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OPEN RIVERS :  
RETHINKING WATER, PLACE & COMMUNITY

# RELATIONALITY

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An interdisciplinary online journal rethinking the Mississippi  
from multiple perspectives within and beyond the academy.

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FEATURE

# RATTLESNAKE EFFIGY MOUND ANCESTORS STILL TEACHING

By Jim Rock

*For centuries “science” has been thought of, taught, and practiced in a particular pattern and model, with its origins in European philosophical traditions. Things that were not science were story, or anecdote, or folklore, lesser forms of knowledge somehow. Currently this western orientation of science has tremendous cultural power; just think of all the times policymakers say they “follow the science.”*

*But what if we understood science differently, as an explanation of biological or physical phenomena that was grounded in observation and testing/confirmation, but that wasn’t written down in official journals, but was rather conveyed orally over generations? A global movement of Indigenous and Western-trained astronomers is posing that very question. One project, *Native Skywatchers*, includes collaboration with Indigenous astronomer Jim Rock, the*



*Rattlesnake. Image courtesy of Duncan Sanchez.*

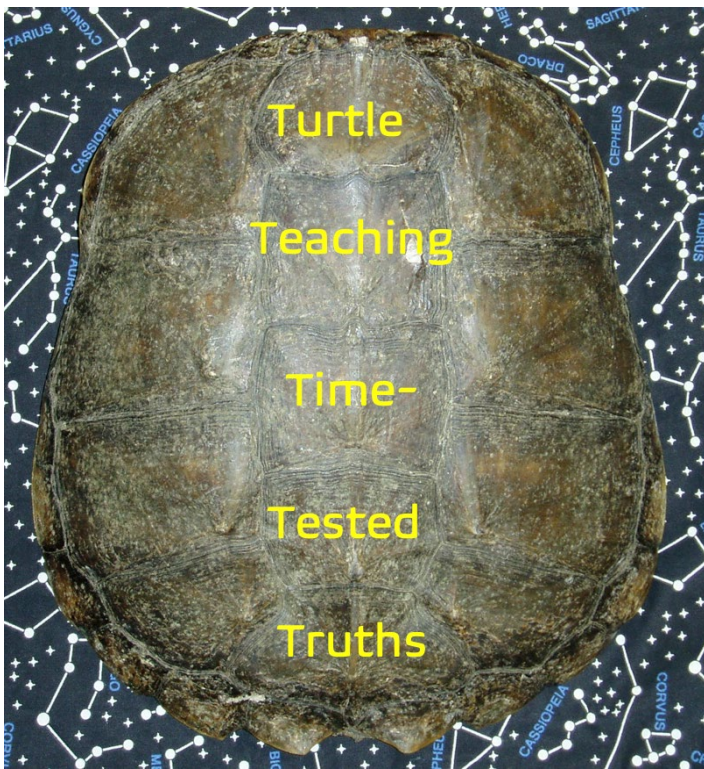
author of this feature. Rock's writing exemplifies a nonlinear, multi-modal way of conveying knowledge that some would argue is an essential part of knowing the world in new ways, ways

critical to meeting the enormous challenges we face.

– Patrick Nunnally, St. Paul, MN

# Keya Wita Akan Pahá Zuzéča K'a Hupkake Kiŋ Henáh \*Wówičakhe\*\* Waúŋspewičhakiyiy Kta Čhín

## KWAPZ(KH)<sup>2</sup>W<sup>2</sup>KČ (13)



TTTTT ☆ ☆ ☆ ☆ ☆

## REM(A/A) OTIST S-TK\*&IAG\*\*T (16)



# Rattlesnake Effigy Mound Ancestors at Afton of Turtle Island Still Teaching Spacetime-Tested\* (and) \*\*Truths

\* Kapemni

\*\* IAG, Indigenous Astro-Geographical

Seeing Snake’s head, tail & body joined together as a one-eyed, Cyclopean Wakinyan

(Thunderbird) sees 16 Wičháhŋpi (Stars) in Dakota Zuzéča (Snake) Constellation: Head ¶ + 3 Tail ¶¶¶ + 12 Body ¶¶¶¶¶¶¶¶¶¶¶¶¶¶ = 16 ¶¶¶¶¶¶¶¶¶¶¶¶¶¶

## The Snake’s Head ¶¶

“Power plus place equals personality,” said Vine Deloria Jr., whose father mentored and baptized my Dakota father, who was **Dekši** Vine’s friend to the end. So first, “**Óhiŋniyaŋ Tákuškaŋškaŋ k’a Mihúŋkake k’a Mitákuyepi, mičhaŋté waštéya etáŋ pidámaya yedo. Wičhoni mitháwa wópida taŋka!**” It is with deepest heartfelt gratitude that I give thanks for life to the Always Moving Power who moves what moves, to the ancestors, elders, mentors, relatives and beings in Dakota homeland of

my birth where the sky reflects the waters. Great thanks for helping me feel, hear, see and write about these sacred places, such as **Bdote, Wakaŋ Tipi** and **Hoǵáŋ Owáŋka Kiŋ** of **Mni Sota Makoče. Mahásaŋni Biidabinokwe, waniyetu wikčemna sám zaptaŋ pidamaya yedo!** I also acknowledge and say thank you to my “other skin,” “First Light of Day Woman,” for 15 winters together.



## The Three Tail Shakers ¶14, ¶15, ¶16 (or sequentially ¶12, ¶13, ¶14)\*

Rock and Gould (2018) initially described REMA (Rattlesnake Effigy Mound at Afton) within “Indigenous Riverscapes and Mounds: The Feminine Relationship of Earth, Sky and Water.” In the two years since, an improved perspective has emerged to explain why the numbers work even better to tell the symbolic story in decolonized Dakota units of **wičišpa**, pronounced “weecheeshpa” and measured as Dakota cubits instead of English feet, of course!

The Snake mound was first measured by Lewis (in 1883) twenty years, or only one generation,

after the Dakota exile. He recorded the snake was a total of 534 feet from head to tail, with a head length of 88 feet, the body of 390 feet, and the shaker tail as three mounds totaling 56 feet (18, 18 and the final end mound of 20 feet, see figures 4 and 5). But if the body is actually 266 Dakota **wičišpa** (cubits), then it better represents the number of days we spend connected by our umbilical cord for 9 moons, in mom’s growing belly upon **Turtle Island Mother Earth!** So these aren’t just burial, but birth mounds. In this case, a snake may represent an umbilical cord (**čekpa**).



Also in this journal is an article titled “Sky Watchers, Earth Watchers...” which lengthened to 1,862 words, or 7 x 266! If words were years, 1862–63 was our Dakota exile. We return to this idea later where 7 x 38 = 266 cubits or days in the snake body.\*\* Therefore, the author believes this flood-watching and eclipse-watching snake effigy mound is intended to be read as a symbolic, umbilical cord between Earth and Sky. It also joins suns and moons with an amazing ability to predict certain eclipses with 99.97% accuracy. This riverside sandbar site, “**Hoǵáŋ Owáŋka Kiŋ** is the Fish Campsite (see figures 6, 7, and 8). Before

the author acronymized the snake mound as REMA, ancestors may have called it **Pahá Zuzéča Siŋté Ĥda** (PZSĤ, Rattlesnake Mound) as a form of homage to **Uŋktehi** who rules the waters and aquifers. REMA, like the Greek *rhēma* (ῥῆμα), is an utterance or spoken word or logos (λόγος). “What is REMA saying in **Zuzéča iyápi uŋ wičhóiyē** (snake speech)?” Harry Potter is a Parselmouth with Parseltongue ῥῆμα REMA speech of the Basilisk Serpent. But our **Pahá Zuzéča Siŋté Ĥda** is ten times larger than a Basilisk! 1 Head ¶ + 3 Tail ¶ ¶ ¶ = 503 words in 4 ¶ ¶ ¶ ¶ so far!

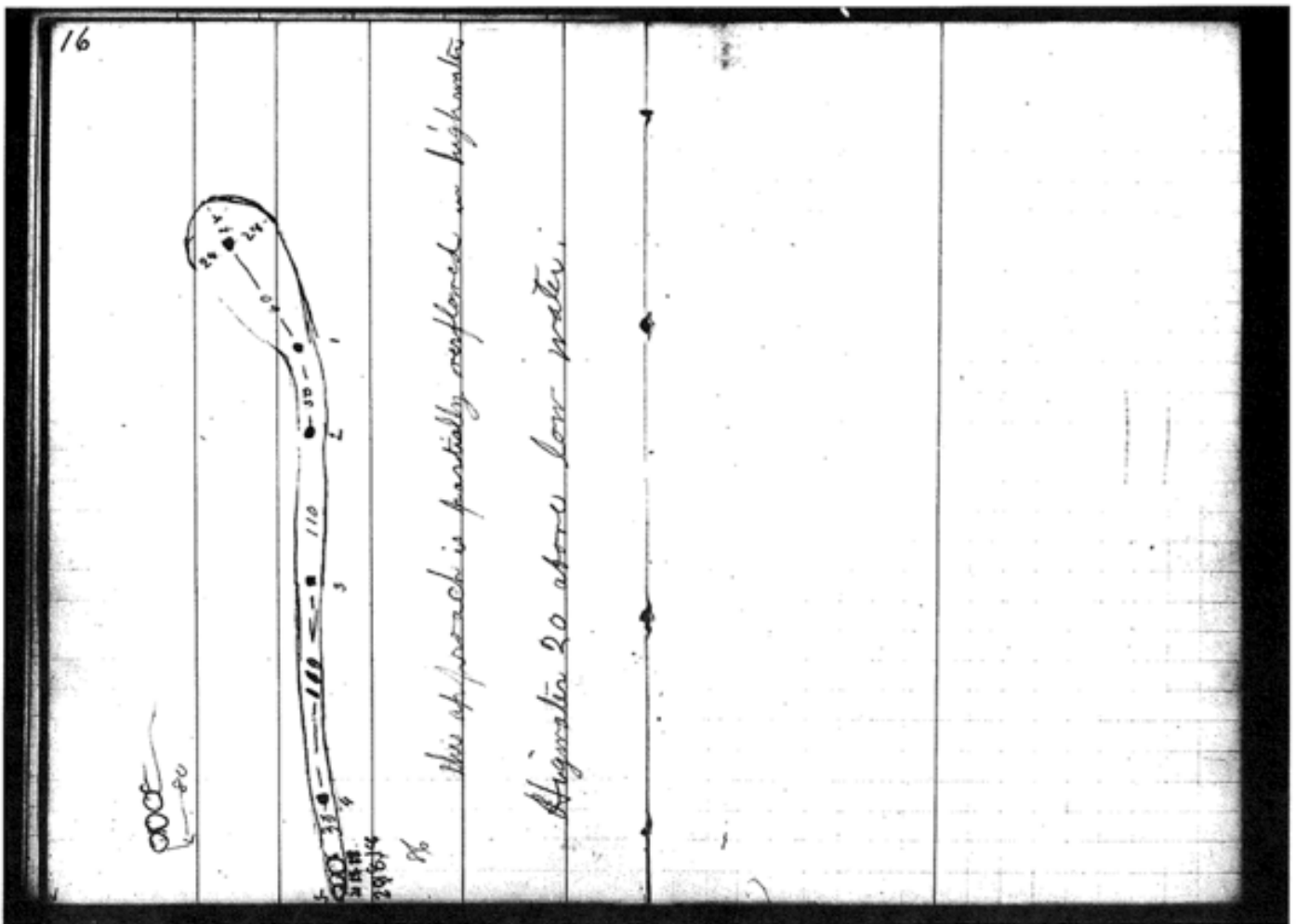


Figure 4: Detail from Lewis, T. H. (1887). *Science* 9 (220): 393–94 [Measurements from 6-25-1883 journal, pp. 15–16].





Figure 5: Detail from Lewis, T. H. (1887). *Science* 9 (220): 393–94 [Measurements from 6-25-1883 journal, pp. 15–16].

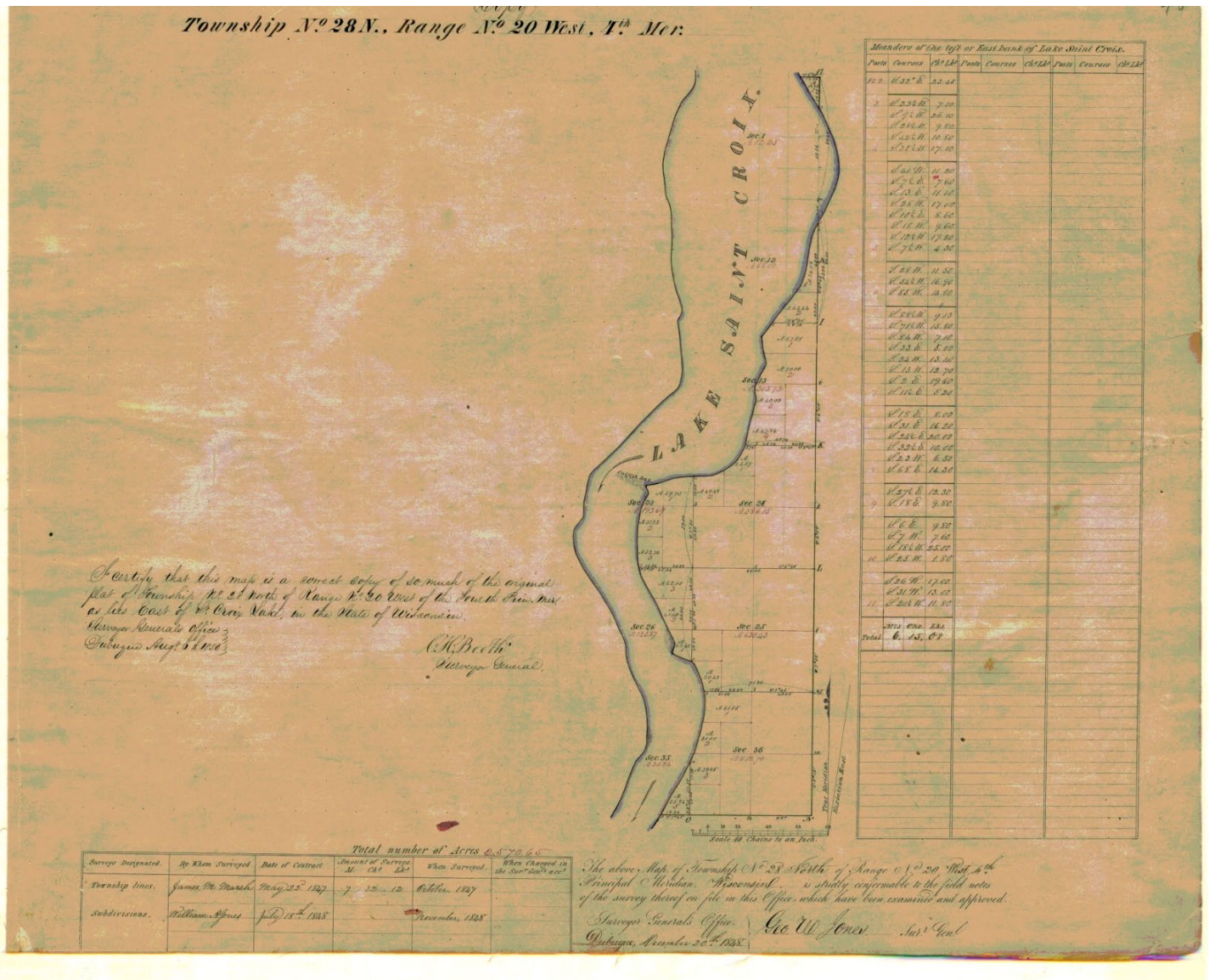


Figure 6: Wisconsin Township No. 28 N. Map 1850. Surveyor General's Office 1847-1848. Dubuque. [See Catfish Sandbar which Dakotas called Hogaŋ Owaŋka Kiŋ].



*Figure 7: Current view with Marina. Image courtesy of Earthstar GeoGraphics, Dakota County, USDA FSA, DigitalGlobe, GeoEye, Microsoft, CNES via ESRI.*

## REMA's ῥῆμα (utterance) / wičhóiyē (words) / hoye (voice) ¶2

Instead of piling basketfuls of earth to construct a snake mound from a one-foot-high tail, to a two-foot-high neck joining the human-size head of five and a half feet, this article piles ones with zeroes, as if letters and numbers in words, sentences and paragraphs. These words are arranged with the same hope they reflect some

of what REMA has encoded. This paper carries similar symbolic intent. But REMA's designers and builders required loving toil to speak clearly without words. REMA's symbolic, serpentine voice (ῥῆμα) still continues to speak to us today, though she is greatly damaged and disturbed beneath a fifty-year-old city dike.



### 5.5 tattooed words on one cubit? ¶3

If the above acknowledgement (one ¶) and abstract-synopsis (three ¶ ¶ ¶) paragraphs symbolically represent the snake's head and three tail-rattle mounds, then these 12 ¶ ¶ ¶ ¶ ¶ ¶ ¶ ¶ ¶ ¶ ¶ ¶ are re-constructing and reading the possibly pregnant body until it grows to 1360 words. These 1360 words represent both 266 days and

### 266 day pregnancy = 1360 words ¶4

This word-snake analogy continues: [Head ¶, 117 + Tail ¶ ¶ ¶, 386] = 503 words divided by 1863 total = 27.0%. So the 1360-word Body divided by 1863 = 73.0%. Now apply these percentages to the snake's total length of 364 cubits, confirming the body is 266 cubits or 73% of a year (9 months) representing pregnancy. The head

and tail represent the remaining 98 days of the year since conception, but after birth. Breathing through an umbilical cord for 266 days = 9.01 synodic months and 98 days off-cord = 3.32 months for 12.33 syn. mos./yr.

and tail represent the remaining 98 days of the year since conception, but after birth. Breathing through an umbilical cord for 266 days = 9.01 synodic months and 98 days off-cord = 3.32 months for 12.33 syn. mos./yr.

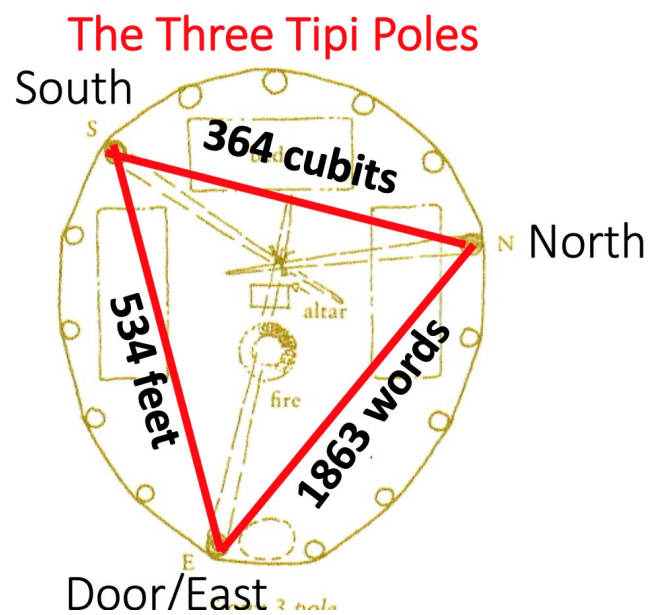
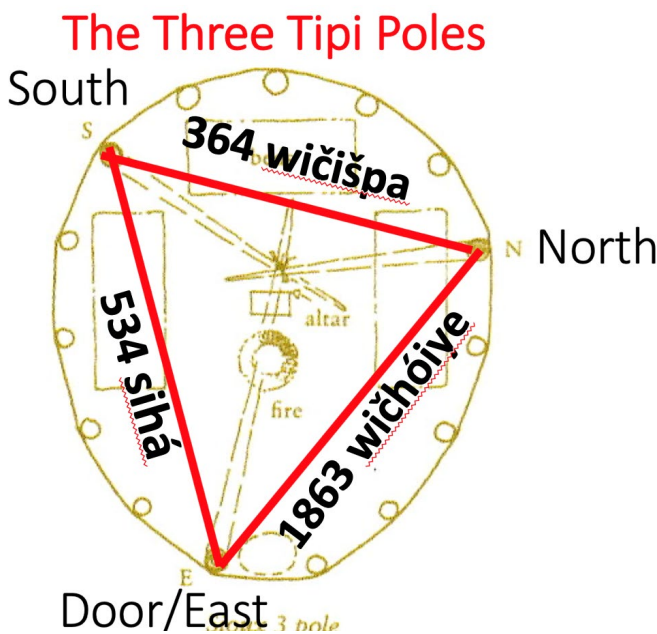


Figure 1A: The Three Tipi Poles. Modified from original courtesy of Tom Bean. Via Scott Thybony (2003). *The Tipi: Portable Home of the Plains*. Western National Parks Association.

Figure 1B: The Three Tipi Poles. Modified from original courtesy of Tom Bean. Via Scott Thybony (2003). *The Tipi: Portable Home of the Plains*. Western National Parks Association.

## 2018 – 2020 Hands-Feet-Cubits ¶5

So this is offered with even greater confidence than two years ago to update and further affirm Rock and Gould’s (2018) synopsis and abstract as stated:

By examining the strong feminine cosmology connected to these sites through a lens of Critical Indigenous Pedagogy of Place (CIPP) along with the study of astronomy and Indigenous environmental education...we can now say with relative confidence, that these mounds were used for measuring and commemorating cycles of time for well over one or two thousand years. Their use predicted the reoccurrence of feminine lunar and masculine solar syzygy (eclipse measurement), and held numerical and symbolic interpretations of spacetime cycles....These mounds mirror earth with sky as interdisciplinary expressions of art, humanities, science, math, engineering and technology. We also examine the strong feminine cosmology connected to these sites and the impact of colonial settler practices through a lens of ecofeminism and CIPP. Through this research we believe we have decoded some of the meaning

and purpose behind these amazing earthworks. After examining a decolonized measuring system, the not-so-hidden meanings became even more apparent.

It is probable that cubits, feet and hands were all used to build REMA avoiding decimal units. Whole number ratios work well. Using three hands (**napé**) as a foot (**sihá**), we see that the last tail mound = 3 h./ft. x 20 ft. = 60 hands, and the other two mounds before it are 3 h./ft. x 18 ft. = 54 hands each. So the tail is also 168 **napé** (or 56 feet or 38 cubits). The body is 266 cubits or 390 feet or 1170 hands. The head is 56 feet wide (2 x 28 feet or 38 cubits) by 88 feet (60 cubits or 264 hands) long. So seven tails, 7 x 38 = 266 cubits equals the body, a ratio of **7T:1B**. Since the head’s width is another 38 cubits, is it counted as a ninth part to the 7 + 1 “tails”? Is this part of ceremonial snake-cutting knowledge into segments? Maya oral tradition says a snake could be cut into 7 to 9 or 13 parts. So this snake article’s head = 1¶, body = 12¶, and tail = 3¶.

### 7T:1B Above, [B-T]/S Below See Fig. 2 below ¶6

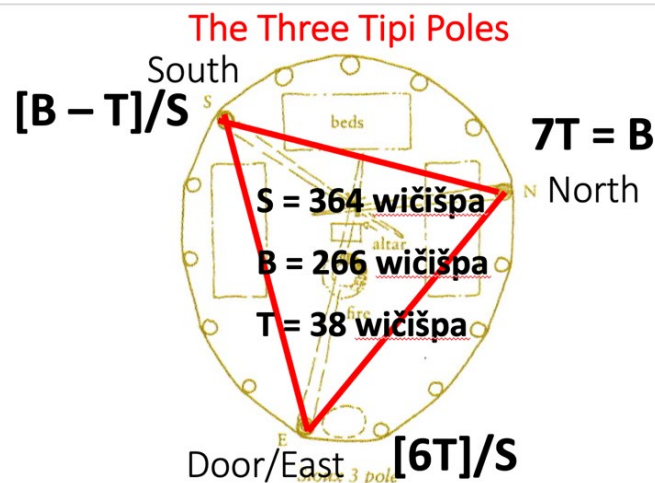


Figure 2: The Three Tipi Poles. Modified from original courtesy of Tom Bean. Via Scott Thybony (2003). The Tipi: Portable Home of the Plains. Western National Parks Association.

More precisely, the entire snake is 364 cubits or 534 feet or 1602 hands. 1602 H. divided by 6 H. high neck = 267 days. So  $13 \times 28 = 364$ , but  $9.5 \times 28 = 266.0$  and  $9.0 \times 29.53059 \text{ dys./syn. mo.} = 265.775!$ \*\*\* The ratio of body to snake is  $1170:1602 \text{ hands} = 73.03\%$ . So  $0.7303 \times 364.0 \text{ dys./yr.} = 265.8 \text{ days/pregnancy}$ . The Dakota Red Day star (planet Venus) is associated with pregnancy and twin average appearances of 263 days a.m. or p.m. in a 584 day cycle (Lee, Rock,

and Wilson 2012). So  $5 \times 584 = 8 \times 365$  is an eight year return of Venus to its sidereal place in the stars. The author noticed: If  $B = 7T$  and  $[B-T] = kS$  then  $6T = kS$ ; where  $k = 0.626$ . **[Body minus Tail]/Snake** =  $[266 - 38] \text{ cubits}/364 \text{ cubits} = 0.626$ . Also  $1002 \text{ hands}/1602 \text{ hands} = 0.6255$ , the inverse of which is  $1.598(8)$ . Finally,  $1.598(8) \times 365 \text{ days} = 583.56 \text{ days}$ , very close to the Venus sidereal period of  $583.92 \text{ days}$  (0.06% error= 99.94% accuracy). See Fig. 3 below:

<b>B or no B</b> \ <b>units</b>	<b>feet</b>	<b>cubits</b>	<b>hands</b>	<b>mean</b>
<b>[B - T]/S</b>	<b>0.625(5)</b>	<b>0.626(4)</b>	<b>0.625(5)</b>	<b>0.625(8)</b> <b>0.030% error</b>
<b>[6T]/S</b>	<b>0.629(2)</b>	<b>0.626(4)</b>	<b>0.629(2)</b>	<b>0.628(2)</b> <b>0.027% error</b>

$$\frac{\text{Earth Sidereal Year}}{\text{Venus Sidereal Year}} = \frac{365.256363 \text{ dys}}{583.92 \text{ dys}} = 0.62550$$

Figure 3: Earth and Venus sidereal years. Image courtesy of Jim Rock.

## VENUS : EARTH RATIO 79 minutes or 27 minutes ¶7

By applying the “Snake Hands” ratio (yes, snakes have hands!) of 0.6255 times 584 Venus days we derive **365.292 days** per Earth year! This is just 0.014% error. Also 23.93 hrs/day x 365.292 dys/yr = 8741.44 hours/year instead of 8740.2456 or 1.19 hour = only **79 minutes more per year!** This is 99.986% accurate! Using an even better Venus value shows:

$1602 H/1002 H = 1.598(8) = 583.92 \text{ days}/[? \text{ days for Earth year} = \mathbf{365.224... \text{ days}}]$ .

## 9 Moons = Pregnancy while 405 Red Moons < 33 Years ¶8

Dakotas use 405 red tobacco ties in various ceremonies, while the Maya calculated 405 red moons = 46 Tzolkin of 260 (13 x 20) days = 11,960 days. So a “red moon” is a synodic lunar period of 29.53086 days, not 29.53059 days, as NASA measured in 1972 with an earthly laser reflected by a lunar mirror. This is only 20 seconds per month or 0.001% error = 99.999% accuracy! 405 moons (32.7454 years) is a triple tritos (3986.628 days) eclipse cycle:

$3 \times 135 = 405 \text{ lunations}$ . Six examples of 33 years follow: Moses carried a snake staff for 33 + 7 years. Was Jesus’ lifespan 405 moons ending

This 0.0182 day difference is 0.005% error (99.995% accuracy) **or only 27 minutes more per year!** Were Dakotas measuring Venus or Earth to 99.9% or 99.99% perfection using a snake? The answer is...Yes! Also, the Great Ballcourt of the Maya is 545 feet or 11 feet (or 8 cubits) longer than REMA (2.0% difference). It was dedicated to KukulKan, their flying, feathered Serpent Venus a.k.a. QuetzalCoatl.

with an eclipse? His recently deceased follower, civil rights icon John Lewis, served 9 months beyond 405 moons in Congress before returning to the stars. Chris “down by the river” Farley of 1964 Madison died in 1997 Chicago at 12,360 = 33.8406 yrs. = 405 red moons + 400 days. Madison to Chicago lie on the greatest annual lunar standstill alignment (see ¶12)! Naya Rivera lived 12,231 days = 414.18 red moons or 129 days more than Farley. Malinalli “Doña Marina” Malin-che/tzin, 33-55 yrs., b.1496 – d.1529/1551? = ? red moons. See CihuaCoatl-Coatlikwe connection.

## Snake Tracks and Serpent Paths X Serpent Tracks and Snake Paths ¶9

The Great North American Eclipse crossed Turtle Island on Aug. 21, 2017. A Saros 145 family member with a 1963 total solar “relative” crawled further north across Canada just grazing Maine. Saros family #136 began in 1340 C.E. and occurs 71 times every 18.03 years. This interval of 1280 years has a 54 year proximity reoccurrence in a related shadow pattern [Since  $3 \times 18 = 54$ , and  $1963 + 54 = 2017$ ]. Were these giant sinuous paths on the ground considered as celestial snake (word-year#1805; Twin Bdotes taken by Pike) counterparts of Unktehi below? Dakotas

have a 16 star snake constellation as depicted in Lee and Rock’s D(L/N)akota Star Map (2012) and the accompanying guidebook (Rock and O’Rourke 2014).

By sending out observers and messengers, such serpent tracks could be validated and studied. Other non-Saros paths still need to be investigated for likelihood of REMA (#1836 REMA still Dakota; Wisconsin Territory) vicinity ( (#1837 REMA lost to treaty) crossings (#1838 Trail of Tears; Iowa Territory).



## Natural Literacy and Natural Numeracy = Nature's Programming ¶10

A (#1839) generation (#1840) may (#1841) only (#1842) briefly (#1843) look (#1844) back (#1845) upriver (#1846; Iowa statehood) to (#1847) its (#1848 Wisconsin statehood) ancestors (#1849 Minn. Territory) from (#1850) its (#1851 Treaty, more land gone) own (#1852) place (#1853) in (#1854) the (#1855) river (#1856) of (#1857) spacetime (#1858 Minn. Statehood). We (#1859) see (#1860) through (#1861) our (#1862) own (#1863)... **Paper-Snake ENDS HERE. 503 + 1360 = 1863...** **But these 12 plus 393 more words reach 405 words beyond 1863. 1863 + 405 red moon words = 2268... or 248 years from now? Since 2020 – 248 = 1772 six years post-Carver at Wakanj Tipi Cave.**

We see through our own...lenses, languages and location while remaining tied to a tree on the riverbank. What messages did the ancestors leave

## Death Rattle for Rattlers? ¶11

Imagine a daily killing of five and a quarter snakes for 15 years from 1967 (#2020) to 1982. In Houston County alone, 28,685 timber rattlesnakes were bountied for \$1 to \$8 per snake. So \$100,000 nearly bought their extinction. Minnesota was the last state to offer such bounties. A veterinarian and the Minnesota Herpetological Society gained sponsorship of

## 630-Mile Snake Path ¶12

Gould and Rock (2016, 2017) and Rock and Gould (2018) have researched the riverside mounds under threat and in need of interpretation from an Indigenous, astro-geographical, archaeo-astronomical perspective. REMA shows a remarkable use of 18.03, 18.61 and 19 year eclipse cycles observed with incredible precision

us (#1883 Lewis measures REMA)? By natural literacy and natural numeracy (Rock 1997) they painstakingly wrote and encoded life and birth into an effigy snake mound. The Gen X and millennial generations may think of REMA as coders or software developers. Programming is how you get computers to solve problems and to instruct the computer to perform tasks. What tasks or problems was REMA solving? What information was stored and processed to give answers? How was this output data displayed, read and interpreted? These codes and illustrations are offered in Rock and Gould (2018). Yet snakes were killed and the snake mounds razed without ever learning the  $\rho\eta\mu\alpha$  of REMA. This computational serpent and (#1989 see law next ¶) its messages were left to sewage and landfill, instead of being read fervently or “religiously.”

bills to stop this. Those voting against were 12%, so the bills were passed and signed into law May 3, 1989 (Minnesota House of Representatives 1990). This was the Chinese year of the snake, one month before Tiananmen Square and the millennial generation was being born. As REMA's tail is 10.5%, more than this (12%) still wanted snakes killed to extinction.

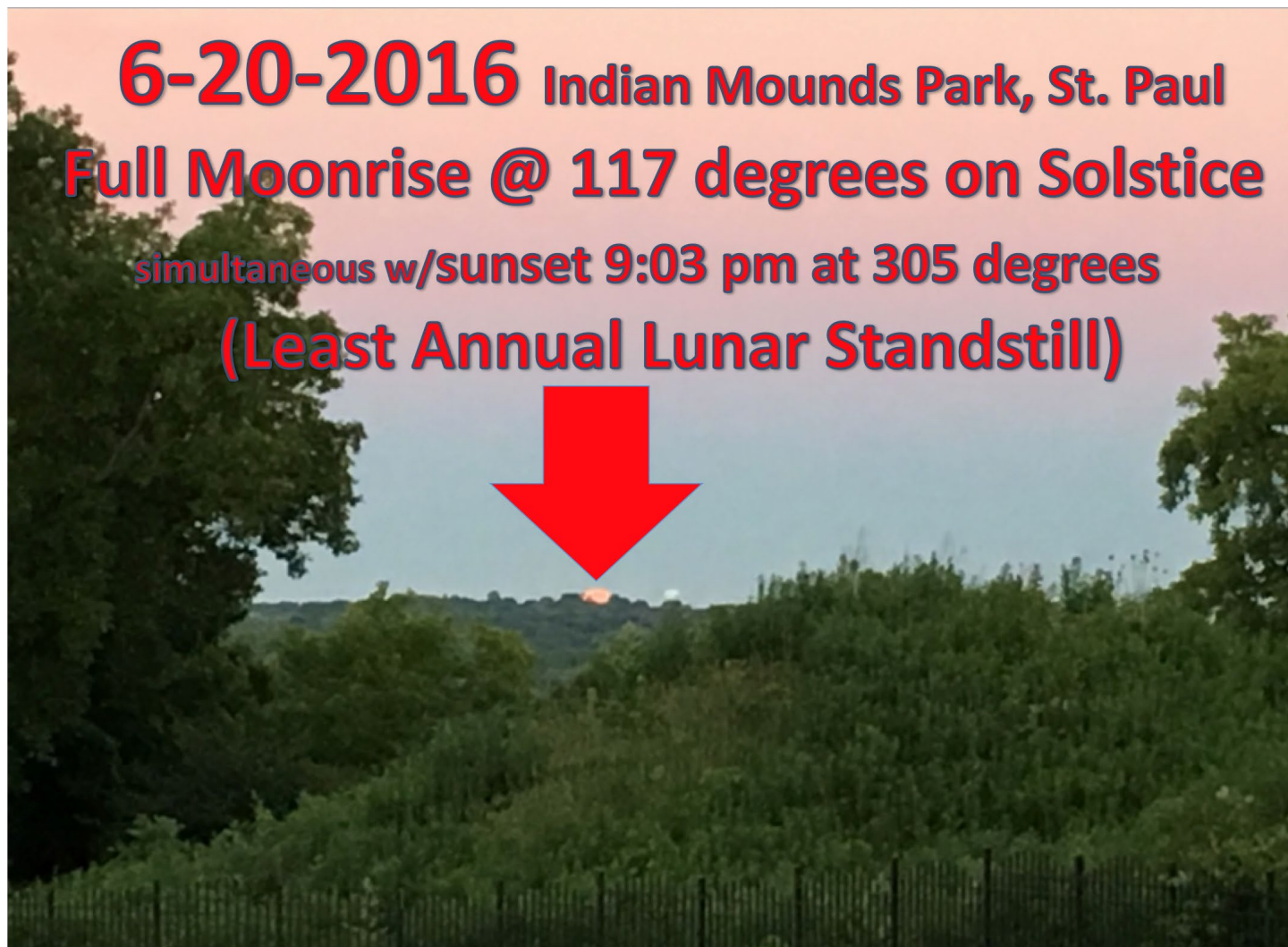
(99.97%) by Dakota ancestors (Rock and Gould 2018). But long distance implications show at least a 630-mile network from REMA through 21,000 rattlesnake and thunderbird mounds at Madison (Ho-Chunk) and on over to Chicago and the Giant Serpent Mound Ohio (see figures 9 & 10).

## Ohio Syzygies ¶113

In closing, because of CoVid-19, Rock was unable to deliver lectures requested by Ohio State University for their 150th anniversary on (1870–2020) spring equinox. Like the University of Minnesota, Ohio State is a land grant university by the (im)Morril(a)l Act of 1862.

1,862-3 words for this article is the exile year from our Dakota homeland. 1862–3 was also the start of \$25 to \$200 bounties on Dakota people (25 times more than snakes a century later). The author's intent for Ohio and this article of 1863+405 words was to show a linear, lunar connection between our sites along the GALSA/A, greatest annual lunar standstill azimuth/angle

(≈131–133 degrees). When the 1883 Lewis data (1887) was converted 135–137 years later by the author to cubits, hands and feet, it more strongly affirmed a beautiful, feminine, long-distance Earth-Moon-Venus-Ohio-Wisconsin-Minnesota relationship to ceremonially and generationally walk from full moon to full moon for 30 days at 21 miles/day every 18.6 years. The Ohio Great Serpent also seems to be a symbolic, umbilical cord to/from earth with solar-lunar eclipse syzygies. This hypothesis would substantiate TEK of long-term phenology and phenomenology shared across Indigenous communities over a millennia or two ago. Mitakuye Owasin!



*Figure 10: Solstice at Indian Mounds Park. Image courtesy of Jim Rock.*

## 17 Dakota + 1 Non-Dakota = 18 Glossary Terms

### Bdote

where rivers join, especially the Mni Sota Wakpa & Wakpa Taŋka (@Twin Cities) but also where the St. Croix meets Wakpa Taŋka (Misi Ziibi)

### čekpa

navel, umbilical cord, [twin(s)/čekpapi], 7<sup>th</sup> child (birth order)

### dekši

uncle

### kapemni\*

twisting, spinning...like crossed tipi poles with above & below mirrored



### Hoǵáŋ Owáŋka Kiŋ:

The Fish Camp (Afton, Minnesota)

### hoye

voice

### Mitakuye Owasiŋ!

We are all Relatives...all my Relations!

### Mni Sota Makoče

land where the water reflects the sky

### napé

hand

### Pahá Zuzéča Siŋté Ĥda

(PZSĤ) rattle(tail) snake mound...a.k.a. REMA

### sihá

foot

### TEK

traditional ecological knowledge

### Uŋktehi

horned snake creation story being who rules waters & aquifers. esp. Wakan Tipi cave

### Wakaŋ Tipi

A cave in Dakota birth creation story which mirrors star of bison backbone (3 stars)

### Wakiŋyaŋ

Thunderbird creation story being who brings storms, lightning & thunder from West

### wičáhŋŋpi

Star, old style star symbol was \*kapemni



### wičišpa

Dakota cubit from elbow to tip of middle finger...in REMA's case about 17.6 inches

### wičóiyē

word(s)

\*\* The 266 word short article became 7 times longer as I wrote, which is like a foreshadowing of the 7 x 38 cubit tail, which makes a 266 cubit umbilical cord snake body. I also implicitly conjecture that because as Ocheti Shakowin Oyate we embody the Seven StarFire Nations in our Buffalo and Dipper constellation(s). This implies the Tipi rope is an umbilical cord as the three stars in the bison backbone are the three

tipi poles. Everything is polysemous for us like Indigenous symbolic hypertext to travel to other dimensional meanings...Also 1862 is the year settlers use to define us or contain/limit/keep us in our war-torn subjugated state. So I'm writing beyond 1862-2 here to include the now and future decolonized revivification.

\*\*\*The year was thought of as 13 moons of 28 days (=364 not 365) and pregnancy as 9 moons

of 29.555 days, but decimal units can be avoided by using ratios. The Body minus Tail (B-T) mnemonic as well as 7 tails (7T) mnemonic both help to achieve awesome accuracy when using hands compared with cubits. Venus is related to pregnancy and fertility for us because it is a morning or evening star for 263 days on average and pregnancy is 266 days.

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