywhere in the same region. Sometimes the names also differ. Where this is the case, both names are specified in the included list of the names of days. Only certain of the elderly know to answer this point; the youngsters show a great indifference to the [p. 58] days of the month, and many do not keep up with or reckon

them any more. In the Kaili group I have not been able to make a reliable list of moon days, because under the influence of Islam mainly people reckon only according to the days of the week. However, they have no significance for agriculture, but for other activities. So, people prefer to erect their house on Sinee or Sinaia (Arabic *itsnain*), Monday. Weddings are preferably done on Jumaa (*joemaāt*), Friday, or on *posumara ntodea* or *boelan tiga kali*, i.e. the third moon day. The name of the first moon day, *mata wula*, is still widely known to the Kaili group. The next day is called *wula marenge* ‘the moon is lean, weak.’ Following this the already mentioned *posumara ntodea* ‘on which the crowd is astonished’; this perhaps relates to the fact that in the Sigi and Pakawa groups, when you first see the new moon, you have to say: “Here we all are; no one is missing!” One likes to go on a journey on Salasa (Tuesday) or Araba (*arbā*, Wednesday); only people of nobility preferably depart on Kamisi (*chamis*, Thursday). These three days, Araba, Kamisi and Jumaa, are good days to go hunting.<sup>32</sup>

The names of the days, which are held everywhere to be unfavorable for agriculture, are bolded in the list. People say that when someone does field work on such a day, the harvest will be destroyed by animals (buffalo, pigs, mice, birds, insects); also that someone from the family of the owner will not experience the harvest of their field. Except for the prohibition days, which are taken into account by all, there are still days when someone will not go to the field for a special reason. Thus two of my respondents in different places named a moon day on which they did not do any field work, because on that day their grandfathers had died.

One starts counting the days with the night in which the crescent moon has been seen briefly, thus the second or third day after the new moon. The day on which the count begins is *mata wula* ‘moon day’ or *matana* ‘the day of it’; in Pakawa also called *panggita wula* ‘when the moon is seen.’ [p. 59] On this day no Toraja will do field work. If they did, pigs, mice, birds or insects would destroy their planting. In addition to this, the Koro group further claims that a person who does field work on this day will not rise from his sleeping place, i.e. die.

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<sup>32</sup> [footnote 8, page 58] Among the Kaili group the full moon is called *dongga*; only in Tawaili one says *naoge* ‘the large.’ In Palu I was given the following names of moon days: *nggalisua*, *loanga*, *pali ngguni*, but which days are meant, people could no longer say. *Nggalisua* is still well known in other regions of the Kaili group, but seems to be only a forbidden day, so that several days can be *nggalisua*.

In Tawaili an agricultural priest related that if the third moon day falls on a Tuesday, this day is *nggalisua*; So also if the seventeenth day falls on a Saturday. If the tenth day is a Monday or Wednesday, then that day is good to start all kinds of work; but if the twelfth day falls on a Thursday, then this is very bad. If the fourteenth is a Monday, it is called *mustaba*. The fifteenth, sixteenth and seventeenth days on Fridays are good; if the sixteenth day falls on a Saturday, then that is good, but if the seventeenth day is a Saturday, then that is very bad, as was already mentioned. If the eighteenth day is on a Sunday, then it is bad, also on Fridays; but if it is a Thursday, then it is good, etc. In the calculation of good and bad days people already make use of divination tables, called *kotika*, *lontara* and *palakia*. This practice has been borrowed from the Bugis.

	Tawailia	Napu	Besoa	Bada’	Rampi’	Koro group	Kulawi group	Pakawa group	Sigi group
1	<i>Mata wula</i> ‘moon day,’ animals will ruin the crop; or <i>matana</i> ‘the moon day.’	<i>Mata wula</i> or <i>matana</i> , as Tawailia.	<i>Mata wula</i> or <i>matana</i> , as Tawailia.	<i>Mata wula</i> or <i>matana</i> , as Tawailia.	<i>Mata wula</i> or <i>matana</i> , as Tawailia.	<i>Mata wula</i> or <i>matana</i> , as Tawailia; people will not arise from their sleeping mat, i.e. die.	<i>Mata wula</i> or <i>matana</i> , as Tawailia.	<i>Mata wula</i> or <i>matana</i> , as Tawailia. Or: <i>wula kimbo</i> ; or: <i>panggita wula</i> ‘if one sees the moon.’	<i>Mata wula</i> or <i>matana</i> , as Tawailia.
2	<i>Wula ura</i> ‘the moon goes somewhat aback.’	<i>Wula ura</i> , as Tawailia.	<i>Wula ura</i> , as Tawailia.	<i>Wula ura</i> , as Tawailia, or: <i>karombuana</i> ‘the second moon day.’	<i>Karo'onuna wula</i> ‘the second moon day.’	<i>Ngurana</i> ‘the one going back,’ young people and children do not work.	<i>Ngurana</i> , as the Koro group.	<i>Wula ngura</i> , as Tawailia.	<i>Ola</i> .
3		<i>Kataluna</i> ‘the third’ moon.	<i>Kataluna</i> ‘the third’ moon.	<i>Kataluna</i> , as Besoa.	<i>Katolu nu wula</i> , as Besoa.	<i>Tepu'una</i> , ‘the start’ of the counting, or: <i>ko'ona</i> ‘be strong’ of the moon.	<i>Koona</i> ‘it is strong’ of the moon.	<i>Wula nggiki</i> ‘the moon bites.’	<i>Ruanggani wula</i> ‘for the second time moon.’
4		<i>Kaibana</i> ‘the fourth’ moon.	<i>Kaibana</i> ‘the fourth’ moon.	<i>Kaibana</i> , as Besoa	<i>Kaiba nu wula</i> , as Besoa.	<i>Karuonguna</i> ‘the second’ of <i>ko'ona</i> .	<i>Karoonguna</i> , as the Koro group.	<i>Kiki kaupu</i> ‘the last kiki.’	<i>Tolunggani wula</i> ‘for the third time moon.’
5		<i>Kalimana</i> ‘the fifth’ moon.	<i>Kalimana</i> ‘the fifth’ moon.	<i>Kalimana</i> , as Besoa.	<i>Kalima nu wula</i> , as Besoa.	<i>Katoluna</i> ‘the third.’	<i>Katoluna</i> , as the Koro group.	<i>Wula toluongu</i> ‘third moon.’	<i>Patanggani wula</i> ‘for the fourth time moon.’
6		<i>Kainina</i> ‘the sixth’ moon.	<i>Kainina</i> ‘the sixth’ moon.	<i>Kainina</i> , as Besoa.	<i>Kaēni nu wula</i> , as Besoa, or <i>himbo'na</i> , first quarter or <i>humbo'na</i> ‘at the zenith’ at sunset the moon is located at the zenith; also <i>humbo'na molea</i> , young <i>humbo'na</i> .	<i>Kaopona</i> ‘the fourth.’	<i>Kaopona</i> , as the Koro group.	<i>Wula pataongu</i> ‘fourth moon.’	<i>Alimanggani wula</i> ‘for the fifth time moon.’
7	<i>Sumamboka</i> ‘entirely split in two.’	<i>Kapituna</i> ‘the seventh’ moon.	<i>Kapituna</i> ‘the seventh’ moon.	<i>Kapituna</i> , as Besoa.	<i>Kapitu nu wula</i> , as Besoa; or: <i>dodoa</i> ‘the second’ of <i>himbo'na</i> ; or: <i>porēda ngkoi</i> .	<i>Kalimana</i> ‘the fifth.’	<i>Kalimana</i> , as the Koro group.	<i>Wula lalima</i> ‘fifth moon.’	<i>Ononggani wula</i> ‘for the sixth time moon.’
8	<i>Linduna</i> , the quiet waxing of the moon.	<i>Kauualuna</i> ‘the eighth’ moon.	<i>Kauualuna</i> ‘the eighth’ moon.	<i>Kauualuna</i> , as Besoa.	<i>Kauwalu nu wula</i> , as Besoa; or: <i>mata porēda</i> ‘true <i>porēda</i> ’; or: <i>porēda ahu</i> ‘dog’s head’ ( <i>porēda</i> ‘head,’ because the moon forms half of a small (dog’s) head.	<i>Kaonona</i> ‘the sixth.’	<i>Kaonona</i> , as the Koro group.	<i>Wula aono</i> ‘sixth moon.’	<i>Papitunggani wula</i> ‘for the seventh time moon.’
9	<i>Linduna</i> , as above.	<i>Kahahiona</i> ‘the ninth’ moon.	<i>Kahahio'na</i> ‘the ninth’ moon.	<i>Kahahio'na</i> , as Besoa.	<i>Poreda ngkēi</i> ‘large head.’	<i>Kapituna</i> ‘the seventh.’	<i>Kapituna</i> , as the Koro group.	<i>Wula papitu</i> ‘seventh moon.’	<i>Ualunggani wula</i> ‘for the eighth time moon.’
10	<i>Linduna</i> , as above.	<i>Kahampulona</i> ‘the tenth’ moon.	<i>Kahampulo'na</i> ‘the tenth’ moon.	<i>Kahampulo'na</i> , as Besoa.	<i>Roronda</i> ‘pulled out,’ from the horizon, at sunset.	<i>Kauualuna</i> ‘the eighth.’	<i>Kauualuna</i> , as the Koro group.	<i>Wula ualu</i> ‘eighth moon.’	<i>Sasionggani wula</i> ‘for the ninth time moon.’
11	<i>Linduna</i> , as above.	<i>Wua waa ahu</i> ‘dog’s head’ ( <i>wua</i> and <i>waa</i> are here possibly confused with each other).	<i>Wua ahu</i> ‘dog’s head.’	<i>Wula boe</i> ‘pig’s moon’; pigs will ruin the crop.	<i>Pombehehe</i> of <i>pomehehe</i> ‘quarrel’; animals come argue of the crop, who will eat it; also <i>lengka</i> .	<i>Kasiona</i> ‘the ninth.’	<i>Kasasiona</i> , as the Koro group.	<i>Wula sasio</i> ‘ninth moon.’	<i>Sampulunggani wula</i> ‘for the tenth time moon.’

	Tawailia	Napu	Besoa	Bada’	Rampi’	Koro group	Kulawi group	Pakawa group	Sigi group
12	<i>Linduna</i> , the quiet waxing of the moon.		<i>Lengka</i> .	<i>Wula (woa’)</i> <i>ahu tu’ana</i> ‘dog’s moon for the nobility’; only noble people may perform field work.	<i>Ana’na</i> ‘its child,’ or the lesser of the previous days; or: <i>kambora</i> , <i>kamora</i> ‘say something’; upon waking the moon is still to be seen, and people say ‘it is still there.’	<i>Kahampuluna</i> ‘the tenth.’	<i>Kahampuluna</i> , as the Koro group.	<i>Wula sampulu</i> ‘tenth moon.’	<i>Takaloe</i> ‘hanging stuck.’
13	<i>Simaliogu</i> ‘entirely round.’	<i>Kabadaa</i> ‘the yellow moon,’ or: <i>da mohanga wula</i> ‘the moon carries no name.’	<i>Tinambu</i> ‘rest on something (the horizon)’ as the sun sets; people say: <i>mopaliu tokui</i> ‘the mice have their way.’	<i>Wula ahu kabilaha</i> ‘dog’s head of the middle class’; or <i>mararampu</i> ‘gathered’; the mice with gather in the field.	<i>Hinana</i> or <i>hunana</i> .	<i>Rono</i> or <i>laorono</i> ; Winatu: <i>ngkero</i> ; Gimpu: <i>gero</i> .	<i>Kaeoha</i> ‘bright as the day’; or: <i>nsumaongu</i> (Lindu) ‘perfectly round’; animals will destroy the planting, if one works.	<i>Dongga</i> ‘reaches full size’; pigs will destroy the planting, if one works then.	<i>Dongga</i> , as Pakawa.
14	<i>Lengka</i> .	<i>Mata warani</i> ‘the true burning day’; or: <i>alo makara</i> ‘hard day.’	<i>Huka</i> ‘measure’ (the moon has the measure, is full); the mice are already busy seeking food (even after sunset); people say: <i>mopaliu tauna</i> ‘let the people have their way.’	<i>Himpalai</i> ‘one going,’ with the sun; ‘at the same moment as each other,’ so that as the sun rises, the moon goes away.*	<i>Ngkē’emu</i> , the rice is warm, so that the leaves wither. Or: <i>hingko’omu</i> .	<i>Himpalai</i> , as Bada’.	<i>Simpalai</i> , as Bada’; or: <i>kawunia</i> ‘whereupon the moon hides,’ before it rises. People connect this ‘hiding’ to pigs and mice, which now come to destroy the field.	<i>Sampalai</i> ‘momentarily,’ the moon rises just as the sun sets.	<i>Simpalai</i> , as Bada’; or: <i>njisi</i> .
15	<i>Pokunia</i> ‘whereupon the moon is yellow.’	<i>Warani kaia</i> ‘great warani’; others: <i>mata warani</i> .	<i>Mata warani</i> ‘true burning day’; people are at home as the moon rises. People may well plant bananas but no rice; no barn building. Also: <i>tekai’</i> .	<i>Tekai’</i> ‘restrained’; the moon does not arrive immediately after sunset. A good day: the vitality of the rice is prevented from leaving the crop.	<i>Hode’</i> or <i>hohode’</i> or <i>hode’na</i> ‘segment’; a segment of the full moon is darkened.	<i>Warani</i> , as Besoa; many mice come to the field.	<i>Tumaka kodi</i> ‘small <i>tumaka</i> ,’ whereupon the moon is still a little stuck at sunrise.	<i>Tumaka bete</i> ‘great <i>tumaka</i> ’; as Kulawi; or: <i>takaloe</i> ‘hanging stuck.’	<i>Tumaka</i> ‘the moon is still somewhat fixed in the sky.’
16	<i>Petambu</i> ‘lying on (the mountain),’ at sunset.	<i>Tulu</i> ‘at the zenith,’ at sunrise; animals will attack the crop. Others: <i>warani kaia</i> ‘great warani.’	<i>Warani ngka’ia</i> ‘great warani.’ Others: <i>mata warani</i> ‘warani day.’	<i>Mata warani</i> ‘warani day.’	<i>Mata wurani</i> or <i>wurani</i> ‘wurani day,’ or: <i>koro’o nu hode’</i> ‘the last <i>hode’</i> ’; all sorts of animals come into the field.	<i>Tumaka</i> ‘the moon is still a little stuck.’	<i>Tumaka bose</i> ‘great <i>tumaka</i> .’	<i>Tumaka kei</i> ‘small <i>tumaka</i> ,’ or: <i>bani nggara</i> ‘hard night.’	<i>Tumaka</i> ‘the moon is still somewhat fixed in the sky.’
17	<i>Warani</i> ‘burning.’	<i>To kakaia</i> ‘the moon is still somewhat big.’	<i>Tokaka’ia</i> , as Napu; others: <i>warani kaia</i> .	<i>Warani ka’ia</i> ‘great warani.’	<i>Wurani ngkēi</i> ‘great wurani’; or: <i>karo’o nu wurani</i> ‘the last wurani.’	<i>Humua</i> ‘the moon begins to set.’	<i>Sumua</i> , as the Koro group; all sorts of animals come inside ( <i>sua</i> ) the field.	<i>Bani malulu</i> ‘the soft night.’	<i>Tumaka kaupū</i> ‘the last <i>tumaka</i> .’
18	<i>Warani ngkaia</i> ‘great burning.’	<i>Mangkalehi</i> : various animals attack the crop.	<i>Rungu pehangku</i> ‘beginning of the <i>pehangku</i> ’ (having the form of a landing net).	<i>Hura</i> ‘sitting.’	<i>Lengka</i> ‘move aside’; at sunrise the moon has been pushed past the zenith; or <i>koro’o na dodoa</i> ‘what comes after the two <i>wurani</i> days.’	<i>Nggake lompe</i> ‘good <i>nggake</i> ’; or: <i>nggau</i> .	<i>Mangkake</i> or <i>tai wula</i> (Kulawi) or <i>toteina</i> (Lindu), all is muck ( <i>totei</i> ), nothing accrues, if one works in the field.	<i>Wula mpadondo</i> ‘moon of the morning.’	<i>Wula olo</i> ‘a moon day in between.’
19	<i>Mangkalahi</i> : all kinds of animals attack the crop.	<i>Hura</i> ‘sitting.’	<i>Karumbua pehangku</i> ‘the second <i>pehangku</i> .’	<i>Mangkalehi</i> ; people make this word synonymous with <i>mokadakehi</i> ‘damage’; many birds will eat the rice.	<i>Humbo’na</i> , <i>himbo’na</i> , last quarter; in contrast with 6, <i>himbo’na motodi</i> ‘old <i>himbo’na</i> .’	<i>Nggake hupu</i> ‘the last <i>nggake</i> ’; or: <i>kahupu anu nggau</i> ‘the end of <i>nggau</i> .’	<i>Kageroa</i> ‘destruction’; if one works on this day, one will even die of an insignificant wound.	<i>Keketongo</i> .	<i>Ta’ina</i> , all sorts of animals come to do their business ( <i>ta’i</i> ) in the field and go away; in other words, destroy the field.

\* Dr. S. J. Esser remarks concerning *himpalai*: Perhaps people think herewith of ‘going away from each other’ (Sigi *nohimpalai*), because according to a girl from Palolo, people would also say of the new moon: *pohimpalai (nu) wula*, thus meaning: *nohimpalai nte tinana* ‘going away from its mother,’ because it no longer sojourns in the east with its mother (the previous dead moon) (the night of the dark moon), but has become visible in the west. Also on the fourteenth moon day, the name could then refer to the fact that the one is visible in the east and the other in the west.

	Tawailia	Napu	Besoa	Bada'	Rampi'	Koro group	Kulawi group	Pakawa group	Sigi group
20	<i>Dadoa</i> 'the second' of <i>pehangku</i> .	<b>Kageroana</b> 'the destruction' of the field, if one works therein on that day.	<i>Rungu moiho</i> 'the first <i>moiho</i> ,' that is, 'packed together.'	<i>Lengka</i> .	<b>Tohampedeai</b> 'what (at sunrise) has nearly reached (the zenith).'	<i>Tepu'u tulu</i> 'start of <i>tulu</i> '; that is, last quarter. At Winatu people say that fingers and toes will fall off if one works.	<i>Lompe saongu</i> 'the first good (?) day.'	<i>Tiro wobo</i> 'look down on the door opening'; at morning the moon illuminates the portal of the house.	<i>Kageroana</i> , as Napu.
21	<b>Kawe</b> 'beckon': all animals are beckoned to the field.	<b>Dadoa kegeroana</b> 'the second <i>kageroana</i> ,' or 'destruction.'	<i>Karumbua moiho</i> 'the second <i>moiho</i> ,' that is, 'packed together.'	<i>Tulu</i> 'at the zenith,' last quarter.	<b>Mata kawe</b> 'the principal <i>kawe</i> '; the rice soul is beckoned away. Others: <i>tohiluawe</i> 'what at sunrise is on the other side (in the middle between earth and zenith).'	<i>Kahupu'ana tulu</i> 'the last <i>tulu</i> '; or: <i>karoonguna</i> 'the second <i>tulu</i> .'	<i>Lompe karoonguna</i> 'the second good (?) day.'	<b>Ta'i</b> , see 19th day of the Sigi group.	<i>Aya nu mboa</i> 'snare (Bare'e <i>aja</i> ) of the spirits.'
22	<b>Kagerona</b> 'destruction'; the harvest will fail if one works.	<b>Kawe</b> 'beckon'; according to some the rice soul is beckoned away. Others: all fortune is beckoned closer.	<i>Kawe</i> 'beckon.'	<i>Mata kawe</i> 'principal <i>kawe</i> '; or: <i>kawe maro'a</i> 'good <i>kawe</i> .'	<i>Karo'o nu kawe</i> 'the last <i>kawe</i> '; or: <i>mata tokoeo</i> 'principal <i>tokoeo</i> '; others: <i>mata kawe</i> .	<b>Kawe</b> 'beckon': all sorts of animals come to the field; ' <i>kawe</i> sees death.'	<i>Lompe katoluonguna</i> 'third good (?) day.'	<i>Tolagi mate</i> .	<i>Maiso</i> 'packed together.'
23	<b>Patoana</b> 'the moon is only a stump ( <i>toa</i> ).'	<i>Nguduna</i> 'the moon is already rushed'; or: <i>moiho</i> 'packed together.'	<i>Dadoa</i> 'the second' <i>kawe</i> .	<b>Karombua kawe</b> 'second <i>kawe</i> '; or: <b>kawe ngkadake</b> 'bad <i>kawe</i> .'	<i>Mata mo'eho</i> 'principal <i>mo'eho</i> ,' that is 'packed together'; or: <i>koro'o tokoeo</i> 'last <i>tokoeo</i> .'	<b>Dadoa</b> 'the second' <i>kawe</i> ; as the first.	<i>Lompe kaopona</i> 'fourth good (?) day.'	<b>Lelewata</b> '(the moon-light) brushes over the lying trunks'; the rice will be as dead as the trunks.	<i>Ruanggani maiso</i> 'for the second time <i>maiso</i> .'
24	<i>Wula rera</i> .	<i>Nguru moiho</i> 'the first <i>moiho</i> '; for others: <i>karuogu moiho</i> 'the second <i>moiho</i> .'	<b>Kagerona</b> 'the destruction'; for others: <i>rungu moiho</i> 'the first <i>moiho</i> .'	<i>Mata moiho</i> 'first <i>moiho</i> ,' that is, 'packed together.'	<i>Mo'eho ngkēi</i> 'great <i>mo'eho</i> '; for others: <i>mata mo'eho</i> .	<i>Tepu'u pirini</i> 'start of <i>pirini</i> ,' that is, 'blind.'	<i>Lompe kalimana</i> 'fifth good (?) day.'	<i>Pokeke</i> 'digging stick' (with which among other things tubers are excavated).	<i>Tolunggani maiso</i> 'for the third time <i>maiso</i> .'
25	<i>Wula labe</i> .	<i>Kaopea moiho</i> 'the end of <i>moiho</i> .'	<i>To'ana</i> 'the moon is only a stump'; for others: <i>karumbua moiho</i> 'the second <i>moiho</i> .'	<i>Karombua'na moiho</i> 'second <i>moiho</i> .'	<i>Mo'ohi</i> or <i>mo'ihu</i> 'the moon has another form'; for others: <i>koro'o nu mo'ihu</i> 'end of <i>mo'ihu</i> .'	<i>Karuongu prini</i> 'second <i>pirini</i> .'	<i>Lompe kaonona</i> 'sixth good (?) day.'	<i>Nalompe</i> , the moon is 'good.'	<i>Patanggani maiso</i> 'for the fourth time <i>maiso</i> .'
26		<b>Patoana</b> 'the moon is only a stump.'	<i>Tehusu</i> 'taken away.'	<i>Kataluana moiho</i> 'third <i>moiho</i> '; or: <i>kaupuana moiho</i> 'last <i>moiho</i> .'	<i>Moihi</i> 'it has contents, that is, the moon is still well visible.'	<i>Kahupuna pirini</i> 'last <i>pirini</i> '; or: <i>pancapu</i> 'denial'; some say the moon no longer shows.	<i>Lompe kapapituna</i> 'seventh good (?) day.'	<b>Wula mate</b> 'the moon dies' (is approaching death).	<i>Alimanggani maiso</i> 'for the fifth time <i>maiso</i> .'
27		<b>Wula lalu</b> 'dark moon.'	<i>Lalu</i> 'inside,' that is, darkness.	<i>Toa' tokararu</i> or <i>toa' tomapangku</i> 'the moon is yet a long or tall stump.'	<b>Ti'ina</b> 'the moon is but a stick ( <i>ti'i</i> '); plants become like sticks, without fruit, if one works then.	<b>Hura</b> 'sit'; one will suffer much from mice if one works then.	<b>Sura</b> 'sit'; the child of a field worker will die, before it can sit, if one works in the field now.	<i>Sore</i> 'taken inside.'	<i>Nehuamo wula</i> 'the moon has gone inside.'
28		<i>Sua</i> 'the moon has entered ( <i>sua</i> ).'	<i>Hua</i> 'the moon has entered.'	<i>Toa' toraremba</i> 'the moon is yet a short stump.'	<i>Kahiropuana</i> 'annihilation' of the moon.	<b>Poho</b> 'broken piece'; nothing of what is planted will thrive.	<b>Suana</b> the moon 'goes inside'; or: <b>tehuncu</b> the moon lies on the eastern horizon at sunrise.	<b>Kaposo</b> 'broken piece'; the eyes will break ( <i>kaposo mata</i> ), become blind, if one works then.	<i>Rara mainti</i> , as the 29th day of the Kulawi group.
29		<i>Olona</i> 'between day,' between old and new moon.	<i>Pantaolo</i> 'between day.'	<i>Tehusu</i> 'taken away.' <i>Rarono</i> or <i>ilalu</i> 'inside,' thus dark.	<i>Wula rindina</i> 'dark moon.'	<i>Lara, rara, rala</i> 'inside.' — <i>Olona</i> 'between day'; or: <i>lumawa</i> .	<i>Rara mainti</i> , perhaps: 'just always remaining inside,' in connection with the fact that people wait in vain all night long for the moon.— <b>Olona</b> 'between day'; animals destroy the planting	<i>Magero</i> 'annihilated.'	

The second moon position is *wula ura* in Lore, elsewhere *wula ngura*. These names mean that the moon proceeds late or slow (*ura*), i.e. not so quickly after the sun goes down. In the western tribes, the name is associated with *ngura* 'young'; it would then mean 'young moon.' In Lore it is considered as a day which may be devoted to field work, but in the other tribes, in connection with the erroneous explanation of its name, it is considered dangerous for young (*mangura*) people and people who have young children, because one of these could easily die during the agricultural year. Only older people will risk venturing to the field on this day. The position accorded to this day in the list of Adriani & Kruyt 1, volume II, page 268 is incorrect.

*Wula ura* or *wula ngura* is also called 'the second' moon day, and one continues to count them sometimes up to full moon, sometimes up to a few nights before full moon. Only the To Rampi' use a number of names in this period, which I cannot explain. In the Koro and Kulawi groups, one speaks of those days as *koona* or *ko'ona* 'its strength,' i.e. the moon the longer the more solid it becomes. The To Pakawa call the third and fourth moon phase *kikina* 'the stinging or biting of the moon'; presumably this name is related to the sharpness that the crescent still has. In Tawailia these days are called *linduna*, with which is intended the quiet, still (*lindu*) waxing of this celestial body. Only in this region and in Rampi' did I hear a name for first quarter: *sumamboka* 'completely split, divided in two,' namely the moon; and *himbo'na*, which has the same sense.

During this period there are no days in which it is forbidden to work in the field. One would expect the waxing moon to have a beneficial effect on all field work. It is only when days are no longer named using ordinal numbers prior to the full moon, and people give the moon phases proper names, that the days so named are forbidden for doing field work.

In Lore and Rampi' the name *lengka* occurs for a moon phase shortly before or shortly after the full moon. This word has the significance of 'moving,' but what people think thereby with respect to the moon, I do not know. In Besoa a moon phase is called *wula ahu* 'dog's moon,' which in Bada' is called *wula boe* 'pig's moon.' Following this is the *wula ahu*, which is differentiated into *wula ahu tu'ana*, on which it is lawful for those who belong to the nobility (*tu'ana*) to work in the field, and *wula ahu kabilaha* 'dog's moon for the middle class,' usually named *mararampu* 'gathered,' that is, the full moon.

The full moon is indicated by different names: *simaliogu* [p. 60] 'completely round' (Tawailia); *kabadaa* 'all yellow,' or *da mohanga wula* 'the moon bears no name' (Napu); *tinambu* 'what is laid on something,' i.e. the moon is on the horizon as the sun sets (Besoa); *marampu* 'gathered,' all together, full (Bada'); people related this 'gathering' to the animals, who do damage to the rice, and who gather on full moon days to make an attack on the field; *hinana* or *hunana* 'become finished,' that is, full (Rampi'); in the Koro group (also in Kulawi) people generally speak of *rono*, sometimes (at Karangana) *laorono*. *Merono* is 'come look at the round dance,' presumably the name refers to the fact that early in the morning, when life starts again, the moon is still there to look at. At Winatu people say *ngkero* and at Gimpu *gero* 'separate, loosen,' words that presumably indicate the negation of darkness through the full moon. Among the Kulawi

group the full moon is called *kaeoha* ‘bright as the day,’ or *nsumaongu* (Lindu) ‘perfectly round.’ Among the Pakawa and Sigi groups one says *dongga* or *dongka* ‘arrived,’ i.e. its total size reached.

Everywhere among the West Toraja no work is done in the field on this day. If one did not observe this, then what was planted would be destroyed by animals. Among the Koro group people are also known to say that the owner of the field that is being worked on this day, or his spouse, will not experience the harvest, for “*rono* (full moon) sees death.”

The days of the waning moon carry a great variety of names. During this period occur the majority of days on which the field cannot be worked. This shouldn’t surprise us, because unlike the waxing moon, the waning moon is thought to have an adverse effect on daily life. Some things are conspicuous to us when comparing the names to each other. Thus most of the names are found among all groups, but they are not always given to the same day. Also, sometimes the data from the same region are not consistent; where differences exist I have entered both names. My current data differs from those we gave in earlier years (Adriani & Kruyt, 1, volume II, page 268a). It must be inferred that the order of the days was originally the same, but that it has been confused by arbitrary application.

Sometimes one group attributes an adverse influence to a day, which is favorable to another group. It is also noteworthy that in Besoa and Bada’ so few days are considered unfavorable. As far as the first region is concerned, this could be a result of the inhabitants’ long stay in the Palu valley (see chapter I, sections 199, 200). Among the To Bada’, the significance of the days for agriculture during the mourning period may in general have weakened the retention of the unfavorable nature of certain lunar days (see chapter XIV, section 51).

Here are just a few remarks about commonly used names: *himpalai* or *simpalai* ‘on the same moment of each other,’ often abbreviated to *himpa*, is the name given by many tribes to the day after the full moon day, because [p. 61] as soon as the moon sets, the sun comes up. This day is generally considered to be unfavorable for agriculture.

*Warani*. This word is not synonymous with Malay *berani*, as used in *taliwarani* ‘the brave,’ that is to say, the war spirits. Rather it is derived from *wara* ‘burning,’ in connection with the fact that the light of the moon is still strong.

*Tumaka* ‘a little stuck’ of the moon, i.e. at the break of day the moon is not yet set, it is still stuck in the sky. *Takaloe* ‘hanging stuck’ has the same sense, i.e. at sunrise the moon still hangs in the sky. Among the Sigi group the day for full moon day is called *takaloe*; if this is not a consequence of a shift of names, then herewith is indicated that at sunset the moon already hangs a little on the eastern sky.

*Tulu* ‘at the zenith’; at sunset [sic → sunrise] the moon is at the zenith. This is the appropriate name for ‘last quarter,’ as is the case in Bada’. But in Napu we see this name already given to a day shortly after full moon. In this *tulu* one thinks of an ‘egg,’ which is also called *tulu*, and then the following explanation is given why it is forbidden to work

on this day in the field: because then the rice birds would put eggs in the field, with the consequence that one should suffer much trouble from this rice thief. *Tulu* is a bad day in Napu, but in Bada' a good one.

Across Celebes *kawe* is an oft-encountered name for a moon day. *Kawe* means 'beckon,' make a motion with the hand to draw someone toward oneself; also: reach toward something to grasp it. The moon is not yet at the zenith when the sun rises on this day, but it reaches toward the highest point in the sky, as someone who wants to take something from a higher place, but cannot. When we investigate where *kawe* appears in the lists of moon days, we see that this name is mostly in its correct place. Among most groups *kawe* is a forbidden day for agriculture; by working on this day, one 'calls' animals, which do damage to the crop. In Rampi' it is said that on that day the life force (*tanuana*) of the rice is 'beckoned,' so that it goes away. The To Bada' distinguish a good and a bad *kawe*: on the first, all happiness is 'beckoned' to the field, on the second the life force of the crop is 'beckoned,' by which it is rendered powerless and is given over to all influences, which do it evil.

Concerning the moon day called *tekai* 'restrained,' it is not altogether certain whether it has a good or an evil influence on the crop. This depends on whether one has the view that good fortune is restrained, so that the farmer cannot obtain it, or that fortune is restrained in the field, so that it cannot be removed from it, so that it is blessed.

Another oft-encountered name for a moon day is *kageroana* [p. 62] 'the annihilation' of the moon. The place that this day occupies in sequence is not always the same; naturally it only occurs during the time that the moon is very diminished in size. The name already indicates that this day is unfavorable for field work, because the crop will then be destroyed in some way.

Contrary to the idea that a number of moon days have a bad influence on the field, on other days a very positive influence is expected in one way or another. The Koro group believe that the days of *karuongu pirini* are particularly beneficial for planting rice. To erect a house, it is preferable to choose *humua*; to go on a trip *lumawa*. Formerly when people went to war, one left home on *kagerona*, because it was believed that one would then destroy a village of the enemy, a belief shared by all tribes. Also in Bada' the last days of the month (*toa' tokararu*, *toa' torarembé*, *tehusu*, *raronó*) are very good to plant rice; people say then that the sun and moon copulate, and that thereby great fertility in nature arises. In this land the following are named appropriate days for burning felled wood in the garden plot: *mata moiho'* and *karombua'na moiho'*. In Rampi' people arrange to have a marriage on *ana'na*, *hohode'*, *himbo'na*, *roronda*, *tohampedeai*. In this way one could continue to name each of the days that are appropriate locally for a particular activity.

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