Rig Veda Magic Squares

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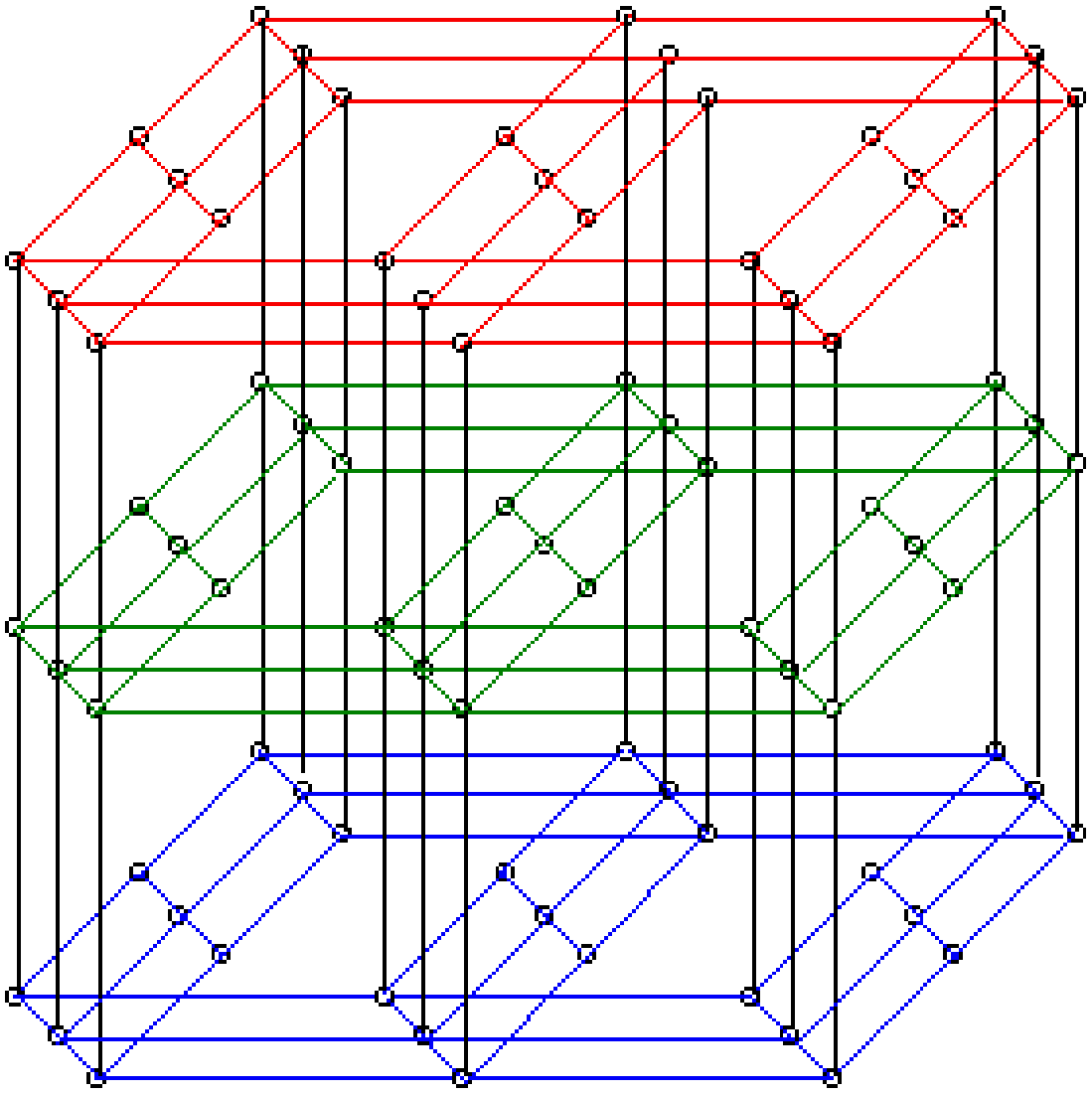

Abstract

Sanskrit scholar Christopher Minkowski of Oxford University has revealed how Nilakantha, a 12th Century Indian mathematician, decoded Magic Squares in the Rig Veda, which is the oldest book known to humanity. Those Vedic Magic Squares comprise one aspect of the higher nuclear technology encoded in Vedic Literature. This paper relates Minkowski's argument and supplements this with additional explanatory material.

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Introduction

My primary intellectual concerns since 2003 have been the advanced metaphysical systems, known in China as Qi Men Dun Ji and Da Liu Ren. Qi Men Dun Jia is based on a 3 x 3 Luo Shu Magic Square, while Da Liu Ren features two 4 x 4 squares around the perimeters of which move the major symbols. One day while researching these topics, I came upon a citation for a paper written by Christopher Minkowski of Oxford University, about Magic Squares. At that time, the essay had yet to be published in a Russian festschrift, so I emailed Professor Minkowski and requested the essay, which he promptly sent.

I found it somewhat ironic that this professor bore the name Minkowski, and inquired whether he was related to the Minkowski of Minkowski Time fame, to which my correspondent failed to reply. It seemed somewhat amusing that Professor Minkowski was assisting my efforts to destroy the paradigm, for which Minkowski Time forms a foundational pillar. Minkowski Time was invented to support the untenable form of Einstein's Relativity, and so today forms an aged intellectual construct that cries out for replacement.

The last time I checked, the Russian festschrift had been published in Russia, but was difficult to impossible to find in the west. Most of the other essays apparently are written in Russian. To secure a copy of the essay, one must travel to Russia and buy a copy of the festschrift, if they remain available, or possibly locate a Russian library that will allow copying.

For this reason, this paper presents much of the original essay, with additional material supplied from Wikipedia or the internet.

As a graduate student at National Taiwan University in Taipei, Taiwan, I roomed with and studied with a brilliant Confucian scholar from the University of Chicago, who attended "Tai Da" in the same program in order to further his knowledge of ancient Chinese literature. At the time, I was struggling to speak basic Mandarin, so I found his knowledge quite astounding. My room mate explained to me that a single verse of Confucian philosophy could be interpreted on as many as four to ten separate levels.

In his daily classes, his Chinese teachers would require him to expiate, in

Chinese, on these differences. In this way I came to know that in ancient Asian literature, any piece of writing was constructed on multiple levels, that there was not a single standard way of interpreting a verse, but there were many simultaneous, equally valid interpretations which were intended by the author. If a writer did not know how to write in this style, then he would have been considered too ignorant to have his works published or remembered.

In addition, Sanskrit was invented some 14,000 years ago as a scientific language expressly for passing on Vedic knowledge, since the inventors of Sanskrit were well aware that Earth would pass through an Ice Age and pole shift, where their Siberian homeland would freeze over. For this reason, the authors of Sanskrit developed the language in order to encode their highly – advanced scientific knowledge.

To achieve this goal, the builders of Sanskrit attached numerical value to each Sanskrit letter. Thus, a passage in Sanskrit which appears to describe a religious theme (as humans have generally interpreted the Vedas for millennia) in fact describes nuclear physics.

G. Srinivasan describes how he decoded Sanskrit verses in the Sankhya and other verses (see next section for an example), while Dr. K.C. Sharma decodes Vedic Literature, from the Rig Veda to the Puranas, in a similar manner. Both of these Sanskrit translators rely upon a scientific level to the apparently religious text. Only readers from an equally scientific culture would understand the scientific meaning encoded in the text. Thus it was that few could interpret the scientific level of Vedic Literature until the latter half of the 20th Century. Most likely, the creators of the Sanskrit landed intended that no humans would understand the scientific encoded messages until a new civilization arose which understood nuclear physics. In other words, the Sanskrit creators were not going to allow boys to play with dangerous toys.

As things stand today, one Nobel laureate has condemned the Octonions as “useless” for physics, a charge echoed by an American doctoral student upon completion of his dissertation. One may only assume that the professors on his dissertation committee approve (or possibly even taught this mistaken idea) of this statement, and now the idiot blissfully passes on his hard – earned ignorance to another generation of American graduate students. It took until 1960 for the west to derive Bott Periodicity, the 1990's to derive the Spinorial Clock and the Clifford Clock, and the 21st Century before some western mathematicians began to appreciate Clifford Algebras. From the observations of this author, western mathematics and physics lay dormant in their infantile stages, especially in comparison with Vedic Science.

Srinivasan writes:

"Sanskrit" means a refined code. "Sama" means equalised and "krit" means cut, clipped, divided, pulsed or in other words a code. The language was developed scientifically and logically as the only possible code human beings could create

naturally with the equipment they had, the human body.

In his essay, we thus find Minkowski holding the 17th Century Nilakantha from medieval India, who was writing about a document from 11,000 BC, to a modern standard from the 21st Century United Kingdom. In reality, Nilakantha does not NEED to prove anything. On the contrary, Minkowski and others today need to place themselves within the context of the Veda people, the creators of the Sanskrit language, who predicted cataclysmic Earth changes (please refer to the author's paper on Vixra with regard to the Mayan calendar), and thus needed to reinforce their Brahmanic oral tradition of transmitting advanced scientific knowledge from father to son in a closed social class of intellectuals.

To his credit, Minkowski lets up on Nilakantha somewhat in his conclusion, yet the overall tone of his essay reflects the British imperialist view of Hindu culture: those dark – skinned obnoxious people could never in a million years have devised something superior to old British know – how. Minkowski is so imbued with his British racist attitudes that he fails to appreciate Nilakantha or his ancient scholastic methods. Instead, he holds Nilakantha to modern standards, and thus falls into the fallacy of judging antiquity from the limited perspective of contemporary academia.

Nilakantha was a genius, and Minkowski nevertheless reveals Nilakantha's methods, despite Minkowski's obvious dislike for them. In this way, we may appreciate Magic Squares for what they are. In a recent paper published on Vixra, this author explains how Magic Squares figure into Chinese metaphysics, and their extention, via Bott Periodicity, reaches as high as the Octonions, Sedenions and quite possibly the Trigantaduonions, which allows for far – ranging prediction.

Western science to date has not created any such accurate predictive models, probably as a direct result of the ignorance of academics who disdain study of Magic Squares, Octonions, Sedenions and Trigantaduonions.

Rig Veda

ऋग्वेद संहिता

| अथ प्रथमं मण्डलम् |

| अथ प्रथमोऽष्टकः |

(प्रथमोऽध्यायः ॥ वर्गाः 1-37)

(9) **1** (म.1, अनु.1)

ऋषिः मधुच्छन्दाः वैश्वामित्रः	छन्दः गायत्री	देवता अग्निः

ॐ अग्निमीळे पुरोहितं यज्ञस्य देवमृत्विजम् । होतारं रत्नधातमम् ॥ 1 ॥
अग्निः पूर्वेभिर्ऋषिभिरीड्यो नूतनैरुत । स देवाँ एह वक्षति ॥ 2 ॥
अग्निना रयिमश्नवत्पोषमेव दिवेदिवे । यशसं वीरवत्तमम् ॥ 3 ॥
अग्ने यं यज्ञमध्वरं विश्वतः परिभूरसि । स इद्देवेषु गच्छति ॥ 4 ॥
अग्निर्होता कविक्रतुः सत्यश्चित्रश्रवस्तमः । देवो देवेभिरा गमत् ॥ 5 ॥
यदङ्ग दाशुषे त्वमग्ने भद्रं करिष्यसि । तवेत्तत्सत्यमङ्गिरः ॥ 6 ॥
उप त्वाग्ने दिवेदिवे दोषावस्तर्धिया वयम् । नमो भरन्त एमसि ॥ 7 ॥
राजन्तमध्वराणां गोपामृतस्य दीदिविम् । वर्धमानं स्वे दमे ॥ 8 ॥
स नः पितेव सूनवेऽग्ने सूपायनो भव । सचस्वा नः स्वस्तये ॥ 9 ॥

The first verse of the Rig Veda in Sanskrit, decoded below:

As an example the very first Sloka from of the Rigveda is decoded and interpreted as explained below.

The Sanskrit phrase with its equivalent meaning is:

Agnimile purohitam yajnasya devamritvajam hotaram ratnadhatam.

Agnimile Through expansion (by heat)
Purohitam Theorising (by Pundits)
Yajnasya Triggering (Sacrifice triggers nature to act)
Devamritvajam Substratum of space(essence of nature)
Hotaram Extraction of
Ratnadhatam Free energy (gift of the highest order)

"By triggering the expansive qualities of the fundamental substratum abundant free energy can be obtained".

The number value decoded from the original Sanskrit code is '353128618718456488622269 55' It represents the numerical value of the volumetric rate of light radiated in cubic yards per unit time of one Vedic second.

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Agni	mi	le	pu	ro	hi	th'm	ya	jna	as	ya
3	5	3	1	2	8	6	1	8	7	1
de	va	mri	th	va	j'm	ho	tha	ram		
8	4	5	6	4	8	8	6	2		
ra	tna	dha	th	ma	'm.					
2	2	6	9	5	5					

In Sankhya the Triguna theory of simultaneous and self similar interactions derives the standard oscillatory cycle of components in space through axiomatic theorems and equals 2.965759669e+8 interactions per cycle, which is approximately equal to the frequency of the modern velocity of light at a wavelength of a meter in 1.010845 seconds.

This axiomatic value must be corrected for two factors that affect the time value. The Solar system (Earth) has a relative motion of approx. 250000m/sec with the centre of the Galaxy and the time factor changes by 1.010845 for the orbital velocity around it.

Meter to yard conversion factor of 1.30795 for cubic space and a time correction of 2.99792458e+8/1.486e+11 shown below, which is an indicator of their scientific knowledge. It yields the value of 3.5312861 x 1025 cubic yards per second exact to the 7th decimal place of the value from the Rig Vedic theorem. Statistically, this
equivalence cannot be an accident.

Later, Srinivasan explains why it is important to consider the background of the reader and of the writer:

There is direct evidence from the Sankhya Karika itself that the meditative or holistic thinking process should be followed in interpreting the Suthras, for any language is built up by a structured logic based on human experience and is conditioned by the environment and period in which it is developed.

Since it is difficult to pin down with absolute certainty the meaning of key words that may have changed with the passage of time, holistic imaging leading to three dimensional visualisation of complex phenomenon is the next closest means to interpreting reality, correctly.

As a case in point, almost all the major epics, such as the Mahabharata and Ramanya, are presentations of complex and profound scientific concepts through dramatic enactment. It is a substitute for a modern video presentation.

The Atharvaveda book 19, chapter7, verses 1 to 5, and chapter 8, verse 1 under Nakshatradevatyam identifies 28 Nakshatras as the number of divisions in the stellar horizon. The Sanskrit term Nakshatra (Na = 'not' Aksha = 'terrestrial latitude' Atra = 'in this case' meaning not a terrestrial latitude in this case) is a label to identify a numerical angular position or celestial latitude or longitude. It eliminates the need to specify an arbitrary angular limit like 360 degrees in a circle.

The number 28 came about from Sankhya theory where Prakriti binds by 7 divisions in each direction and the four quarters gave 28 divisions in a plane giving 12.857 degrees per section in modern notation. The 7 comes from the integer mathematics used in Sankhya (most likely related to the Octonions and the Fano Plane – author's note).

The basic volume is proportional to the first, fundamental or elemental unit radius

$$\mathbf{3 = 1^3}$$

and the next incremental radius of

3=8 units

When the volume increases by doubling the radius, it grows from 1 to 8, or 7 volumes are added. Since the basic volume cannot be detected, because the process of detection is relative (or by comparison), only 7 volumes can be measured with reference to the first volume. 8-1=7. the logic is based on the concept that a truly elemental unit cannot be fractionalised, because if it can be, then it is no more an elemental unit. This is the basic reason for the spectral range of seven segments in any field.

Kaṭapayādi System

कटपयादि

Wikipedia states:

***Ka· a·pa·y ·di* (Deva·n gar:) system** (also known as *Paralpp ru*, Malayalam:) of numerical notation is an ancient Indian system to depict letters to numerals for easy remembrance of numbers as words or verses. Assigning more than one letter to one numeral and nullifying certain other letters as valueless, this system provides the flexibility in forming meaningful words out of numbers which can be easily remembered.

Following verse found in a karavarman's *Sadratnam la* explains the mechanism of the system.[7][8]

: : :

Transiliteration:

nany vaca ca ny ni sa khy ka apay dhaiva e t p ntyahal sa khy na ca cintyo halasvara

Translation: *na* ( ), *nya* ( ) and *a* ( )-s, i.e., vowels represent zero. The nine integers are represented by consonant group beginning with *ka*, *a*, *pa*, *ya*. In a conjunct consonant, the last of the consonants alone will count. A consonant without vowel is to be ignored.

Explanation: The assignment of letters to the numerals are as per the following arrangement.

1	2	3	4	5	6	7	8	9	0
ka	kha	ga	gha	ṅa	ca	cha	ja	jha	ña
ṭa	ṭha	ḍa	ḍha	ṇa	ta	tha	da	dha	na
pa	pha	ba	bha	ma	-	-	-	-	-
ya	ra	la	va	śa	ṣa	sa	ha	-	-

Consonants have numerals assigned as per the above table. For example, ba ( ) is always 3 whereas 5 can be represented by either *nga* ( ) or *a* ( ) or *ma* ( ) or *ha* ( ).

All stand-alone vowels like *a* ( ) and ( ) are assigned to zero.

In case of a conjunct, consonants attached to a non-vowel will not be valueless. For example, *kya* ( ) is formed by *k* ( ) + *ya* ( ) + *a* ( ). The only consonant standing with a vowel is *ya* ( ). So the corresponding numeral for *kya* ( ) will be 1.

There is no way of representing Decimal separator in the system.

Indians used the Hindu-Arabic numeral system for numbering, traditionally written in increasing place values from left to right. This is as per the rule *a k n m v mato gati* ( ) which means numbers go from left to right.[9]

Mathematics and astronomy[edit]

M dhava's sine tableconstructed by 14th century Kerala mathematician-astronomer M dhava of Sa gama·gr ma employs the Ka apay di system to enlist the trigonometric sines of angles.

Kara a·paddhati, written in the 15th century, has the following *loka* for the value of pi ( )

-

-

Transliteration
an nan nn nananunnanityai
ssm hat cakra kal vibhakto
ca ucandr dhamaku bhip lair
vy sastadarddha tribhamaurvika sy t

It gives the circumference of a circle of diameter, *an nan nn nananunnanityai* (10,000,000,000) as *ca ucandr dhamaku bhip* (31415926536).

a kara·varman's *Sad·ratna·m l* uses the Ka apay di system. A famous verse found in *Sad·ratna·m l* is

भद्राम्बुद्धिसिद्धजन्मगणितश्रद्धा स्म यद् भूपगीः

Transliteration
bhadr buddhisiddhajanmaga ita raddh sma yad bh pag
Splitting the consonants gives,

bha	d	r		ba	d	dh	sa	d	dha	ja	n	ma	ga	a	ta		ra	d	dha	s	ma	ya	d	bha	pa	gi
4	-	2	-	3	-	9	7	-	9	8	-	5	3	5	6	-	2	-	9	-	5	1	-	4	1	3

Reversing the digits to modern day usage of descending order of decimal places, we get *314159265358979324* which is the value of pi ( ) to 17 decimal places, except the last digit might be rounded off to 4.

This verse encrypts the value of pi ( ) up to 31 decimal places.

गोपीभाग्यमधुव्रात-श्रुङ्गिःशोदधिसन्धिग ॥
खलजीवितखाताव गलहालारसंधर ॥

This verse directly yields the decimal equivalent of pi divided by 10:
pi/10 = 0.31415926535897932384626433832792

Carnatic music[edit]

Melakarta chart as per Ka apay di system

The melakarta ragas of the Carnatic music is named so that the first two syllables of the name will give its number. This system is sometimes called the Ka-ta-pa-ya-di sankhya. The Swaras 'Sa' and 'Pa' are fixed, and here is how to get the other swaras from the melakarta number.

Melakartas 1 through 36 have Ma1 and those from 37 through 72 have Ma2.

The other notes are derived by noting the (integral part of the) quotient and remainder when one less than the melakarta number is divided by 6.

'Ri' and 'Ga' positions: the raga will have:
Ri1 and **Ga1** if the quotient is 0
Ri1 and **Ga2** if the quotient is 1
Ri1 and **Ga3** if the quotient is 2
Ri2 and **Ga2** if the quotient is 3
Ri2 and **Ga3** if the quotient is 4
Ri3 and **Ga3** if the quotient is 5

'Da' and 'Ni' positions: the raga will have:
Da1 and **Ni1** if remainder is 0
Da1 and **Ni2** if remainder is 1
Da1 and **Ni3** if remainder is 2
Da2 and **Ni2** if remainder is 3
Da2 and **Ni3** if remainder is 4
Da3 and **Ni3** if remainder is 5

See swaras in Carnatic music for details on above notation.

Raga Dheerasankarabharanam[edit]
The katapayadi scheme associates dha9 and ra2, hence the raga's melakarta number is 29 (92 reversed). Now 29 36, hence Dheerasankarabharanam has Ma1. Divide 28 (1 less than 29) by 6, the quotient is 4 and the remainder 4. Therefore, this raga has Ri2, Ga3 (quotient is 4) and Da2, Ni3 (remainder is 4). Therefore, this raga's scale is *Sa Ri2 Ga3 Ma1 Pa Da2 Ni3 SA*.

Raga MechaKalyani[edit]
From the coding scheme Ma 5, Cha 6. Hence the raga's melakarta number is 65 (56 reversed). 65 is greater than 36. So MechaKalyani has Ma2. Since the raga's number is greater than 36 subtract 36 from it. 65-36=29. 28 (1 less than 29) divided by 6: quotient=4, remainder=4. Ri2 Ga3 occurs. Da2 Ni3 occurs. So MechaKalyani has the notes *Sa Ri2 Ga3 Ma2 Pa Da2 Ni3 SA*.

Exception for Simhendramadhyamam[edit]
As per the above calculation, we should get Sa 7, Ha 8 giving the number 87 instead of 57 for Simhendramadhyamam. This should be ideally Sa 7, Ma 5 giving the number 57. So it is believed that the name should be written as *Sihmendramadhyamam* (as in the case of Bra**hm**ana in Sanskrit).

Representation of dates[edit]
Important dates were remembered by converting them using *Ka apay di* system. These dates are generally represented as number of days since the start of Kali Yuga. It is sometimes called *kalidina sankhya*.

The Malayalam calendar known as *kollavarsham* (Malayalam:) was adopted in Kerala beginning from 825 CE, revamping some calendars. This date is remembered as *ch rya v gbhad*, converted using *Ka apay di* into 1434160 days since the start of Kali Yuga.[10]

Narayaniyam, written by Melpathur Narayana Bhattathiri, ends with the line, yur rogyasaukhyam ( ) which means long-life, health and happiness.[11]

In Malayalam	
In Devanagari	
In IAST	yur rogyasaukhyam
Value as per *Ka apay di*	1712210

This number is the time at which the work was completed represented as number of days since the start of Kali Yuga as per the Malayalam calendar.

The diagram above illustrates the katyapadi in Carnatic music. A final observation here is that other ancient societies based their time – keeping systems on Base 60, and thus were able to employ the same system for music. See for example the Pythagoreans as described by S.M. Philipps. The twelve divisions above have their counterpart in astrology, and the 24 correspond to the 24 seasons of Chinese ancient calendars. Each 12th is further divided into six parts, thus making 72 minor divisions. This level is finally divided into 432 micro levels. Note as well the central circle, divided into binary halves.

Minkowski's Argument

Nīlakaṇṭha on the Vedic Nature of Magic Squares

Nīlakaṇṭha's inventive reading of Ṛgvedic verses as propounding magic squares is found in the introduction to his commentary on the ŚTT, in which he presents a general discussion concerning the canonical nature of tantric works and practices in general, and of magic squares in particular. Theburden of Nīlakaṇṭha's general argument in the section is to show that tantric works are appropriately studied as a
part of mainstream or canonical Brahminical literature, and that magic squares, the numbers in them, and their uses, are meaningfulin that they refer to, or are directed towards, deities recognized by the Vedic tradition.
Nīlakaṇṭha therefore needs to show that tantric works fall inside the boundary of canonical Vedic literature. He further needs to show that numbers can be used in ways that are expressive of meanings that are significant in Vedic terms. As part of this argument, therefore, he wishes to show that the Vedas themselves contain ut-terances that refer to magic squares. If the Vedas describe the construction and wor-ship of magic squares, so Nīlakaṇṭha's argument will go, then the larger goal for his introductory argument is secured. This is why he devotes himself in some detail to establishing the point, by way of an interpretation of several Vedic verses.

As he did with the mantrarahasya works, Nīlakaṇṭha begins with a Vedic passage that lends itself plausibly and relatively transparently to his purposes, in this case a verse with many number words in it. What is distinctive to Nīlakaṇṭha's approach in this case, however, is a trick not found in the mantrarahasya literature.

This is his appeal to the kaṭapayādi system, a system for assigning numerical values to the letters of the alphabet. The kaṭapayādi system was, by Nīlakaṇṭha's day, well established in scientific and tantric literature.[7]

The employment of the kaṭapayādi system as a way to read Vedic verses is, needless to stay, unusual. In the first verse that he approaches, Nīlakaṇṭha applies the method sparingly, only to one word in fact. Once he has demonstrated his larger point, however, that the Vedas do ordain the practice of generating and inscribing magic squares, he uses the kaṭapayādi method to read all the numbers for a magic square from the words of another Ṛgvedic verse, a verse that happens to be closely associated with tantric practice, as we shall see. In what follows, I shall provide the text and an interpretative translation
of Nīlakaṇṭha's commentary on the Ṛgvedic verse where he establishes his method. I shall also provide a brief paraphrase of his comments on two other verses.

ṚV 10.114.6

Nīlakaṇṭha relies primarily on *ṚV* 10.114.6 to secure his claim that the *Ṛgveda* includes mantras that refer to magic squares. The verse is as follows:

> ṣaṭtriṃśā́ṃś ca catúraḥ kalpáyantaś chándāṃsi ca dádhata ādvādaśám ।
> yajñáṃ vimā́ya kaváyo manīṣá ṛ́ksāmā́bhyām prá ráthaṃ vartayanti ॥

The verse occurs in one of the more enigmatic hymns of the tenth maṇḍala, and one of the most numerological, in the context of what appear to be riddling questions about the nature of the sacrifice. The translation of this verse, following Geldner, is as follows:

> Through their intelligence the sages, measuring out the sacrifice, fashioning four (cups) to be thirty-six-fold and bringing the meters out all the way to twelve, set the chariot in motion by the praise verse and the praise song.[8]

asyārthaḥ | kavayo yajñaṃ vimāya ṛksāmābhyāṃ rathaṃ pravartayantīty anvayaḥ| **kavaya**ḥ krāntadarśinaḥ | **yajñaṃ** ya iti kādinava ṭādi nava pādi pañca yādy aṣṭau ity āgamaprasiddharītyā eka ucyate | jña iti jakārañakārayor yoge caramaśrutatvāt śūnyavācī ñakāro 'narthakaḥ | tena ja ity aṣṭāv ucyante | tām imām navasaṃkhyāṃ **vimāya** vividhena rūpeṇa mītvā eko 'ṣṭau saptadvitriṣaṭpañcacatvāra ity evaṃ krameṇa saṃgṛhya **ṛksāmābhyām** ṛk ca sāma ca ṛksāmaṃ ceti samāhārayor ekaśeṣaḥ | svakoṣṭhāt tṛtīyayā paṅktyā tṛtīyena ca koṣṭhena saha **ratham** aṅkayantrākhyaṃ upāsanāyantraṃ **pravartayantī**ty arthaḥ | **manīṣā** manīṣayā ṣoḍaśakoṣṭhe yantre yady ekāṣṭāṅkau prathamadvitīyakoṣṭhayor bhavatas tarhi tṛtīyapaṅktes tṛtīyacaturthakoṣṭhayor vāñchārdhapūraṇāv aṃkau lekhyau | vāñchā tadardhaṃ sphuṭayati pūrvārddhena | **caturaḥ** catuḥsaṃkhyākān **ṣaṭtriṃśān** śaṭtriṃśato gaṇān ṣaṭtriṃśāṃś **ceti** cakārāc catustriṃśān dvātriṃśāṃś ca catuḥsaṃkhyān ity ūhyaṃ | **kalpayanta** iti | ṣoḍaśakoṣṭhakasya catasraḥ paṅktayaḥ | pratyekaṃ ṣaṭtriṃśadaṅkopetāḥ kāryāḥ | **ā dvādaśaṃ** gāyatrīm ārabhya dvādaśaṃ chando 'tyaṣṭiḥ | tena saptadaśasaṃkhyā lakṣyate | dvādaśād arvāg **ā dvādaśam** ity arthe ekādaśam aṣṭis tena ṣoḍaśasaṃkhyā lakṣyate | **ā** arvāg **dvādaśaṃ** yasmād iti vyākhyāne trayodaśaṃ dhṛtis tenāṣṭādaśasaṃkhyā lakṣyate | **chandāṃsi** tattacchandaḥsaṃkhyākān aṅkān **dadhataḥ** sthāpayanta ity arthaḥ | evaṃ saptadvyādibhyo 'py aṅkebhyaḥ svasvakoṣṭhād uṣṭrapade vāñchārdhaṃ lekhyaṃ | evam anayor ekāṣṭāṅkayor agrimakoṣṭhadvikeṣu cālanāt tadanurodhena cāṅkāntarāṇāṃ nyāsādito 'nyā saptavikṛtayo bhavanti | evam ekāṣṭāṅkayor vyatyaye 'pi prakṛtibhūte saptavikṛtayo bhavantīti caturdaśavikṛtayo vijñeyāḥ | tad idam uktaṃ **caturdaśānye mahimāno asyeti** [ṚV 10.114.7a] **mahimāno** vibhūtayaḥ | etena digbhedena caturguṇāḥ | ṣaṭpañcāśad aṣṭābhiḥ prakṛtibhiḥ saha ekaikasyāṅkayantrasya catuḥṣaṣṭir bhedā bhavanti |

[2. aṣṭau: aṣṭāv SB | 4. aṣṭāv: aṣṭau AS2; aṣṭā SB. tām: nām AS2 | 5. catvāra: catvāri AS2 | 6. ṛk ca sāma ca: omits AS2. ṛksāmaṃ: ṛk ca sāma ca AS1 | 7. tṛtīyayā paṅktyā: omits AS2; saha: sa AS2 | 10. tṛtīyapaṅktes: tṛtīyapaṅktyes SB | 11. tadardhaṃ: tadardhe AS2, SB; caturaḥ: omits AS2; catuḥsaṃkhyākān: catuḥsaṃkhyān AS1 | 12. gaṇān: gaṇanān AS2; ṣaṭtriṃśāṃś: ṣaṭtriṃśac AS2; dvātriṃśāṃś: dvātriṃśāc AS2; omits ca AS2 | 13. catuḥsaṃkhyān: catuḥcatuḥsaṃkhyān AS1;

The meaning of the verse is this: The sages (**kaváyo**) are enlightened seers.

The term **yajñáṃ** must be understood using the kaṭapayādi method of identifying numbers with letters as it has been established by the Āgamas: *k* and the next 8 consonants in the standard alphabetical order are to be understood as indicative, in order, of the numbers 1–9; *ṭa* and following also indicate the numbers 1–9; *pa* and following also indicate the numbers 1–9; *ya* and the consonants following indicate the numbers 1–8. According to this method we find that the *ya* of yajña indicates the number 1. *Jña* is a conjunct consonant, and (although the kaṭapayādi system assumes that the second member of a conjunct is the only one to be counted), in this case *ñ*, though it is the last member of a conjunct, because it indicates 0, is not meaningful. Therefore 8 is indicated by *ja*.

(Add the 1 of *ya* + the 8 of *jña*, and one gets 9.) "Measuring out (**vimā́ya**) that which is nine in number." This means measuring it in its different forms, by which is meant bringing together the numbers 1–8 in the order: 1, 8, 7, 2, 3, 6, 5, 4. [These are the pairs of numbers that are used in the method known to Nīlakaṇṭha for generating magic squares of order four for variable sums. There is no attempt to show how this particular order—lowest, highest, next highest, next lowest, next lowest, next highest, next highest, next lowest—is derived from the verse, except that the first two in the series are given by the word in the Vedic passage, **yajñá**.]

"By praise verse and by praise song (**ṛ́ksāmā́bhyām**)." This is an ekaśeṣa compound, including some things which are not mentioned. It means by Ṛk and by Sāman and by the aggregate of Ṛk and Sāman. [Nīlakaṇṭha takes this term to express another element of the method of generating magic squares of order four, a distinctive movement from one cell in the magic square to another one (see below). I don't understand how Nīlakaṇṭha derives this movement from the term in question, except that the movement involves two cells down and two cells over, and that he wants the compound to refer to two things plus an aggregate of a pair.]

Moving from their own square to the third column and the third row away, "they make the chariot (**rátha**), i.e. the ritual diagram called a magic square, roll (**právartayanti**)."

"Through their intelligence" (**manīṣā́**). This means that if they put the numerals 1 and 8 in the first two cells of a magic square with sixteen cells, [i.e. of order four], then (using their intelligence) they write numerals in the third and fourth columns of the third row, which make the sum of half the desired amount of the square. [Another element of the method for generating magic squares of order 4 that is known to Nīlakaṇṭha is, after putting 1 and 8 in the first two cells, to put half the desired magic sum minus 1 in the cell in the third column and third row, and half the desired magic sum minus 8 in the fourth column of the third row. See figure 1, where the magic sum is 34, and 17 – 1 = 16, and 17 – 8 = 9. Note that the other pairs of numbers that Nīlakaṇṭha specifies, 7 and 2, 3 and 6, 5 and 4, have similar arithmetic relations to other pairs of numbers elsewhere in the square.]

The magic sum and its half are specified in the first half of the Ṛgvedic verse. "Four" (**catúraḥ**) means (a square) numbering four, [that is, of order four.] "Thirty-six" (**ṣaṭtriṃśā́n**) means numbers whose magic sum is 36. The "and" (**ca**) indicates that one must also supply other possible sums, namely 34 and 32, for a square of order four. [Nīlakaṇṭha understands the verse to allow a variable magic sum.]

"Fashioning" (**kalpáyantaḥ**). This means one should make four rows, and in each of the rows put in numerals that add up to 36.

"Up to twelve" (**ādvādaśám**). (If one counts upward following the order of the *Chandonukramaṇī* enumeration of Vedic meters,) starting from the Gāyatrī meter, (which has 24 syllables,) the twelfth type of meter enumerated is the mixed stanza Atyaṣṭi. (This verse has a total of 68 syllables, and hence, if one were to ignore the fact that this metrical form has 6 lines, and instead treat it as if it had four quarters and so divide it by four,) one would get the number 17. [Nīlakaṇṭha wants to arrive at this number because finding it in a Vedic verse provides him with the basis for finding a generative method in the Vedas, which is the method based on subtracting from half the magic sum of a square. In this case, 17 is half the magic sum of 34, the magic sum of the model square.]

On the other hand, if one instead understands the "**ā**" in "**ādvādaśám**" to mean, "this side of the twelfth," then one must understand that the verse refers to the eleventh (variety of meter in the *Chandonukramaṇī*'s enumeration,) which is to say the mixed stanza Aṣṭi meter, (which has a total of 64 syllables, and hence, by the same principle that was used for the Atyaṣṭi) gives us a number 16 to be used as half a magic sum.

If, however, one instead understands the "**ā**" in "**ādvādaśám**" to mean, "beginning from the twelfth," then we must understand that the verse refers to the thir-

teenth (variety of meter in the *Chandonukramaṇī*'s enumeration,) which is to say the mixed stanza Dhṛti meter, (which has a total of 72 syllables, and hence, by the same principle as was used for the Atyaṣṭi) gives us the number 18 to be used as half a magic sum.[10]

"Placing the meters" (**cháṃdāṃsi dádhataḥ**), means writing figures in the square that sum to the amounts indicated by each of these above-mentioned meters. In this manner, one is to subtract half the magic sum from each of the remaining figures, from 7 and 2 and so on, and write the result in the square one reaches moving by the camel step. [The uṣṭrapada appears to be a name for the movement described above, viz. down two rows and over two columns. Perhaps this is a reference to board game in which a piece called the camel moved in this way. Consider figure 1. This camel principle will work if one supposes that one has to move two rows and two columns away in whichever direction keeps the movement inside the square. For 2 and 7 this means movement up and to the left; for 3 and 6 down and to the left; for 4 and 5 up and to the right.]

Furthermore, by moving the figures 1 and 8 from their position in the initial pair of cells into other pairs of cells, and moving, in conformity with that, the other figures as well, one gets seven other variations of the square. And exchanging the position of 1 and 8, (and correspondingly exchanging the positions of the other numbers) one gets seven more variants of the square. [Here Nīlakaṇṭha indicates some ways he knows of reconfiguring the numbers in the square to produce the same desired magic sum. If one moves 1 and 8 from the first and second column of the first row, to the third and fourth column of the first row, or to the first and second column of the second row, and so on, keeping them always adjacent in the same row, other cells being filled in accordance with that initial change, one obtains seven variants. If one exchanges 1 and 8, one gets eight more variants, but Nīlakaṇṭha counts only seven. See below.]

Thus one should know that there are 14 variations. And this too is stated (in śruti.) **cáturdaśānyé mahimā́no asye**ti [*ṚV* 10.114.7a].[11] "Greatnesses" (**mahimā́no**) means perfections or powers. [Here Nīlakaṇṭha has only counted the variants, but the total number of possibilities, given the variations he has proposed adds up to sixteen, which he has juggled a bit to get fourteen, moving two possibilities down to a later stage of addition, see below, in order to find a basis in

this pāda of a Ṛgvedic verse, which is the first pāda of the subsequent verse in the same hymn, in fact.]

By writing the square with the top turned in the four different directions one multiplies the possibilities by four; hence there are 56 possibilities. These plus the eight original possibilities make up 64 different possible forms of each (four-ordered) square (of any given magic sum). [By this I think he means the original possibilities are the eight forms of the magic square starting from which the variants are generated, 1 and 8 in the first two squares, 8 and 1 in the first two squares, and so on. In order to avoid duplication with the variants already listed, I think that one would have to extend the configurations to include positioning 1 and 8 in non-adjacent cells.][12]

It is a pity that Professor Minkowski does not understand mathematical physics, for then he would immediately recognize the theoretical import of each of these numbers. Better yet, he would have profited much from a knowledge of Vedic Nuclear Physics. Analysis of these numbers lies beyond the range of the present paper but it may deserve future scrutiny.

Ṛ.V 10.114.8a

The next passage in Nīlakaṇṭha's introduction extends the principle to magic squares of order three.

> evaṃ **sahasradhā pañcadaśāny ukthe** [ṚV10.114.8a] ti mantravarṇān navakoṣṭhake 'pi | pañcapradhānāni daśāni **pañcadaśānī**ti vyutpattyā madhye pañca likhitvā parito dikṣu vidikṣu cābhimukhena **vimāye**ty atrāpy anuvartanīyaṃ | vividhayogena lekhyāni pañcadaśāni | tathā hi | prākpratīcyor ekanavakau dakṣiṇodīcyos trisaptakau | āgneyavāyavyayor aṣṭadvikau | īśanairṛtyoḥ ṣaṭcatuṣkau | madhye pañceti | atraikanavakādīnāṃ digbhedāt kramabhedāc cāṣṭāv eva navakoṣṭhakasya yantrasya bhedāḥ pratīyante | tathāpi **pañcadaśānī**ti | etasya diṅmātrapradarśanārthatvāt ṣaḍ dvādaśāni | sapta caturdaśāni | aṣṭa ṣoḍaśānīty evaṃrūpāṇi bahūni yantrāṇy ūhyānīty abhiprāyeṇa **sahasradhe**ti sahasraprakārāṇy etāni **ukthāni** | uttiṣṭhanti phalāny ebhyas tāny ukthāni tattatphalajanakāni prakṛtāni yantrāṇi jñeyāni |

[1. ukthe: uveke AS2; -varṇān: varṇāt AS1 | 2. daśāni: omits AS2 | 3. cābhimukhena: cābhimukhyena AS1 | 4. pañcadaśāni: omits AS2, SB | 6. atraika-: atreka- AS2, aneka SB | 7. nava-: naka- AS2; navakoṣṭhakasya yantrasya: tatkoṣṭhaka-yantrasya AS2 | 8. diṅ-: dig- AS2; sapta: saptadaśa AS1 | 9. bahūni yantrāṇy ūhyānī: bahūn yantrāṇy aṣṭāśī SB, bahūn yantrāṇy ūhyānī AS1, bahūn yantrāṇy uktāni AS2 | 10. ukthāni: ucasaṃkhyakāni AS2, uvaśāni SB |]

In the same manner, because of the direct statement of the śruti: **sahasradhā́ pañcadaśā́ny ukthā́** [ṚV 10.114.8a],[13] there is also a Vedic basis for the creation of magic squares of order three.

The 2 x 3 Luo Shu Magic Square

If we etymologize **pañcadaśā́ni** as meaning "tens predominated by five," then we understand that one places 5 in the center (of a nine-celled square) and (the numbers as listed below) in the cells around it, in the four directions and intermediate directions facing it—once we understand that the term **vimā́ya** should be brought down from verse 6 above—that is, measuring out with a varied arrangement, the numbers should be written in the following manner:

In the east and west squares place 1 and 9; in the south and north cells 3 and 7. In the southeast and the northwest one draws the 8 and 2. In northeast and southwest one draws 6 and 4. And 5 in the center.

Now here, there are eight varieties of nine-celled square, because of the different directions in which the square is faced, and because of the different order, [i.e. produced by flipping the square over.] And this is why (in the Ṛgvedic verse 10.114.8a), when it says **pañcadaśāni**, because that is for the purpose of showing merely a direction, one must understand that many magic squares are to be supplied, and similarly one has to understand here 6 (variants for) 12, 7 (variants for) 14, 8 (variants for) 16. With this in mind the Ṛgvedic verse says "thousand-fold" (**sahasradhā́**), for of a thousand varieties are these **ukthā́ni**. **Ukthā́ni** means that from which results arise, and one should therefore understand that various results arise from these various base diagrams. [I am not sure of Nīlakaṇṭha's intention in giving the pairs 6, 12; 7, 14; and 8, 16. Obviously these are numbers and their doubles. I think the latter number in each pair is a magic sum, and the first number is perhaps the number of series of nine numbers that Nīlakaṇṭha thinks he can generate to produce each sum, assuming certain constraints. Unfortunately the usual constraints would prevent one from having a magic sum not divisible by three in a magic square of order three. Thus my explanation is plausible for 6, 12, but will not work for 7, 14 and 8, 16, unless Nīlakaṇṭha is in error here.]

Śarabha and Tantric Uses of Squares

Nīlakaṇṭha's demonstration, therefore, of the Vedic basis for the construction and inscription of magic squares, depends on two consecutive verses from *Ṛgveda* 10.114. Having made his point, Nīlakaṇṭha proceeds with his argument by showing that the numbers that one writes in a square of order four, (that is, the numbers 1 to 16), are all regularly used to refer to groups of deities and that in turn, the practitioner of number diagram magic thinks of the gods so indicated while writing the numbers in his square, and thereby receives their blessings.

In the following passage Nīlakaṇṭha makes a further appeal to Vedic verses as the basis for drawing magic squares. This is done by bringing in a different tantric context, the ritual associated with the deity Śarabha, a form of the tantric deity

Ākāśabhairava, whose name is associated with various forms of magic.[14] Space does not permit a full description of this part of Nīlakaṇṭha's text here, but a short summary will be useful, since Vedic verses appear in the argument again.

Nīlakaṇṭha shows that one can extract the magic square associated with Śarabha from a Vedic verse, in particular from *Taittirīyāraṇyaka* III.15.1.[15] This verse, says Nīlakaṇṭha, is used as the basis for the Śarabha myth.[16] By applying the kaṭapayādi system and interpreting other words in the verse as instructions to figure things out using one's intelligence, the verse is shown to prescribe an unusual magic square of order three, in which the central square has four numbers in it instead of one. This unusual magic square is perhaps appropriate for a deity called "śarabha," which is the name of a legendary eight-legged animal. In the Śarabha diagram the sorts of additions possible are multiplied, but are also restricted. The magic sum is 20, and it is reached by adding any outer side, or any diagonal, or the outer or inner four corner cells, or the pairs of opposite cells, or each of the sides with the interior adjacent corners, and so on.

Nīlakaṇṭha generates the same unusual magic square from half of a Ṛgvedic verse, *ṚV* 8.100.06,[17] the only verse in the *Ṛgveda* that contains the word "śarabha." This verse is central to the sort of Vedicizing tantric ritual associated with Śarabha and Ākāśabhairava in the *Ākāśabhairavakalpa*.[18] Nīlakaṇṭha's ability to derive the Śarabha magic square from this verse is therefore doubly confirming. The method he uses is to read the entire verse in the kaṭapayādi mode, and to place the numbers so derived in their appropriate positions in the square. The following passage of Nīlakaṇṭha's text generates a square with the magic sum of 34 in the same Śarabha configuration. No Vedic passage is invoked to support this square.

Conclusion

With this final possibility, Nīlakaṇṭha declares his argument successful in proving the point that tantric number diagrams, as forming a proper part of the Vedic canon, deserve to be studied and commented on. The unusual strategy of using the kaṭapayādi system for reading the meanings of Vedic verses enables him to show, at least to his own satisfaction, that the Vedas explicitly prescribe the drawing of magic squares; and that they do not prescribe just one square, but the whole art of generating magic squares, as this art was known to Nīlakaṇṭha.

Madhava's Sine Table

is the table of trigonometric sines of various angles constructed by the 14th century Kerala mathematician-astronomer Madhava of Sangamagrama. The table lists the trigonometric sines of the twenty-four angles 3.75°, 7.50°, 11.25°, ..., and 90.00° (angles that are integral multiples of 3.75°, i.e. 1/24 of a right angle, beginning with 3.75 and ending with 90.00). The table is encoded in the letters of Devanagari using the Katapayadi system. This gives the entries in the table an appearance of the verses of a poem in Sanskrit. Madhava's original work containing the sine table has not yet been traced. The table is seen reproduced in the *Aryabhatiyabhashya* of Nilakantha Somayaji (1444–1544) and also in the *Yuktidipika/Laghuvivrti* commentary of Tantrasamgraha by Sankara Variar (circa. 1500-1560). [1]

Comparison of Madhava's and modern sine values[edit]

In table below the first column contains the list of the twenty-four angles beginning with 3.75 and ending with 90.00. The second column contains the values tabulated by Madhava in Devanagari in the form in which it was given by Madhava. (These are taken from *Malayalam Commentary of Karanapaddhati* by P.K. Koru[2] and are slightly different from the table given in *Cultural foundations of mathematics* by C.K. Raju.[1]) The third column contains ISO 15919 transliterations of the lines given in the second column. The digits encoded by the lines in second column are given in Arabic numerals in the fourth column. The values of the trigonometric sines derived from the numbers specified in Madhava's table are listed in the fifth column. These values are computed using the approximate value 3.1415926535922 for obtained by Madhava. For comparison, the exact values of the trigonometric sines of the angles are given in the sixth column.

0	Madhava's numbers for specifying sin A			Value of sin A derived from Madhava's table	Modern value of sin A
	in Devanagari script using Katapayadi system (as in Madhava's original table)	in ISO 15919 transliteration scheme	Arab		
(1)	(2)	(3)	(4)	(5)	(6)
03.75	□ હિ૧ બુલ સૂવહુ બષ્ટ	re h n ma vari h n	22 05 4220	0.0654031 4	0.0654031 3
07.50	ૂી લ્લૂ ન્નસુપર્ ુસબઅ	him drirv dab h vana	85 24 8440	0.1305262 3	0.1305261 9
11.25	ધભ્મબ૧ ર્ ુબૈં િક્ત્મા□ ૧	tapan bh nu s ktajñ	61 04 0760	0.1950903 2	0.1950903 2
15.00	લફૂળલ્લ ૂસૌંપૂ પવી બ્લ	maddhyama viddhi d hana	51 54 9880	0.2588190 0	0.2588190 5
18.75	ૂફ ચુઠેળ૧ બુહ્લબ ધસ્ર	dhig jy n ana ka a	93 10 5011	0.3214394 7	0.3214394 7
22.50	ઞક્રાર ઋુહળષ્ટૂય ધુ	channabh g ay bik	70 43 5131	0.3826834 0	0.3826834 3
26.25	લૅંચુી ુવ૧ બવ્રહ ળા	mr g h r nar ya	53 82 0251	0.4422886 5	0.4422886 9
30.00	સે વ૧ વદ ટ ળઋિંધઅ	v r ra ajay tsuka	42 25 8171	0.4999999 8	0.5000000 0
33.75	લૅંશ્લ ૂસહૈંપૂ બુષ હ્લળ	m la vi uddha n asya	53 45 9091	0.5555702 2	0.5555702 3
37.50	ચુબૂૈ ૂસવષુ બવુઅ	g ne u vira nar	30 64 2902	0.6087613 9	0.6087614 3
41.25	અહૈંપૂચૈંત્રુ ઝઋ□ ેઅ	a uddhigupt c ra r	05 93 6622	0.6593458 0	0.6593458 2
45.00	હલ્લ્ધૈંધદીં બધૃ□ વઅ	a kukar nage vara	51 15 0342	0.7071068 1	0.7071067 8
48.75	ધબૅટ ૧ ચર્ટ ૧ ૌંલ□ લ્લ	tan j garbhaj	60 83 4852	0.7518398 5	0.7518398 1

		mitra			
52.50	□ ેલુબ□ િંડ ેિખૂ	r m natra sukh sakh	25 02 7272	0.7933533 1	0.7933533 4
56.25	હહે વુ□ ૨ૂીલુીુવર	a r trou him h rou	55 22 8582	0.8314696 0	0.8314696 1
60.00	ાચ□ અભૂન ૂિક્રૈંવઅ	v gajña pathi sindhura	43 01 7792	0.8660254 3	0.8660254 0
63.25	ઞુળુ શળા૧ચટ ા૧બેશ૧	ch ya lay gaj n l	71 31 3803	0.8968727 5	0.8968727 4
67.50	ૂબલૃશ૧બુોંહ્વ િશ્ક્રોંશ	nirmal n sti salkul	05 30 6713	0.9238795 4	0.9238795 3
71.25	વુ□ ૨પભૃદ્ લયે ષ્ટ્યુ	r trou darpa amabhr ga	22 81 5523	0.9469301 6	0.9469301 3
75.00	બુચહ્વૈંચ બઙ ા૧યશે	n gastu ga nakh bal	03 63 0233	0.9659258 1	0.9659258 3
78.75	ફે વા૧ૌંસુ ધનુશજ્ઞાઅ	dh r yuv kath l la	92 14 1733	0.9807852 7	0.9807852 8
82.50	ભૅઠેળા૧બુવે ટબૂરૃચુઅ	p jy n r janairbhag	11 02 8043	0.9914448 7	0.9914448 6
86.25	ધઞાુચુવ્ર બુચસશ્ચા	kany g r n gavall	11 32 0343	0.9978589 5	0.9978589 2
90.00	ધ્રસા૧ૂસ□ હ્નશે રૅંચૈંઅ	dev vi vasthal bhr gu	84 44 7343	0.9999999 7	1.0000000 0

Madhava's method of computation

No work of Madhava detailing the methods used by him for the computation of the sine table has survived. However from the writings of later Kerala mathematicians like Nilakantha Somayaji (Tantrasangraha) and Jyeshtadeva (Yuktibh) that give ample

references to Madhava's accomplishments, it is conjectured that Madhava computed his sine table using the power series expansion of sin *x*.

Angle A in degrees	**Madhava's numbers for specifying sin A**			**Value of sin A derived from Madhava 's table**	**Modern value of sin A**
	in Devanagari script using Katapayadi system (as in Madhava 's original table)	**in ISO 15919 transliteration** scheme	**in Arabic numerals**		
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
03.75		re h n ma vari h n	22 05 4220	0.065403 14	0.06540313
07.50		him drirv dabh v ana	85 24 8440	0.130526 23	0.13052619
11.25		tapan bh nu s ktajñ	61 04 0760	0.195090 32	0.19509032
15.00		maddhya ma viddhi d hana	51 54 9880	0.258819 00	0.25881905
18.75		dhig jy n ana ka a	93 10 5011	0.321439 47	0.32143947
22.50		channab h g ay bik	70 43 5131	0.382683 40	0.38268343
26.25		mr g h r	53 82	0.442288	0.44228869

		nar ya	0251	65	
30.00		v r ra ajay t suka	42 25 8171	0.4999998	0.50000000
33.75		m la vi uddha n asya	53 45 9091	0.5555702	0.55557023
37.50		g ne u vira nar	30 64 2902	0.6087613	0.60876143
41.25		a uddhig upt c ra r	05 93 6622	0.6593458	0.65934582
45.00		a kukar nage var a	51 15 0342	0.7071068	0.70710678
48.75		tan j garbhaj mitra	60 83 4852	0.7518398	0.75183981
52.50		r m natr a sukh sakh	25 02 7272	0.7933533	0.79335334
56.25		a r trou him h ro u	55 22 8582	0.8314696	0.83146961
60.00		v gajña pathi sindhura	43 01 7792	0.8660254	0.86602540
63.25		ch ya lay gaj n l	71 31 3803	0.8968727	0.89687274
67.50		nirmal n sti salkul	05 30 6713	0.9238795	0.92387953
71.25		r trou darpa a mabhr ga	22 81 5523	0.9469301	0.94693013
75.00		n gastu g a	03 63 0233	0.9659258	0.96592583

		nakh bal			
78.75		dh r yuv kath l la	92 14 1733	0.980785 27	0.98078528
82.50		p jy n r janair bhag	11 02 8043	0.991444 87	0.99144486
86.25		kany g r n gavall	11 32 0343	0.997858 95	0.99785892
90.00		dev vi vastha l bhr gu	84 44 7343	0.999999 97	1.00000000

Conclusion

In his 21st Century ignorance, Minkowski fails to understand that Magic Squares form a key component of natural processes in the formation of matter (please refer to numerous papers by this author on the Vixra server which articulate this point). Instead, Minkowski assumes Magic Squares have no more mathematical value than parlour games. Nilakantha, he writes, can offer a proof merely for "his own satisfaction," without comprehending that such proofs would have been accepted, and indeed continue to be accepted, in ancient India and in India today.

"One is the phenomenon of the re-use of Vedic mantras in tantric settings. Nīlakaṇṭha's incorporation of the Vedic mantras associated with the Śarabha rituals is evidently motivated by his awareness that, by his day, Vedic mantras had long since escaped from their śrauta and g¿ hya ritual contexts, and were found in ritual employments in many smārta and tantric practices.[19]

India today holds at least one Tantric temple which houses 64 yoginis. These 64 yoginis form an isomorphic relationship to the 64 amino acids of DNA, as well as to the 64 hexagrams of the I Ching, and conform perfectly to the 8 x 8 = 64 stable Satvic form of matter in the Universe. Small wonder that by Nilakantha's day, these had become objects of Tantric devotion, even if the original Vedic knowledge had been forgotten by that era.

"Another is that Nīlakaṇṭha has located a window of plausibility, as it were, that gives him access to the Veda through its various numerical and enumerative modes. Nīlakaṇṭha is correct to say that the Ṛgveda has passages that articulate cardinal numbers, and others that speak of enumerable deities; and that in the Vedic traditional corpus there are canonical lists of meters (and sages, and deities,) that imply ordinal numbers. There are, indeed, many sets of symbols that lend themselves to numerical abstraction and mental play."

Given the limited speciality of contemporary academics, we can perhaps excuse Minkwoski for not understanding the Neters of Ancient Egypt. The neters were numbers, which the Egyptians held as gods. In addition to numerical values, they contained archetypes. An author of a recent book on Vedic Nuclear Physics explains such advanced concepts as particle physics of bosons and quarks in the language of traditional Hindu deities.

Nilakantha's work holds the secret to de – coding the Vedas, as Srinivasan and Chand Sharma have done for Vedic Nuclear Physics. If Nilakantha was able to

decode Magic Squares, then logically that means that the authors of Sanskrit and the Vedas inscribed those Magic Squares into the original, or that the Magic Squares formed part of the Vedic oral tradition that came prior to the written Vedas. A further implication is that the katyapada system existed at least at the time of the writing of the Vedas, which had to have been at least 13,000 years ago, before the last great series of Earth Changes.

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Wikipedia

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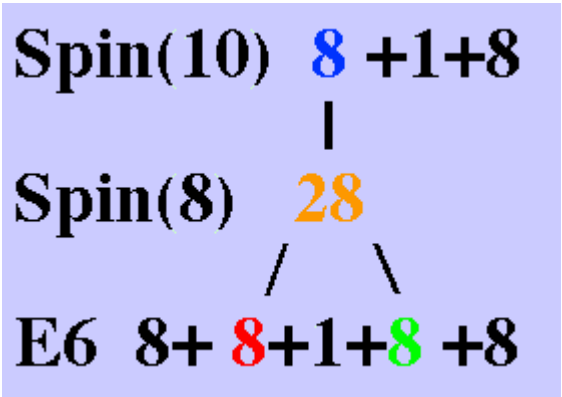
Appendix

Rig Veda analyzed in math physics terms by Frank Tony Smith

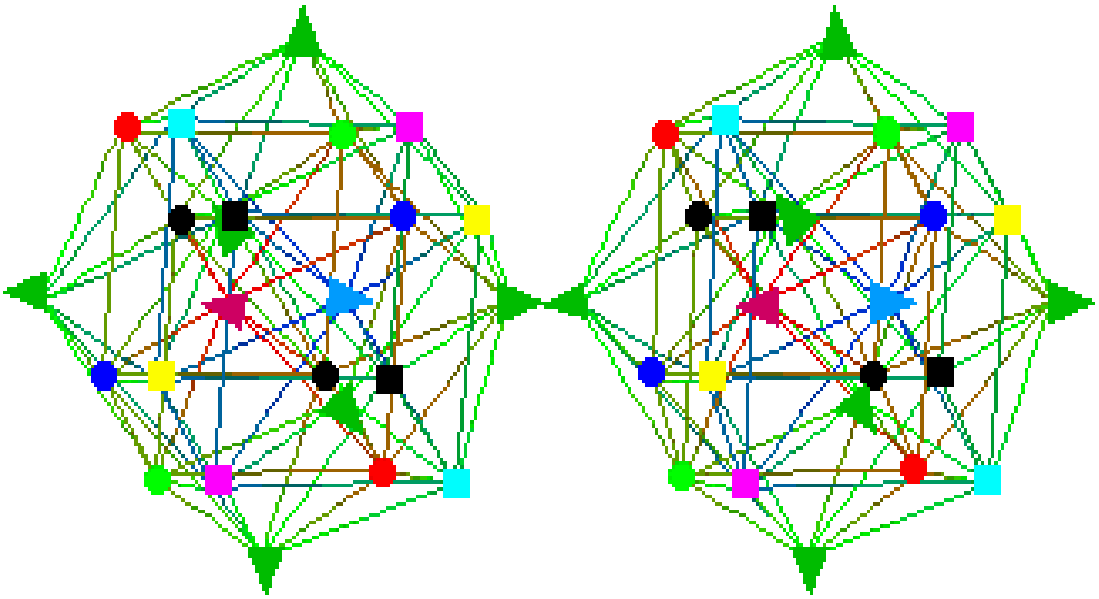
According to a Hindu Universe web site, the Rig Veda begins with 1 Madala, 1 Astaka, 1 Adhyaya, Sukta 1:

ॐ अग्निमीळे पुरोहितं यज्ञस्य देवमृत्विजम् । होतारं रत्नधातमम् ॥ 1 ॥
अग्निः पूर्वेभिर्ऋषिभिरीड्यो नूतनैरुत । स देवाँ एह वक्षति ॥ 2 ॥
अग्निना रयिमश्नवत्पोषमेव दिवेदिवे । यशसं वीरवत्तमम् ॥ 3 ॥
अग्ने यं यज्ञमध्वरं विश्वतः परिभूरसि । स इद्देवेषु गच्छति ॥ 4 ॥
अग्निर्होता कविक्रतुः सत्यश्चित्रश्रवस्तमः । देवो देवेभिरा गमत् ॥ 5 ॥
यदङ्ग दाशुषे त्वमग्ने भद्रं करिष्यसि । तवेत्तत्सत्यमङ्गिरः ॥ 6 ॥
उप त्वाग्ने दिवेदिवे दोषावस्तर्धिया वयम् । नमो भरन्त एमसि ॥ 7 ॥
राजन्तमध्वराणां गोपामृतस्य दीदिविम् । वर्धमानं स्वे दमे ॥ 8 ॥
स नः पितेव सूनवेऽग्ने सूपायनो भव । सचस्वा नः स्वस्तये ॥ 9 ॥

Note the structure of 1 first line, followed by 8 lines, each with 8+8 = 16 Sanskrit syllables left of the | line and 8 Sanskrit syllables right of the | line, for a total of 24 Sanskrit syllables per line. Note that the three sets of eight syllables correspond to



the 8 first generation fermion particles, the 8 first generation fermion antiparticles, and an 8-dimensional spacetime in the D4-D5-E6-E7-E8 VoDou Physics model, and all 24 form the vertices



of a 24-cell. They may further represent the 24 Hurwitz Quaternions (author's note).

According to The Constitution of the Universe by Maharishi Mahesh Yogi, printed in newspapers including The Sunday Times (15 March 1992), The Sunday Telegraph (15 March 1992) Financial Times (16 March 1992), The Guardian (16 March 1992), The Wall Street Journal (6 January 1992), and The Washington Post (9 January 1992), a copy of which was sent to me in pamphlet form by John Small in August 2003:

"... modern science has systematically revealed deeper layers of order in nature, from the atomic to the nuclear and subnuclear levels of nature's functioning ...

... the ancient Vedic wisdom ... identifies a single, universal source of all orderliness in nature ...

Both understandings, modern and ancient, locate the unfied source of nature's perfect order in a single, self-interacting field of intelligence at the foundation of all the laws of nature. ... The self-interacting dynamics of this unified field constitutes the most basic level of nature's dynamics ... The laws governing the self-interacting dynamics of the unified field can therefore be called the **Constitution of the Universe** ... In Maharishi's Vedic Science, ... the Constitution of the Universe ... is embodied in the very structure of the sounds of the Rik Ved,

the most fundamental aspect of the Vedic literature ... According to Maharishi's Apaurusheya Bhashya, the structure of the Ved provides its own commentary - a commentary which is contained in the sequential unfoldment of the Ved itself in its various stages of expression. The knowledge of the total Ved ... is contained in the first sukt of the Rik Ved, which is presented below [and is also shown above, all on one line]:

Ahamkar	Buddhi	Manas	Akash	Vayu	Agni	Jal	Prithivi
अ॒क्	नि	मी॑	ळे	पु॒	रो	हि॑	तं
AK	NI	MI	LE	PU	RO	HI	TAM
अ॒	म्रिः	पू	वँ॑	भि॒ः	ऋ॒	षि॑	भि॒
अ	मि॒	नो॑	र॒	यि	मं॑	श्न	व॒
अ	मे॒	यं	य॒	ज्ञ	मं	ध्व॒	रं
अ॒	मिर्	हो	तो॑	क॒	वि	क्रं॑	तु॒ः
य	दु॒	ङ्गं	दा॒	शु	षे॒	तु	वं॑
उ	पं॑	त्वा	ग्रे	दि॒	वे	दि॑	वे॒
रा	ज॑	न्त	म	ध्व॒	रा	णां॑	गो॒
स	नः॑	पि॒	ते	वं॑	सू	न	वे

Ahamkar	Buddhi	Manas	Akash	Vayu	Agni	Jal	Prithivi
य	ज्ञ	स्यं	दे	व	मृ	त्वि	जंम्
YA	GYA	SYA	DE	VA	MRI	TVI	JAM
री	ड	यो	नू	तं	नै	रु	त
त्पो	षं	मे	व	दि	वे	दिं	वे
वि	श्च	तः	प	रि	भू	र	सिं
सु	त्यश्	चि	त्र	श्रं	व	स्त	मः
ऋ	ग्रें	भु	द्रं	क	रि	ष्य	सिं
दो	षां	व	स्तर्	धि	या	वु	यम्
पा	मृ	त	स्यु	दीं	दिं	वि	म्
ऋ	ग्रैं	सू	पा	यु	नो	धं	व

Ahamkar	Buddhi	Manas	Akash	Vayu	Agni	Jal	Prithivi
हो	तां	रं	र	त्नु	धा	तं	मम्
HO	TA	RAM	RA	TNA	DHA	TA	MAM
स	दु	वाँ	ए	ह	वं	द्म	ति
यु	श	सं	वी	र	वं	त्त	मम्
स	इ	दु	वें	षु	ग	च्छ	ति
दु	वो	दु	वे	भि	रा	गं	मत्
त	वेत्	तत्	सु	त्य	मं	ङ्गि	रः
न	मो	ध	रं	न्तु	ए	मं	सि
व	धं	मा	नं	सु	वे	द	में
स	चं	सु	आ	नः	स्व	स्त	यें

... The precise sequence of sounds is highly significant; it is in the sequential progression of sound and silence that the true meaning and content of the Ved reside - not on the level of intellectual meanings ascribed to the Ved in the various translations.

The complete knowledge of the Ved contained in the first sukt (stanza) is found in the first richa (verse) - the first twenty-four syllables of the first sukt (stanza 1). This complete knowledge is again contained in the first pad, or first eight syllables of the first richa, and is found in the first syllable of the Ved, 'AK', which contains the total dynamics of consciousness knowing itself. [compare the 64 hexagrams of the I Ching which come from the 8 trigrams which in turn come from Yin-Yang]

According to Maharishi's Apaurusheya Bhashya of the Ved,

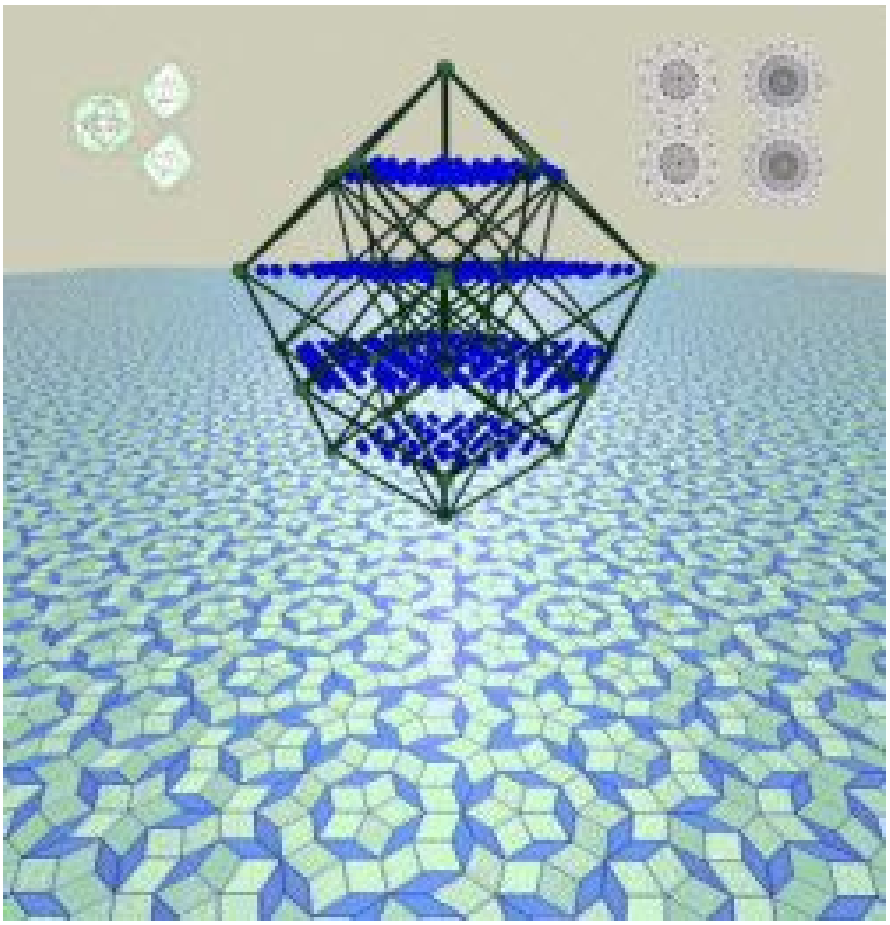
- 'AK' describes the collapse of the fullness of consciousness (A) within itself to its own point value (K). [compare the quantum decoherence/collapse of superpositions of tubulin elecctron states in the formation of a thought in the human brain] This collapse, which represents the eternal dynamics of consciousness knowing itself, occurs in eight successive stages.
- In the next stage of unfoldment of the Ved, these eight stages of collapse are separately elaborated in the eight syllables of the first pad, which emerges from, and provides a further commentary on, the first syllable of Rik Ved, 'AK'. These eight syllables correspond to the eight 'Prakritis' (Ahamkar, etc.) or eight fundamental qualities of intelligence ...[compare the 8-dimensional real Clifford algebra of the D4-D5-E6-E7-E8 VoDou Physics model and its 8-fold Periodicity leading to a Clifford Tensor Product Universe]...
- The first line, or 'richa', of the first sukt, comprising 24 syllables, provides a further commentary on the first pad (phrase of eight syllables);
    - The first pad expresses the eight Prakritis ... with respect to the knower ... observer ... or 'Rishi' quality of pure consciousness.
    - The second pad expresses the eight Prakritis with respect to the process of knowing ... process of observation ... of 'Devata' (dynamism) quality of pure consciousness.
    - The third pad expresses the eight Prakritis with respect to the known ... observed ... or 'Chhandas' quality of pure consciousness. ... [compare the 3 pads with Triality]

- The subsequent eight lines complete the remainder of the first sukt - the next stage of sequential unfoldment of knowledge in the Ved. These eight lines consist of 24 padas (phrases), comprising 8x24 = 192 syllables. [compare the 192-element Weyl group of Spin(8), whose root vector polytope is the 24-cell, and whose Lie algebra comes from the bivectors of the Cl(8) Clifford Algebra] ... these 24 padas of eight syllables elaborate the unmanifest, eight-fold structure of the 24 gaps between the syllables of the first richa (verse). ... Ultimately, in the subsequent stages of unfoldment, these 192 syllables of ther first sukt (stanza) get elaborated in the 192 [?or is it 191?] suktas that comprise the first mandal (circular cyclical eternal structure) of the Rik Ved, which in turn gives rise to the rest of the Ved and the entire Vedic literature. ...".

Note that

- the first richa of the first sukt has 24 syllables plus 24 gaps (if you include a silent gap at the beginning/end to close the first sukt into a circle) and
- those 24 gaps are made relevant by being elaborated by the following 8 richas of the first sukt, which have 192 syllables

so that **the total number of relevant entities in the first sukt is 24+24+192 = 240**, which is the number of vertices of



the root vector polytope of the E8 Lie algebra.

Since the E8 Lie algebra has rank 8, it has dimension 240+8 = 248, and the 2^8 = 256-dimensional real Clifford algebra Cl(8) (or Cl(1,7) if you pay attention to signature) can be constructed as

Cl(8) = E8 + 8-dimensional vector space.

Therefore:

The first Sukta of the Rig Veda - 1 Madala, 1 Astaka, 1 Adhyaya, Sukta 1:

ॐ अग्निमीळे पुरोहितं यज्ञस्य देवमृत्विजम् । होतारं रत्नधातमम् ॥ 1 ॥
अग्निः पूर्वेभिर्ऋषिभिरीड्यो नूतनैरुत । स देवाँ एह वक्षति ॥ 2 ॥
अग्निना रयिमश्नवत्पोषमेव दिवेदिवे । यशसं वीरवत्तमम् ॥ 3 ॥
अग्ने यं यज्ञमध्वरं विश्वतः परिभूरसि । स इद्देवेषु गच्छति ॥ 4 ॥
अग्निर्होता कविक्रतुः सत्यश्चित्रश्रवस्तमः । देवो देवेभिरा गमत् ॥ 5 ॥
यदङ्ग दाशुषे त्वमग्ने भद्रं करिष्यसि । तवेत्तत्सत्यमङ्गिरः ॥ 6 ॥
उप त्वाग्ने दिवेदिवे दोषावस्तर्धिया वयम् । नमो भरन्त एमसि ॥ 7 ॥
राजन्तमध्वराणां गोपामृतस्य दीदिविम् । वर्धमानं स्वे दमे ॥ 8 ॥
स नः पितेव सूनवेऽग्ने सूपायनो भव । सचस्वा नः स्वस्तये ॥ 9 ॥

contains the structure of both:

[the D4-D5-E6-E7-E8 VoDou Physics model]; and

[the 256-element structure of IFA = VoDou].

In my opinion, the Rig Veda may be the earliest reduction to writing of the original African-based orally transmitted early global wisdom of IFA = VoDou, and, as the earliest, it may be the most nearly complete written description of that wisdom.

Note here how Smith supports the idea that the Rig Veda was the first reduction to writing of early global wisdom the global culture shared by ancient Egypt and the people of the Vedas, who occupied polar Siberia before the last great natural disaster of Pole Shift and the Great Floods.

Please note further that Smith mentions the Sanskrit word “Prakriti” (Prakrithi) without realizing that this term holds special significance in Vedic Nuclear Physics as a part related to the nuclear core, which western science has yet to discover.

Dedication

Some men see things as they are, and ask, why?

I see things that never were, and ask, why not?

So let us dedicate ourselves to what the Greeks wrote so long ago;

To tame the savageness of man and to make gentle the life of this world.

Robert Francis Kennedy