



Logic and Correct Mindset any Peace-making Leaders Must Acquire

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ABSTRACT

Global leadership for sustainable peace is a colossal task for great minds who can think outside the box. The complexities of global conflict are multifaceted. Traditional Buddhist mindfulness training such as various meditation techniques are designed to discipline the mind to concentrate and focus. Such disciplines fall short of providing political leaders the necessary mind set to comprehend complex problems and see many solutions. I expand the traditional definition of “mindfulness” to reveal the hidden teachings on logic systems buried in various sutras over millennium. In particular, non-duality logic and quadratic category logic are expounded. Conflict arises when the mind fails to perceive both sides of the story. This mental block can be overcome by non-duality logic. Quadratic category logic opens up the mind to unseen possibilities by considering and conceiving contexts in 4 categories: yes, no, both yes and no, both not yes and not no. The gold mine of Buddhist logic is unearthed here to serve as critical thinking tools.

Non-duality logic and Quadratic category logic began in the Cūla-Mālunkya-sutta when Malunkyaputta posted 10 questions which Shakyamuni declined to answer; henceforth known as the 10 inexpressible but 14 such questions exist in later Agama Sutra. The 10 are: (1) the world is eternal or (2) it is not eternal, (3) the cosmos is finite or (4) it is not finite, (5) soul is the same as body or (6) soul is one thing and body another thing, (7) the Tathāgata exist after death 是, or (8) he does not exist after death 非, or (9) he both (at the same time) exist 是 and not exist after death 非, or (10) he both (at the same time) not exist 非是 and not not-exist after death 非非. The first 6 are actually 3 pairs of dualities while the last 4 compose a quadratic structure.

Around 750 years after Shakyamuni, Nāgārjuna began his “Fundamental Verses on the Middle Way” (Mulamadhyamakakarika) with 8-NOT’s “...Not born and not annihilated; Not permanent and not continuous; Not single and not various; Not coming and not going...” These 8-NOT’s can be viewed as 4 pairs of non-dualities. Significantly, each pair takes up the quadratic structure of the 10th inexpressible “does he both (at the same time) not exist and not not-exist”.

During 557-715 AD the 1st through the 3rd Patriarch of the Avatamsaka School classified the Buddha’s teachings into 5 designations: Hinayana, Mahayana Beginning, Mahayana Final, Sudden, and Mahayana Complete. The Chán (Zen) School which preaches Sudden Awakening refuted the effectiveness of the Avatamsaka designations. A Chán master openly debated the Avatamsaka School master in the presence of the 8th Emperor Huizong (宋徽宗 1082 – 1135AD) of the Song Dynasty and his Chief of Staff. The Chán master shouted once and then began to illustrate how the one shout permeated all 5 Avatamsaka designations of Buddhist teachings. He used a rhetoric based entirely on quadratic category logic and accomplished a glorious victory.

Realizing the detrimental mental block when one fails to comprehend the quadratic category logic, the 1950 Nobel Laureate Bertrand Russell told the world to contemplate on the “barber paradox”.

It is high time I decipher these mental contests spanning from Shakyamuni to Bertrand Russell by using simple Venn Diagrams. Learning the Buddhist non-duality logic and quadratic logic would

help to attain correct mindfulness that pierce into infinite possibilities. Significantly, the Buddhist quadratic category logic is distinct from the category logic of Aristotle (384-322 BC).

Key Words: Buddhist quadratic category logic, non-duality.

INTRODUCTION

A. The emergence of category logic

What is truth? An operational definition could be an accurate and thorough description of reality. The metaphor “Blind men and the elephant” speaks to the common mental inadequacies to describe reality accurately and thoroughly. To seek truth, we must acknowledge as many facts and discover as many propositions as possible, i.e. the blind men must be in touch with as many areas of the elephant as possible. If the areas of an elephant are divided into two categories, front or back, this is dualistic thinking. Duality is how we learn to know our world. We perceive realities in contrasting pairs: yes/no, light/dark, hungry/full, hot/cold, life/death, good/evil, samsara/nirvana, finite/infinite, etc. Non-duality is to embrace both front and back, yes and no, viewpoints.

Besides the three viewpoints of front, back, both front and back, there are other viewpoints such as left-side, right-side, top, bottom, which maybe collectively designated as “neither front nor back”. We now have a total of 4 categories of viewpoints: Yes; No; Both yes and no (non-duality); Neither yes nor no. This is the meaning of quadratic category logic, a tool to overcome the common mental limitations in pursuit of the truth. This thinking tool forces the mind to systematically discover the contents in each category and acknowledge the facts that these categories exists.

B. Time line on the developments of category logic systems

The incredibly long timeline (Fig 1) for the development of the aforementioned logic systems indicates how slow the progress and how difficult the thought experiments have been. It should



not be surprising to find many of our best and brightest predecessors had fallen into logical pitfalls along this rough intellectual journey. This monumental task is finally completed and elucidated in this article. Historic contributions of our predecessors will be presented chronologically according to the mind map in Fig 1.

Fig 1. Time line on the developments of category logic systems

DEVELOPMENT OF CATEGORY LOGIC SYSTEMS

1 Ten Inexpressible in Agama Sutra

The concept of category logic first emerged in early Buddhism but its intellectual value has been largely ignored. A disciple by the name Malunkyaputta (鬘童子) posed ten questions (paraphrased in the Abstract) to Shakyamuni (563~480 BC). He asked the Buddha to either provide definite answers or to admit honestly that the Buddha himself did not know. The Buddha refused to answer. We assume Shakyamuni would be around 30-40 years old when this happened and thus assigned a speculative date of ~526 BC. The unanswered questions became known as the Ten Inexpressible [http://en.wikipedia.org/wiki/The_unanswered_questions] or undeclared questions (Sanskrit avyākṛta, Pali: avyākata – “unfathomable, un-expounded”). Another Pali term is Acinteyya [<https://en.wikipedia.org/wiki/Acinteyya>] commonly translated as imponderable or incomprehensible. The Theravada tradition recorded the story in Pali in the Agama Sutra Majjhima Nikaya canon 61, Cūla-Mālunkya-sutta (1998). The Buddha responded to Malunkyaputta’s 10 questions with the poison arrow metaphor. When a man is injured by a poison arrow, he should seek medical treatment immediately. He should not waste time asking irrelevant question such as who shot the arrow, what is his cast, his skin colour, his height, where is he from...which type of bow and bow string... etc. The Buddha considered metaphysical questions unrelated to, and created distractions from, the spiritual practices leading to enlightenment. Although this traditional interpretation is indisputable, the author begs to differ and wishes to disclose hidden treasures in this lesson.

Firstly, it should be obvious that the first 2 questions are deliberately written as a pair of dualities. Conceivably, no languages in the world would ask questions in such clumsy, redundant grammar. It goes without saying for the rest of the 8 questions. Instead of asking “Have you had breakfast?” Malunkyaputta stated “1) You had breakfast. 2) You did not have breakfast.” These are position statements. Therefore, question marks “?” should be removed at the end of all of Malunkyaputta’s 10 statements. Malunkyaputta was asking the Buddha to take a position regarding each statement.

Secondly, the first 6 questions were 3 pairs of dualities. Let “A” represent the first statement and “B” the second statement. If the answer to “A” is affirmative, then the answer to “B” must be negative. The propositions “A” and “B” are mutually exclusive. One has to take a position between the two propositions or categories. Thirdly, Malunkyaputta structured his last 4 questions in a quadratic format; affirmative, negative, both affirmative and negative, neither affirmative nor negative. Malunkyaputta designed 4 positions or categories. Quadratic category logic was born.

Fourthly, Malunkyaputta’s statement #9 “The Tathāgata both exist 是 and not exist 非 after death.” takes the form of affirmative to both “A” and “B” meanwhile “A” and “B” are supposed to be mutually exclusive. This is the birth of the non-duality concept of embracing opposites 亦是亦非.

Fifthly, Malunkyaputta’s statement #10 takes the form of negative to both “A” and “B” meanwhile “A” and “B” are supposed to be mutually exclusive. This is the birth of thinking outside the “A” and “B” boxes 亦非是亦非非.

Malunkyaputta’s mind-boggling syntax can be elucidated by a Venn diagram (Fig 2). He structured his first 6 questions as 3 pairs of dualistic categories. His last 4 questions were in the format of quadratic categories logic i.e. 4 viewpoints. In Fig 2, “No” can be substituted by “Not-yes”, “Both” substituted by

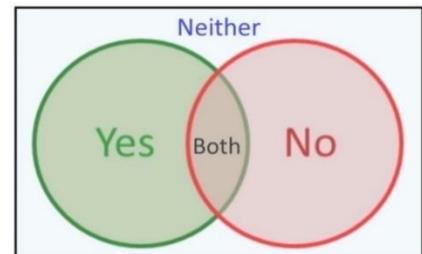


Fig 2. Venn diagram depicting Buddhist quadratic

“Non-duality”. The label “Neither” can be substituted by “Not-yes and Not-no”. Its area is outside the “Yes” “No” “Both” thinking boxes.

Perhaps the best part of Malunkyaputta’s so called questions were his intention to invent category logic as a tool to not only guide the mind to lay out all possibilities but also to force the mind to systemically consider/imagine the content and meanings in each possible category. The metaphysical nature of his questions was probably insignificant. He would be silly to ask the Buddha “(1) You had breakfast. (2) You did not have breakfast. (3) You both had and not had breakfast. (4) You neither had nor not had breakfast”. So, Malunkyaputta might just as well ask something meaningful.

The 14 inexpressible were written in the following format:

Questions concerning the existence of the world in time

1. Is the world eternal?
 2. ...or not?
 3. ...or both?
 4. ...or neither?
- (Pali texts omit "both" and "neither")

Questions concerning the existence of the world in space

5. Is the world finite?
 6. ...or not?
 7. ...or both?
 8. ...or neither?
- (Pali texts omit "both" and "neither")

Questions referring to personal identity

9. Is the self identical with the body?
10. ...or is it different from the body?

Questions referring to life after death

11. Does the Tathāgata (Buddha) exist after death?

Inspired by this novel analysis of Malunkyaputta’s true intent, we could speculate on an alternative reading of the Buddha’s silence. Perhaps, he realized that the world was not yet ready to listen to true answers due to the lack of logic tools. Also, the views of absolute existence and absolute nonexistence do not correspond to the way things really are. He preferred the “Middle Way”.

While the story in Saṃyutta Nikāya (相应部) in the Pali Tipitaka also told of 10 Inexpressible, a slight discrepancy occurred in the Majjhima Nikaya (中阿含经) in that the questioner was Vacchagotta (婆蹉种) and not Malunkyaputta (鬘童子). The geographic location (Jeta’s Grove in Savathi) was identical in both canons. For sure both these Theravada canons reported 10 questions.

The Saṃyukta Āgama 《杂阿含经》 translated from whole Sanskrit texts to Chinese corresponds well to the Pali Saṃyutta Nikāya (相应部). Mere fragments of the original Sanskrit survived. Peculiarly, the Chinese sutra presented 14 instead of 10 inexpressible. Scroll 16, #408 [http://www.cbeta.org/result/normal/T02/0099_016.htm] described the Buddha overheard a group of bhikkhu discussing the 14 metaphysical questions in the dining hall of Kalanda Bamboo Garden, Rajagaha City and then responded in the same manner as towards Malunkyaputta but without the poison arrow metaphor. Elsewhere [http://www.cbeta.org/result/normal/T02/0099_034.htm] in Scroll 34, #962 the story involves Vacchagotta (婆蹉种) at Kalanda Bamboo Garden asking whether the Buddha subscribes to the 14 questions. The Buddha denied he ever contemplated on these wrong views. He considered the Four Noble Truth as the sole correct view.

Curiously, the emphasis of the 14 Inexpressible is on presenting 3 sets of quadratic categories and minimized the duality category down to a single pair (Question 9 & 10).

The chronology of the various Āgama sutra versions are:

- ~483 BC Pali versions of Saṃyukta Āgama 《巴利文杂阿含经》 and Saṃyutta-nikāya 《巴利文相應部經》 documented 10 Inexpressible.
- ~383 BC Pali Majjhima-nikāya 《巴利文中阿含经》 documented 10 Inexpressible.
- ~83 BC Sanskrit Saṃyukta Āgama 《梵文杂阿含经》 documented 14 Inexpressible.
- ~439 AD Chinese Saṃyukta Āgama 《汉文杂阿含经》 documented 14 Inexpressible.

Clearly, the 10 Inexpressible featuring 3 pairs of dualities and 1 set of quadratics was at the time of the Buddha. In contrast, the 14 Inexpressible highlighting 3 sets of quadratics and 1 pair of dualities emerged ~400 years later.

Historically, the Sanskrit version appeared after the earlier Pali version of Saṃyukta Āgama. Although the originals were mostly lost, a Chinese translation from Sanskrit of the complete Saṃyukta Āgama 《杂阿含经》 belonging to the Sarvāstivāda (說一切有部) tradition was done by Guṇabhadra (求那跋陀羅 394–468 AD) during the Liu Song (刘宋) Dynasty of the South Dynasties (南朝) Yuanjia Period (元嘉年間 435–443AD) ~900 years later than the Pali version.

Based on these chronologic and historic observations, we hypothesize that the **quadratic category logic is the actual highlight; the inexpressible are mere examples** to bring out the problem of immature logic systems.

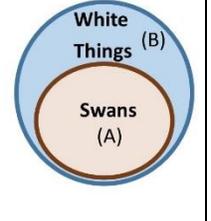
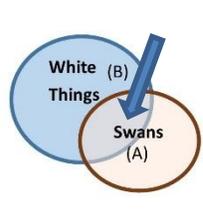
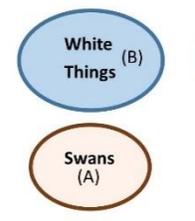
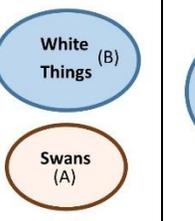
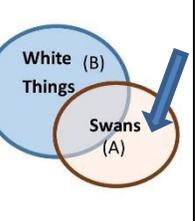
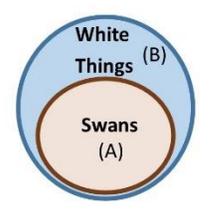
The following rationale further supports our hypothesis: It is generally agreed that the Sanskrit Saṃyukta Āgama was the work of Sarvāstivādins who were precursors of Mahayana. Ideological schism between Sarvāstivāda and Vibhajyavāda is a historical fact. We could reasonably speculate that the Sarvāstivādins put a lot of thought into editing and conferring the true meaning of the Tathāgata rather than mere literal translations from Pali to Sanskrit to Chinese. Omission due to forgetfulness is understandable after generations of oral transmission. But insertion of extra text is astounding. Thus, the addition of new content (14 Q with 3 quadratic sets) to the original text (10 Q with 1 quadratic set) in such a logical manner is very likely to be deliberate. The deletion of the poison arrow passage was probably intentional so as to avoid distraction from the logic highlight.

2 Aristotelian Category Logic

In order to describe reality accurately and thoroughly Aristotle (384~322 BC) invented 10 categories [[https://en.wikipedia.org/wiki/Categories_\(Aristotle\)](https://en.wikipedia.org/wiki/Categories_(Aristotle))] to identify/distinguish all things in the world. This is not to be confused with his category logic below. His ultimate goal is to develop syllogism [<https://en.wikipedia.org/wiki/Syllogism>], defined as logical argument that applies deductive reasoning [https://en.wikipedia.org/wiki/Deductive_reasoning] to derive a conclusion based on two or more propositions that are asserted or assumed to be true. For example, when we say all dogs are mammals, we cannot turn it around and say all mammals are dogs. Why? because mammal is a category that contains a subset of dog. Fig 3 illuminates the grave problem of thinking or arguing in language. Using English syntax as stated within brackets, the colour of swan could be argued in six ways, deceptively creating six categories. The language syntax is correct but the logic is erroneous. Using pictures, the six categories collapsed into three, which is also wrong. This exercise demonstrates our common mental inadequacies to describe reality accurately and thoroughly. Errors are plentiful when we use only either our left-brain language or our right-brain picture to think. Venn diagrams uses both words and pictures together forcing the left- and right-brain to work together to arrive at a correct mindset. Venn diagrams accurately describes all the possibilities of the colour of swans pertaining to the colour white into four quarters.

The arrow in the second column points to the overlapping area (white swans) which is different from the arrow in the fifth column pointing at the area outside white things (non-white swans).

Fig 3. Aristotelian Category Logic (with examples in brackets) depicted by Venn diagrams

All A (Swan) are B (All swans are white)	Some A are B (Some swans are white)	No A are B (No swans are white)	All A are not-B (All swans are not white)	Some A are not-B (Some swans are not white)	No A are not-B (No swans are not white)
					
					

Comparing Fig 3 Aristotelian categories to Fig 2 Buddhist quadratic categories, obviously the two logic systems are entirely different. Aristotle tames the mind to tidy up ideas whereas Buddhists challenge the mind to explore unconventional ideas and instigate new viewpoints.

3 Nāgārjuna Mulamadhyamakakarika and Great Treatise on the Perfection of Wisdom

Nāgārjuna (龙树 150~250 AD) [<https://en.wikipedia.org/wiki/Nāgārjuna>] is one of the most influential Buddhist philosophers after Shakyamuni. Born a Brahman, he converted to Sarvāstivāda Buddhism. Chinese Buddhism honoured Nāgārjuna as the founding father of eight traditions.

3.1 Definition of “Middle Way” by Shakyamuni

In the English translation of the Chinese Saṃyukta Āgama Sutra 《杂阿含经》 pertaining to the “Middle Way” (Choong 2010), Shakyamuni define the “Middle Way” in four passages to consistently mean avoiding extreme/opposite views. The passage numbers and titles are: 3) the excellent Dharma (Right view, the “Middle Way”) 胜妙法 (正见中道); 4) Empty of the eternalist and annihilationist view (The “Middle Way”) 空常见断见 (中道); 5) The great discourse on the emptiness of dharmas 大空法经; and 6) Establishing right view 施設正见. Based on the Buddha’s explicit words in these four passages, the scripts did not represent non-duality, which is to embrace two opposite sides. Avoidance is very different from embracing.

Following this doctrine Nāgārjuna founded the Madhyamaka school of Mahayana Buddhism. His written contribution to the advancement of Buddhist quadratic category logic is expounded below.

3.2 Fundamental Verses on the “Middle Way”, Mūlamadhyamakārikā《中论》

This treatise [<https://jampasmandala.wordpress.com/2011/07/06/mulamadhyamakakarika-by-Nāgārjuna/>] is the foundation of the Madhyamaka School, which focuses on the analysis of emptiness, and was thus also known as Śūnyatavāda. Nāgārjuna defined the “Middle Way” as:

“... Conditioned origination is emptiness. It is mere designation depending on something, and it is the middle path (24.18). Since nothing has arisen without depending on something, there is nothing that is not empty (24.19) (Bronkhorst, 2009).”

“Whatever is dependently co-arisen; that is explained to be emptiness. That, being a dependent designation, is itself the “Middle Way” 眾因緣生法，我說即是無。亦為是假名，亦是中道義。”

[http://promienie.net/images/dharma/books/Nāgārjuna_mulamadhyamakakarika.pdf page 69, Verse 18]

His definition of “Middle Way” adhered to Shakyamuni’s dependent origination doctrine.

The opening dedicatory verses in the Mūlamadhyamakārikā are the famous 8-nots: [http://promienie.net/images/dharma/books/Nāgārjuna_mulamadhyamakakarika.pdf page 2]

I prostrate to the Perfect Buddha, the best of teachers, who taught that Whatever is dependently arisen is

Unceasing, unborn, 不生亦不灭 = 不生亦不生

Unannihilated, not permanent, 不常亦不断 = 不常亦不常

Not coming, not going, 不来亦不出 = 不来亦不来

Without distinction, without identity, 不一亦不异 = 不一亦不一

And free from conceptual construction.

Let us convert the 8-Not without changing their meanings:

Unborn and unceasing = not born and not not-born 非生亦非非生

Not permanent and unannihilated = not permanent and not not-permanent 非常亦非非常

Not coming and not going = not coming and not not-coming 非来亦非非来

Not dual and not mono = not unison and not not-unison 非一亦非非一

Employing Venn diagram for correct interpretations, Fig 4 readily displays that Nāgārjuna used the 4th quadrant (designated as the “Neither” area as per Fig 2) of the Buddhist quadratic categories to express his Śūnyata doctrine of conditioned origination, a new viewpoint of avoiding extremes.

Fig 4. Śūnyata doctrine of Nāgārjuna depicted by Buddhist quadratic category logic

Unborn and unceasing	Not permanent and Unannihilated	Not coming and not going	Without identity and without distinction
不生亦不灭	不常亦不断	不来亦不出	不一亦不异
<p>Unborn & Unceasing</p>	<p>Not permanent & Unannihilated</p>	<p>Not Coming & Not Going</p>	<p>Without identity & without distinction</p>

It is critical that we must not convert the double negatives to a single positive; the meaning will change. For example, Not permanent and Unannihilated cannot be converted to Annihilate and Permanent. Recognizing this conversion rule let us see why the double negative term is a crucial necessity, the only correct way to refer to the 4th quadrant, the area labelled as “Neither” in Fig 2.

Unmistakably, each verse is composed of a duality pair. The first pair refers to genesis, the second to sustainability, the third to migration and the fourth to monism; all concerning existentialism. Nāgārjuna no longer shy away from existential questions. He tackled metaphysics head-on using Buddhist quadratic logic to position his Śūnyata theory into the 4th quadrant of double negatives, thereby expressed the Inexpressible. The genius of Nāgārjuna is his recognition of the Buddhist quadratic category logic and used this power tool in his opening verses and throughout his work.

3.3 Great Treatise on the Perfection of Wisdom《大智度論》

This treatise [<https://en.wikipedia.org/wiki/Mahāprajñāpāramitāupadeśa>] was work done by Nāgārjuna in his late period (Shih, Yin-shun 1991). In this literature Nāgārjuna blatantly used quadratic category logic to redefined “Middle Way” as follows:

Non-existent and not non-existent. Also, again not existent or non-existent. Even this saying too is unacceptable, so this is the name and meaning of the “Middle Way”. 非有亦非無, 亦復非有無。此語亦不受, 如是名中道。

[Mahāprajñāpāramitāupadeśa First Article, Explanations of the Ten Metaphors Number 11, Scroll 6, 《大智度論》大智度初品中十喻釋論第十一, 第6卷; <http://ftp.budaedu.org/ghosa/C006/T0633/ref/T0633.pdf>, page 48, 0105a11]

He finally realized that the “Middle Way” should not be defined as another name to refer to conditioned genesis in general, or the 12-dependent origination in particular. By using quadratic category logic, Nāgārjuna managed to circumvent Sakyamuni’s definition of “Middle Way” as another name for conditioned genesis. His new definition captured what he meant by Śūnyata.

He then turned around and masterminded that the great wisdom of liberation is derived from a thorough understanding, application and utilization of the quadratic category logic system. In the “First Article, Explanations on the Meaning of Great Loving Kindness and Compassion, Scroll 42, Number 27 大智度論釋初品大慈大悲義第四十二卷二十七 [<http://ftp.budaedu.org/ghosa/C006/T0633/ref/T0633.pdf> page 198, 0259b29]

So it is for every and all dharma; the so-called the dharma of existence and the dharma of non-existence, of both existence and non-existence, of both not existence and not non-existence; The dharma of emptiness and the dharma of non-emptiness, both empty and non-empty, neither empty nor not-empty; the dharma of birth, the dharma of decease, of both birth and decease; of both unborn and un-decease; the dharma of both non-arising and non-ceasing, the dharma of both not non-arising and not non-ceasing; the dharma of both non-arising and non-ceasing, and not non-arising and not non-ceasing; the dharma including not non-arising and not non-ceasing, not non-non-arising, and not non-non-ceasing; So it is for every and all dharma. The so-called the dharma of existence, the dharma of non-existence, the dharma of both existence and non-existence, the dharma of both not existence and not non-existence are four equanimity statements that any one statement should not be hold onto. The dharma of emptiness, non-emptiness, arising, ceasing, both non-arising and non-ceasing are also five statements to be similarly regarded (with equanimity, without attachment). By this unimpeded wisdom, one knows thoroughly and encompasses all the dharma taken in through a multitude of countless incalculable (Asamkhya) dharma gates. The name of this wisdom is called “all pervasive wisdom”, “all kinds of pervasive wisdom”.

In today's language, Nāgārjuna could simply be paraphrased as “Do not hold on to any one of the four possible views as per Fig 2. Take on all four (five) kinds of views, understand each and all viewpoints. Only then will you attain the great liberating wisdom of know-it-all, no matter what the subject matter is.” Unfortunately, Nāgārjuna did not have the convenience of Venn diagrams to simplify his presentations. Consequently, he was stuck with spelling out each category relentlessly at length making his composition almost incomprehensible. At this point the author is only a step away from saying that Nāgārjuna considered the quadratic category logic system is the great wisdom that liberates. Throughout this Treatise (which I prefer to translate as “Treatise on Great Wisdom Liberates”) Nāgārjuna was fluent in writing in the quadratic format. The above is but a small sample of Nāgārjuna's immense contribution to Buddhist quadratic category logic.

4 Non-duality taught by the Avatamsaka Sutra Module

The logic that validates the concept of non-duality as per Fig 2 was elucidated for the first time in the Avatamsaka Sutra. Due to space limitations the readers are referred to the article “How to Transcend Duality?” from our Academy previously published at the 2014 UNDV conference (Cheng 2014). Great significant is that the Avatamsaka Module teaches embracing opposite viewpoints in contrast to Shakyamuni's definition of “Middle Way” to avoid opposing viewpoints. The teaching is found in the Avatamsaka Sutra [大方廣佛華嚴經], “Enter the dharma realm [入法界品]” Section 12 [善財童子第十二參]. The Juvenile Master of Self-reliance [自在主童子] taught the Juvenile Master of Value [Sudhana 善財童子] to count increasingly large numbers. He started from one koti unit (10 million = 10,000,000 = 8 digits) to unspeakable² unit [不可說轉] (18609191940988822220653298843924824065 digits) over 123 operations of squaring. At every squaring step, each infinitesimal number was quantified by the provision of a unit of measurement for that product. This exercise accomplishes the following learning objectives:

1. Close mindedness can be quantified by discovering one's thinking box at the point when the huge number is regarded as infinity.
2. Recognize that infinity is a concept created by the close mind or limited thinking box.
3. The quality/quantity duality is transcended as the abstract term “unspeakable” becomes a concrete “speakable” unit.
4. Finite/infinite can co-exist and not mutually exclusive; yet we can remain comfortable with the traditional definition of finite versus infinite.

The non-duality logic can be visualized as the overlapping area labelled as “Both” in Fig 2. This logical category is so important that for the first time a teaching is repeated in the same sutra, Scroll #45, Asamkhyā Article, Chapter 30 (卷四十五, 阿僧祇品, 第三十章) where the Tathāgata instructed the Bodhisattva Ruler of Heart (心王菩薩). In fact, the early foundation of this teaching can be located in the Lankavatara Sutra Scroll #1, Chapter 1, Section 1, “Speaking about the Heart by All Buddha” (楞伽阿跋多羅寶經卷第一, 一切佛語心品第一之一) in the conversation between the Bodhisattva Great Awareness (Mahamati 大慧) and the Tathāgata.

5 School of the Three Treatises

5.1 Developmental history

Kumarajīva (鳩摩羅什) transmitted the Madhyamaka School into China during the Northern and Southern Dynasties (南北朝 420-589 AD). As a result, two major lineages emerged; the Tiantai sect (天台宗) and the School of the Three Treatises (三論宗) [https://en.wikipedia.org/wiki/East_Asian_Mādhyamaka]. The Three Treatises are Nāgārjuna's

Fundamental Verses on the Middle Way (Mūlamadhyamakakārikā 《中论》); The Treatise on the Twelve Gates 《十二门论》; and Śataśāstra or The Hundred Verse Treatise 《百论》 [<https://en.wikipedia.org/wiki/Śataśāstra>] a work by Nāgārjuna's disciple Āryadeva (提婆 3rd Century AD). Traditionally, Buddhist schools are established on sutras. The establishment of a school based entirely on three treatises is unprecedented and signifies a major paradigm shift in ideology. Kumarajiva translated and promoted the three treatises during the Later Qin Dynasty (後秦 384-417 AD) thereby setting the ideological foundation of the school. The doctrines progressively matured after a few generations. By the Sui Dynasty (隋朝) Ven. Jizang (吉藏 546-623 AD) [<https://en.wikipedia.org/wiki/Jizang>] amalgamated the principles in the three treatises into his own writings thereby completed the ideological system of the school.

5.2 Central ideology

Jizang took the 8-nots from the “Middle Way” of Nāgārjuna further to construct his own treatise of quadratic category of twofold truth (四重二谛论) which became the central doctrine of the School. Buddhism subscribe to two kinds of truth 二谛; conventional truth 俗谛 and ultimate truth 真谛 [https://en.wikipedia.org/wiki/Two_truths_doctrine]. Sengquan 僧詮 and Falang 法朗 [<http://chinabuddhismencyclopedia.com/en/index.php?title=Fa-lang>] advocated ultimate truth to dismantle the view of existence but espoused conventional truth to dispel the view of non-existence. They regarded the twofold truth as skilful means to establish the “Middle Way” doctrine. Later on, Jizang expanded this concept in Treatise on the Mystery of the Mahayana 《大乘玄论》 [http://buddhism.lib.ntu.edu.tw/BDLM/sutra/chi_pdf/sutra19/T45n1853.pdf] and Commentary on the Madhyamika śāstra 《中观论疏》 [http://buddhism.lib.ntu.edu.tw/BDLM/sutra/chi_pdf/sutra18/T42n1824.pdf]. He constructed a 4-level cascade for the twofold truth (TABLE 1) which became the central ideology of the School. We can see from TABLE 2 that the operation to create a level is by combining the two truths from the preceding level into Conventional truth. Then fill in the content under ultimate truth.

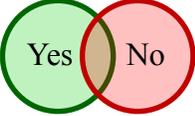
TABLE 1. Jizang's 4-levels of twofold truth 吉藏的四重二谛论

Level	Conventional truth 俗谛	Ultimate truth 真谛
1 第一重	Existence 有	Śūnyata/emptiness 空
2 第二重	Existence and emptiness 有、空	Non-existence and non-emptiness 非有非空
3 第三重	Existence and emptiness are duality; Non-existence and non-emptiness are non-duality 空、有是二，非空非有是不二	Not Existence and not emptiness; Not non-existence and not non-emptiness; Not duality and not non-duality 非二非不二
4 第四重	All of the above are merely skilful means for teaching 前三重的二谛都是教门	Ultimate reality is unthinkable, unspeakable 言忘虑绝才是真谛

5.3 Formal analysis of Jizang’s 4-levels of twofold truth

Subjecting TABLE 1 to quadratic category logic analysis, we can immediately pin point what went wrong (TABLE 2). Level-1 and -2 are correct because the 4 quadrants abide by the definitions in Fig 2. The content in each of the 4 quadrants are knowable epistemologically speaking and will be exemplified in Section 9. Levels-3 and -4 committed the informal logical fallacy called “red herring”. When a pack of hunting dogs are chasing a fox by following its smell, a red herring, which has a very pungent fishy smell, is dragged across the fox’s path in a different direction. The dogs are misled to pursue a different subject that has nothing to do with the original pursuit. Likewise, Level-3 and -4 has nothing to do with the issue of existentialism in Level-1 and -2. Remember a fallacy is an invalid argument which appears logical and convincing because it assumes the form of formal logic.

TABLE 2. Derived by subjecting TABLE 1 to analysis by category logic as per Fig 2

Level	Conventional truth 俗谛	Ultimate truth 真谛
1→ Existence		
2→ Existence		Outside the 2 circles
3→ Duality	Level-1 is duality, Level-2 is non-duality	Not duality and Not non-duality
4→ Epistemology	The 3 levels above are merely skilful means for teaching purposes	Unknowable, unthinkable, unspeakable

To play the devil’s advocate, suppose I expand Jizang’s system one step further and claim that truth known to Shakyamuni (or Jesus Christ or Krishna for that matter) is unknown to the rest of humanity. Then I could add Level-5→Relativism to the bottom of Jizang’s two-fold system (TABLE 3). I am totally justified to do so based on the words of 2 sages, namely Shakyamuni and the 6th Patriarch Hui Neng 六祖惠能 (638-713 AD) of the Chinese Zen tradition. In the Simsapā Sutta [https://www.dhammadtalks.org/suttas/SN/SN56_31.html] the Tathāgata disclosed that what he knows is akin to all the leaves in the forest but what he taught amounts to the handful he is grasping. In the last will to his disciples recorded in the Platform Sutra Article 10 (Hua 2011) the 6th Patriarch emphasize that advocating unspeakable is a blasphemy.

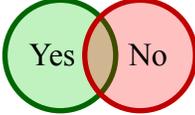
TABLE 3. Extension of artificial levels to the twofold truth system of Jizang

Level	Conventional truth 俗谛	Ultimate truth 真谛
Level-5→ Relativism	Ultimate truth is unthinkable, unspeakable to us	Thinkable, speakable by enlightened sages
Level-6→ Anthropocentrism	All beings on earths don’t know	Extraterrestrial advanced civilizations know
Level-7→ Cosmocentrism	Every photon potentially carries information but itself & even extraterrestrials don’t know that	Entanglement with an observer decohere the photon’s information which becomes known to us

Level-8→ Monism	Everything said above are constructed by human consciousness	The entire universe is conscious
Level-9→ Simulation hypothesis	Our universe is a virtual reality projected by programming	The projector / programmer outside our universe God only knows

Now I can perform the same operation and add Level-6 to TABLE 3. Why stop there! Taking all the beings in the entire cosmos, I can argue for Level-7...Level-8... and go outside our universe to insert Level-9. See how simple it is to take the bottom-right cell of ultimate truth, convert it into conventional truth and add a level of two-fold truth? There is no end to adding levels upon levels; something is very wrong with this seemingly logical argument! The reader can easily see I am making a mistake but may not be so astute when it comes from an authoritative sage! To rectify Jizang’s error, the correct placement of his Level-3 should be in its own quadratic category by its own right (TABLE 4).

TABLE 4. Quadratic category for Duality

Level-3	Yes	No
Duality		
Non-duality		Outside the 2 circles

The logical pitfall of Jizang’s Level-4 is most severe. It concerns epistemology, not skilful means of teaching. Worse, it subscribes to the misnomer that ultimate truth is unknowable, which is a mistake that the Tathāgata aimed to correct twice in the Avatamsaka Modules.

In brief, Jizang had a glimpse of the quadratic category logic system and did utilize it correctly to establish Level-1 and -2. However, he committed the “red herring” fallacy and piled upon layers of unrelated issues until he realized that this kind of piling can occur to no end. Thus, he put an artificial end to it at Level-4 and unfortunately come to the dead-end erroneous conclusion that ultimate truth is unthinkable. Nonetheless, Jizang deserves to be credited for finding out that in tackling the truth, one has no choice but to unsuspectingly utilize quadratic category logic. The detriment of inadequate training in handling this power tool is illustrated.

6 Avatamsaka categorization of Buddhist teachings

Doctrinal classification schemes [\[https://en.wikipedia.org/wiki/Classification_of_Buddha's_teaching\]](https://en.wikipedia.org/wiki/Classification_of_Buddha's_teaching) proposed by several Mahayana schools was a highly significant development because it arose from divergence and disputes among Buddhist schools themselves. Buddhism is the only religion in the world that allows itself to evolve with time and circumstances, which necessitates the accommodation of new philosophy and diverge ideologies. Any religion or school which claims orthodoxy and monopoly on ultimate truth for all times would be religious fundamentalism, a major devastation to peace and progress of civilization. The Avatamsaka School (Huayan 華嚴) [\[https://en.wikipedia.org/wiki/Huayan#Classification_of_Buddhist_teachings\]](https://en.wikipedia.org/wiki/Huayan#Classification_of_Buddhist_teachings) developed a 5-fold classification [\[https://en.wikipedia.org/wiki/Huayan#CITEREFBuswell1993\]](https://en.wikipedia.org/wiki/Huayan#CITEREFBuswell1993) listed in TABLE 5.

TABLE 5. Avatamsaka categorization of Buddhist teachings

Existence	Category	Doctrine
1—Yes 有 (缘起)	Śrāvakas	Small vehicle, Hinayana of Sarvāstivāda, Hearer of dharma, the self and phenomena are impermanent, pursue nirvana, become an arahat
2—No, non-existence 空	Elementary Mahayana	Yogacara , Madhyamaka Emptiness, Sunyata,
3—Both Yes & No 亦有亦空	Final Mahayana	Non-duality between the above two, Tathāgatagarbha-teachings , the Awakening of Faith
4— Both Not yes & Not No 非有亦非空	Sudden abrupt Mahayana	Immediate awakening followed by gradual cultivation. Practices and teachings cannot create what is already there, our Buddha nature. Buddhahood is seen as revelation rather than verbalization.
5—All of the above together	One-vehicle Buddhahood	The complete, or perfect, teachings of the Avatamsaka-sutra and the Huayan School, Samantabhadrayana

In Mahayana Buddhism, śrāvakas (Hinayana) [<https://en.wikipedia.org/wiki/Śrāvaka>] are sometimes contrasted negatively with bodhisattvas; its teaching was categorized as beginners or Level-1. Subjecting TABLE 5 to the scrutiny of Venn diagram (Fig 5) two logical flaws are revealed. Firstly, the Sudden/Abrupt Enlightenment in Category-4 leans toward the “unthinkable, unspeakable” misnomer. Secondly, the so-called Level-5, which is supposed to be a teaching level all-encompassing the 4 levels prior, is a figment of imagination because it is actually referring to the entire Venn diagram itself. There is no other way to view an elephant over and above the 4 viewpoints. Similarly, there is no “one-vehicle” teaching method outside of learning all the 4 categories. Nonetheless, the Avatamsaka School deserved to be credited for employing quadratic category logic unintentionally and subconsciously, like any thoughtful Buddhists in history would find themselves doing. According to Fig 5, the School did manage to place the 4 categories correctly, which is a marvellous achievement and promotion of Buddhist logic.

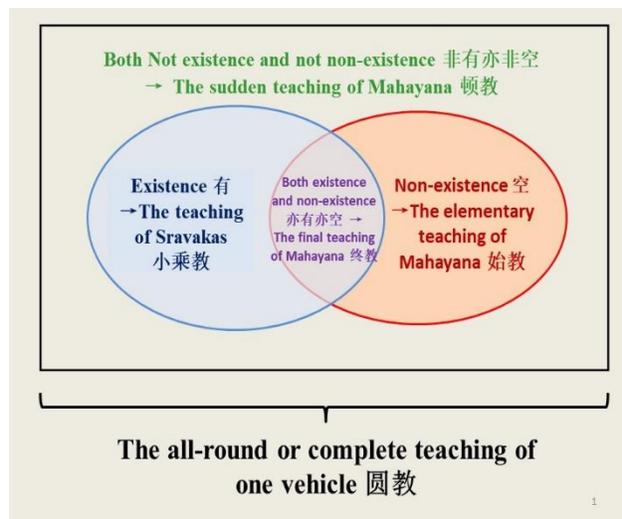


Fig 5. Venn Diagram for Avatamsaka Categorization of Buddhism 华严五教 维恩图

7 Zen School’s rhetorical one-shout permeates Avatamsaka’s five categories (一喝透五教)

During the Huizong Period of the Song Dynasty in China, the royal military commander Chen hosted an open symposium that anyone regardless of personal status was free to attend and debate Buddhist dharma at liberty. Numerous famous masters attended. Accompanied by his prime minister, Emperor Huizong was present incognito [http://tripitaka.cbeta.org/X80n1565_012]. An expert Avatamsaka elder charged “The Buddha taught us curricula from Sravakas through one-

vehicle before we can attain Buddhahood. I often heard the Chán tradition claims that a single shout can bring forth enlightenment. That is contrary to the sutras unless you can show us.” Head of the Chán clan called out his junior monk Jing Yin who happily obliged “This simple problem does not deserve a response from our elders...”. He proceeded to first define the 5 Avatamsaka classes (TABLE 6, first column), then shouted loudly and gave his explanation (second column). The Avatamsaka expert succumbed. Chán Master Jing Yin won due to impeccable rhetoric depicted in Fig 6, which is superimposable over Fig 5.

TABLE 6. Zen Master Jing Yin’s one shout permeated all 5 Avatamsaka classes of teachings

Classes	Permeation of Avatamsaka Classes
Sravakas 小乘 Existence Yes 是	My shout exists when you hear it. This is an example of the teaching of Sravakas for the dharma hearer.
Elementary teaching of Mahayana 大乘始教 Existence No 非	Later, the sound subsided. Since you can’t hear the sound which existed a moment ago, that sound is empty, it is “non-existence”.
Final teaching of Mahayana 大乘終教 Existence both yes and no 亦是亦非	When I shouted, existence emerge from non-existence. When the sound subsided, non-existence comes from existence. So, both existence and non-existence are relatives and complementary.
The sudden teaching of Mahayana 大乘頓教 Existence both not yes and not no 非是亦非非	When I shouted, you said “yes there is sound”. Later you said “no” which emerged from yes. So, your no is based on both not existence and not non-existence.
The all-round complete teaching of one vehicle 一乘圓教 All of the above. 包含以上四个范畴:有, 空, 亦有亦空, 非有亦非空	My one shout is beyond existence and non-existence, analysis and synthesis. When I say “existence”, there is nothing. When I say “non-existence”, there is everything. That is to say, this shout penetrates hundreds of trillions of shouts, and vice versa.

The friendly fire between the two schools ignited a glorious firework display of advance Buddhist ideologies. Resolving existentialism became the central doctrine; the poison arrow metaphor is a fundamentalism dogma no more. Momentously, both schools employed quadratic category logic as foundation for their doctrines. Both dispelled the misnomer of unthinkable and unspeakable truth. The Chán Master display a thorough knowledge of Buddhism not limited to his own tradition; Chán is not meditation in the void. In the end Buddhism must be preached through valid logical argument, not mysticism.

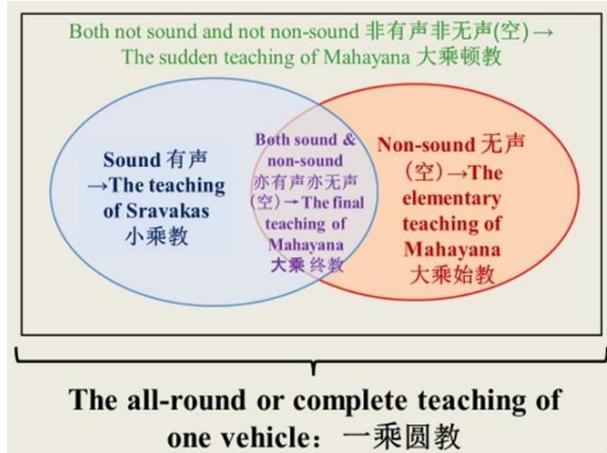
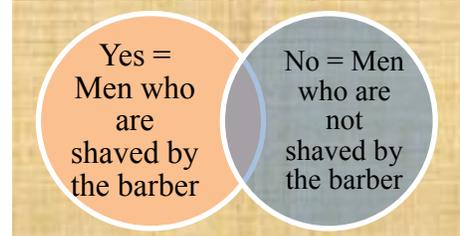


Fig 6. Chán One Shout (Sound) 一喝透五教

8 Bertrand Russell’s barber paradox

Conditioned by Aristotelian’s restrictive category logic, philosophers have notice inconsistencies and have no choice but to label them as paradox. Such label by our mindset is because there are no known logical systems to accommodate the inconsistency. Amazingly, paradox can be comfortably placed in the “Both yes and no” category in the Buddhist quadratic logic system.

The famous Bertrand Russell ‘Barber Paradox’ is funny. You can define the village barber as “one who shaves all those, and those only, who do not shave themselves”. The question is, does the barber shave himself? Answering this question results in a contradiction. The barber cannot shave himself as he only shaves those who do not shave themselves. If he shaves himself, he ceases to be the barber.



If the barber does not shave himself then he fits into the group of people who would be shaved by the barber. This is an excellent example of the breakdown of internal consistency of logic when we think only in terms of duality. This paradox is quickly resolved by a Venn diagram using Buddhist quadratic category logic. The barber (a non-duality entity because he fits into both opposites) should be placed in the overlap of the Yes and No categories. Women and children are outside the two circles. The entire population of the village is confined within the rectangle. See how conflicts between 2 camps can be transcended by considering 2 more other possibilities.

9 Elucidation of logic systems

Infinity is arguably the largest concept conceivable by the human mind. If the mutually exclusive state of being finite and infinite can be simultaneously accepted, opposite dissolves and non-duality achieved, then conflicts smaller than infinity should be solvable. Let us take the quadratic questions 5, 6, 7 & 8 from the 14 Inexpressible and express the answers completely. We can accomplish this task neatly by employing Buddhist quadratic category logic (TABLE 7).

TABLE 7. Buddhist quadratic category logic inspires answers to perplexing questions

Question	Category	Knowledge Context
1—The universe is finite	Yes	The universe is 13.77 billion years old since the Big Bang. Since space-time is a single thing, finite age means finite space; thus, the universe is finite by definition.
2—The universe is finite	No	Expansion of the universe is accelerating, getting bigger every split second with no end in sight; that fits the definition of infinite.
3—The universe is both finite and infinite	Both Yes & No	Since the above two categories are both true, logical consistency demands both the Yes and No answers are correct. Non-duality embraces, not avoid, both extremes.
4—The universe is both not finite and not infinite	Both Not yes & Not No	The content in here must be distinct from the above 3 categories. Not infinite because cosmological knowledge is finite due to the speed limit of light. The radius of the observable universe is 46 billion light years ($\sim 10^{27}$ m). The radius reachable to us is 14.5 billion light years. Not finite because when we look outwards into every direction we are looking back in time. When we look back far enough, we think we should see the edge of our universe but we see the baby picture of the Big Bang (the 3°K Cosmic Microwave Background Radiation)

		pervading everywhere, even on our radio and TV screen in between channels. The human concept of both finite and infinite breaks down.
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In the Prajna Paramita Heart Sutra "...form is not different from emptiness, emptiness is not different from form, form is emptiness and emptiness is form" fits seamlessly into Category-3 embracing opposites; a perfect example of non-duality logic. But that is not enough. We must pursue how conflicts can be totally resolved by exploring the possible solutions in Category-4.

Try answering other difficult questions. Is an electron (or a photon) a real thing, a particle? Perhaps then we could appreciate the power of Buddhist quadratic category logic,

All truths are describable if you know them. Beware that unthinkable and unspeakable are derived from ignorance of contents in Category-4. Therefore, epistemology should never be in Category-4 which already contains all possibilities of knowledge limits. Otherwise, epistemology can be inserted into Category-4 of any issue, a mistake Jizang made.

In conclusion, classical Aristotelian category logic is divisive and restrictive but Buddhist category logic is inclusive and inspiring. Buried deep in our history for over 2,500 years, this ancient Buddhist wisdom should be offered as contemporary category logic. Quantum physicists and cosmologists are still wrestling with fuzzy logic because they lack an alternative logic system. Anyone in pursuit of the truth, especially peace-makers, world leaders and problem-solvers must learn to overcome the Aristotelian divisiveness. This article has house-cleaned Buddhist ideologies throughout our history and unearthed this treasure of wisdom. Thus, promoting the education of Buddhist quadratic category logic is the first priority for directing civilization onwards. This logic has nothing to do with the ethics of tolerance or inclusiveness even though they maybe by-products. It is a complete, self-consistent logic system, a power tool that enforces an accurate and thorough description of reality. Venn diagrams are indispensable for accurately understanding the logic.

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