## 阿僧祇究竟是多大?

How Large is One Asamkhyeya?

比丘 近永 文/譯 WRITTEN AND TRANSLATED BY BHIKSHU JIN YONG

了了僧祇是佛教經典中經常出現的梵文名詞,譬如:釋迦牟尼佛是經過三大阿僧祇劫的修行才成佛的。阿僧祇意譯不可算計,然而,它是否真的大到無法計算嗎?丁福保、佛光及Soothill/Hodous<sup>[1]</sup>等佛學字典皆說一阿僧祇等於一千萬萬萬萬萬萬兆(10<sup>47</sup>),而Buddhism A to Z<sup>[2]</sup> 則說一阿僧祇等於10的59次方(10<sup>59</sup>)。Thomas Cleary將八十華嚴由中文翻譯爲英文的Flower Ornament Scripture<sup>[3]</sup>,他計算出一阿僧祇等於10的2.03x 10<sup>32</sup>次方(10<sup>202</sup>, <sup>986,585,220,637,305,510,651,276,820,480</sup>)。究竟誰是誰非呢?

世親菩薩著、玄奘大師中譯的『阿毘達磨俱舍論』「41第三分別世品論及六十數:『有一無餘數始爲一,一十爲十,十十爲百,十百爲千,十千爲萬,十萬爲洛叉,十洛叉爲度洛叉,十度洛叉爲俱胝…十大跋邏攙爲阿僧企耶。於此數中忘失餘八。』此六十數爲十進位,十萬爲洛叉,阿僧祇是所列的五十二數中的最大數,故一阿僧祇爲1051。根據此論,忘失的八數都比阿僧祇大,翻譯名義大集[7]更列出此八數的名稱(見佛光佛學辭典【五十二數】條)。如忘失的八數都比阿僧祇小[5],[8],則一阿僧祇爲1059。換言之,一阿僧祇介於1051及1059之間,視忘失八數的大小而定。

然而,般若法師 (西元768年) 翻譯的四十華嚴<sup>[9]</sup>第十卷列有144個數字,阿僧祇是第125大數。經文節錄如下:『所謂:百千爲一洛叉;一百洛叉爲一俱胝;俱胝俱胝爲一阿庾多;阿庾多阿庾多爲一那由他……』由此可計算出一洛叉等於10<sup>5</sup>,一俱

Asamkhyeya is a Sanskrit word that appears often in the Buddhist texts. For example, Shakyamuni Buddha is said to have practiced for three great asamkhyeya kalpas before becoming a Buddha. Asamkhyeya means 'incalculable'; however, is it really too large to calculate? Ding Fubao (丁福保), Foguang (佛光), and Soothill/Hodous' [1] Buddhist Dictionaries all state that one asamkhyeya is equal to 10 to the power of 47 (10<sup>47</sup>), while Buddhism A to Z [2], among others, states 10 to the power of 59 (10<sup>59</sup>). The Flower Ornament Scripture [3] (Avatamsaka Sutra) translated from Chinese into English by Thomas Cleary states an incalculable (asamkhyeya) is equal to 10 to the power of 2.03 x 10<sup>32</sup> (10<sup>202,986,585,220,637,305,510</sup>. 651,276,820,480). Which one is correct then?

Vasubandhu's *Abhidharmakosha* [4], [5]\* talks about 60 numbers from 1 up, with 10-fold consecutive increases; however, eight numbers are missing from the list. The Chinese version translated by the Venerable Xuan Zang makes it very clear that *asamkhyeya* is the largest one in the list of 52 numbers [6], one *asamkhyeya* is thus equal to 10<sup>51</sup>. Mahavyutpatti [v] further lists these eight missing numbers (also see 五十二數in Foguang Dictionary). However, one *asamkhyeya* may be equal to 10<sup>59</sup>, if all eight missing numbers are smaller than it [5], [8]. Or one *asamkhyeya* may be somewhere between 10<sup>51</sup> and 10<sup>59</sup>, depending on where the eight missing numbers are located.

On the other hand, Roll 10 of the *Gandavyuha* [9] translated from Sanskrit into Chinese by Prajna (768 C.E.) lists 144 numbers and *asamkhyeya* is the 125<sup>th</sup> one. It states: "100,000 makes one *laksha*, 100 *lakshas* makes one *koti*. A *koti* of *kotis* makes one *ayuta*. An *ayuta* of *ayutas* makes one *nayuta*…" Hence 1 *laksha* equals to 10<sup>5</sup>, 1 *koti* equals to 10<sup>7</sup>, 1 *ayuta* equals to 10<sup>14</sup>, 1 *nayuta* equals to 10<sup>28</sup>…, and 1

胝爲10<sup>7</sup>, 一阿庾多爲 10<sup>14</sup>, 一那由他爲10<sup>28</sup>....., 一阿僧祇等於10的7.44 x 10<sup>37</sup>次方 (10<sup>74,436,800,000,000,000</sup>, 也大於俱舍論的數值。

佛馱跋陀羅法師(西元359-429年)翻譯的六十華嚴[11]係華嚴經最早的中譯本。其第二十五心王菩薩問阿僧祇品則列有122個數字,與八十華嚴十分相近,僅缺少第101及最大的124項。阿僧祇是第104大數。經文節錄如下:『百千百千名一拘梨,拘梨拘梨名一不變,不變不變名一那由他……』因此,一拘梨 (俱胝)等於10<sup>10</sup>,一那由他等於10<sup>40</sup>,一阿僧祇則等於10的5.07x10<sup>31</sup>次方(10<sup>50,706,024,009,129,20</sup>0.000,000,000,000),略小於八十華嚴的數值。

表一爲上述討論的摘要,外加二個常見的大 數。

綜上所論,一阿僧祇可能的最小值是10<sup>51</sup>,最大則爲10<sup>74,436,800,000,000,000,000,000,000,000,000</sup>,視依據的經典而定。四十華嚴中的數列最爲詳盡,上述的上限值即是據此經計算而得。

*asamkhyeya* equals to 10 to the power of  $7.44 \times 10^{37} (10^{74,436,800,000,000,000,000,000,000,000,000})$ #, far greater than Kosha's numbers.

Chapter 30 (Roll 45) of the *Avatamsaka Sutra*<sup>[10]</sup> with 80 rolls translated from Sanskrit into Chinese by Shikshananda (652-710 C.E.) lists 124 numbers<sup>+</sup> and *asamkhyeya* is the 105<sup>th</sup> one. It starts the same as *Gandhavyuha*: "100 *lakshas* makes one *koti*. A *koti* of *kotis* makes one *ayuta*. An *ayuta* of *ayutas* makes one *nayuta*..." except it does not specify how large a *laksha* is. If we also take 1 *laksha* as 100,000 (Foguang Buddhist Dictionary, Kosha<sup>[5]\*</sup>, <sup>[6]</sup>), then 1 *koti* equals to 10<sup>7</sup>, 1 *ayuta* equals to 10<sup>14</sup>..., and 1 *asamkhyeya* equals to 10 to the power of 7.10 x 10<sup>31</sup> (10<sup>70,988,433,612,780,800,000,000,000,000,000)</sup>. Cleary translated this Sutra into English; however, he took 1 *laksha* as 10<sup>10</sup>, and 1 *laksha* of *lakshas* as 1 *koti* or 10<sup>20</sup>. Hence, Cleary came up with 10 to the power of 2.03 x10<sup>32</sup> (10<sup>202,986,585,220,637,305</sup>,510,651,276,820,480) for an *incalculable* (*asamkhyeya*), greater than the present calculation.

Chapter 25 (Roll 29) of the *Avatamsaka Sutra*<sup>[11]</sup> with 60 rolls, the earliest Chinese translation, translated by Buddhabhadra (359-429 C.E.) lists 122 numbers and *asamkhyeya* is the 104<sup>th</sup> one. The list is very similar to that translated by Shikshananda except it is short of the 101<sup>st</sup> and the greatest (124<sup>th</sup>) terms. It also takes **1** *laksha* **as 10**<sup>5</sup>; however, **1** *laksha* **of** *lakshas* **is 1** *koti* or 10<sup>10</sup>. Hence 1 *asamkhyeya* equals to 10 to the power of 5.07 x 10<sup>31</sup> (10<sup>50,706,024,009,129,200,000,000,000,000)</sup>, smaller than the above calculations.

Table 1 summarizes the above discussion plus a couple of extra commonly seen numbers.

In conclusion, one *asamkhyeya* may be as small as  $10^{51}$  or as large as  $10^{74,436,000,000,000,000,000,000,000,000,000}$ , or somewhere in between, depending on the text source. The upper bound is based on *Gandavyuha* whose sequence of numbers is most extensive among all sources.

## Notes計:

- \* On p. 480 of Pruden's translation, the sixteenth place should read the sixtieth place instead. Also on the same page, *laksha* (1000,000) should read 100,000 instead.
- # This number is indeed too large to be calculated with a personal computer as rightly pointed out by Mochizuki (IABS 2008); however, its power can still be accurately computed.
- + An abbreviated list of these numbers also appears in Roll 65 (Chap 39) of this Sutra. 本經第65卷亦較簡略的列出這些數字。

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Table 1. Comparisons of Some Numbers from *Kosha* and Various *Avatamsaka Sutras* (numbers listed are powers of 10) 表一、華嚴經三種譯本及俱舍論中常見數值之比較(表列值爲10的次方)

	俱舍論	四十華嚴	六十華嚴	八十華嚴
	Kosha	Gandavyuha	60 Rolls Avat.	80 Rolls Avat.
洛叉 Laksha	5	5	5^	5*
俱胝 Koti	7	7	10	7
那由他 Nayuta	11^^	28	40	28
阿僧祇 Asamkhyeya	51-59	7.44 x 10 <sup>37</sup>	$5.07 \times 10^{31}$	$7.10 \times 10^{31}$
不可說 Ineffable		4.88 x 10 <sup>42</sup>	3.32 x 10 <sup>36</sup>	4.65 x 10 <sup>36</sup>
不可說不可說		1.95 x 10 <sup>43</sup>	1.33 x 10 <sup>37</sup> **	1.86 x 10 <sup>37</sup>
Ineffable Ineffable				

^ Called 百千;稱爲『百千』

\* Assumed value; 設定値

^^Called 那庾多;稱爲『那庾多』

\*\* Called 不可說轉轉;稱爲『不可說轉轉』

## References 參考資料:

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- 2. Buddhism A to Z, compiled by Ronald B. Epstein, Burlingame, CA: Buddhist Text Translation Society, 2002.
- 3. *The Flower Ornament Scripture*, Book 30 The Incalculable, p.201, vol.2, translated by Thomas Cleary, Boston: Shambhala, 1986.
- 4. *Abhidharmakosha*, Roll 12 (Chapter 3), by Vasubandhu, translated into Chinese by Xuan Zang.《阿毘達磨俱舍論》卷12〈分別世品第三〉,世親菩薩造、玄奘大師中譯. CBETA, T29, no. 1558, p. 63, b13-c12.
- 5. *Abhidharmakoshabhasyam of Vasubandhu*, vol. 2, Chap. 3, English translation by Leo M. Pruden, Berkeley, CA: Asian Humanities Press, 1991.
- 6. *A Manual of Buddhist Philosophy* by W.M. McGovern, pp.39-41, London: Kegan Paul, Trench, Trubner, 1923, reprinted by Chinese Materials Center, San Francisco, 1977.
- 7. Bon-Zo-Kan-Wa Shiyaku taiko Honyaku myogi taishu, by Sakaki Ryozaburo et al., 翻譯名義大集,日本京都文科大學藏版, No. 8041-8, Tokyo: Suzuki Gakujutsu Zaidan, 1962.
- 8. Buddhist Cosmology by W.R. Kloetzli, p.117, Delhi: Motilal Banarsidass, 1983.
- 9. *Gandavyuha*, Roll 10, translated by Prajna. 《大方廣佛華嚴經》(四十華嚴) 卷10 〈入不思議解脫境界普賢行願品〉. CBETA, T10, no. 293, p. 704, c28-p. 706, a12.
- 10. *Avatamsaka Sutra*, Roll 45 (Chapter 30), translated by Shikshananda. 《大方廣佛華嚴經》 (八十華嚴) 卷 45〈阿僧祇品第三十〉. CBETA, T10, no. 279, p. 237, b15-p. 238, b6.
- 11. Avatamsaka Sutra, Roll 29 (Chapter 25), translated by Buddabhadra. 《大方廣佛華嚴經》 (六十華嚴) 卷29 〈心王菩薩問阿僧祇品第二十五〉. CBETA, T09, no. 278, p. 586, a13-c15.