，所以科學家易於學佛。

7•3•2 無畏施之價值

在佛教裏我們有三種布施：(1)財施，(2)法施，和(3)無畏施。第一種布施是最常見的，包括財物的布施。第二種是功德較大的傳授佛法的施。第三種「無畏施」是科學發現，如同巴士德[6]發見細菌改善治病救了無量數的人，愛迪生發明電燈使世界普遍得到光明，倍耳[7]發明電話使人類靈通消息，裨益全人類。

在後面的例子裏，以佛法看，如發明家不在謀利，那功德是無量的。如我們參考金剛經[8]，佛說「如菩薩不著相而行布施，其福德不可思議。」這句話合於一條數學原理。如果以X代表布施，以Y代表所希望的報酬，於是 X/Y 比便是比較值。現在布施完全不受酬，那Y便＝0。依照數學方式，X/Y＝X/0＝∞。那就是以0除X，商數是無限大。這功德是無量大，佛陀所說實在符合數學的原理。

註 解

1. 因明大疏抄，大正藏卷六十八頁 582。
2. 蘇格拉底，469—399B.C., 希臘哲學家。
3. 福音者，傳新約聖經的。
4. 「南無大菩薩」——佛禪傳美，島野榮道著，美國國會圖書館卡片76—11286，紐約舞臺藝術書店出版，頁 107。
5. 凱爾文爵士（湯母森威廉），1824—1907，英國物理及數學家。
6. 巴士德路易士，1822—95，法國化學及微生物學家。
7. 倍耳阿力山得哥拉漢，1847—1922，美國物理家，以發明電話出名。
8. 金剛經，大正藏卷八頁 748。

（待續）

和綜合的組織知識。但著者要指出的是，當我們工作於科學和哲學時，我們所有的學問智識都得自外來，並不深探內在[4]。

在這個世俗世界裏，我們建立了一個不斷增長積聚的科學知識。我們應用和受益於這種科學知識庫。「應用的科學」就是「技術」或「工程學」如同前第三章「工巧明」所討論的。

這些科學用來解決長期或短期的人類生活問題的。當我們的物質世界進步時，由於基本研究的關係，科學知識就不斷補充。結果，在了解外在世界的現象和事物方面，人類知識力不斷增加其作用。佛陀所說所用的「因明」，有助於現代世界的演進。

7•3 科學研究非爲自利

上節我們曾討論過科學。現在我們談一談基本研究，可分爲(1)理論或分析研究及(2)實驗研究。二種都需要，而且互相補助。凱爾文爵士[5]曾說過，所謂科學，都應該是可以度量的，我們不但可感到其性質，抑且可測定其數量。因爲它是可量的，所以它可用數學的公式表示，以顯示其各部分關係。因此科學家可以數學分析而研討之，這就是理論研究。但由數學公式預測之結果，必須以實驗研究證明，於是科學才成立。佛法有理論亦有證驗，無異科學。

7•3•1 佛教非自利

在許多經典上，佛陀不斷的說，努力於理論及應用研究非爲自利，因爲佛教「不執我」。正與歷來科學家研究的精神相符。但有人會問爲什麼科學家致力於科學研究，有時甚至於如研究原子，能危及自己生命？答案是眞正科學家作研究的動機是出於「慈悲」，他們的目標是爲達成更好的、更公平的世界

世界上，除你自己外沒人可以解決你的問題！要知道一個佛徒和一個大中學學生一樣要自修作業，下功夫解決難題，然後能獲成績一樣的道理。這不是每個人最直接、最現實的辦法嗎？

佛訓是教每人自求解脫，每個人都有能力以身求解脫。如法句經XX. 4說：「你必須自修自證，因爲佛僅指示你道路。」佛教不相信「超神論」。只重視自己的佛性，不崇拜其他。在佛寺和佛教徒家裏所看到的佛像，並不是偶像。那是代表釋迦佛或菩薩給與我們的教訓：智慧、慈悲和功德力的象徵，所以有「法身」之稱。它的用處是喚起我們求覺悟的精神。

7•1•2 追求眞理

佛教獎勵自由思想。在佛教裏「疑」是明眞理和精神進展的「五蓋」之一，「蓋」就是障碍。疑不是「罪」，因爲在佛教裏沒有迷信。事實上，佛教裏沒有像其他宗教所了解的「罪」名。舉例說一個大學生在求解科學問題時，他會發生疑問而不能進修。在他再進行前他必須先去除「疑」，然後學業才能前進。我們必須除去「疑惑」或「謬見」，然後能學佛。佛獎勵他的弟子追求眞理。佛陀最注意「却疑」和「正謬」。這種追求眞理的精神使信徒以理智來信佛教，是「理信」不是「迷信」，因此他們修行的每一階梯，都靠有自信心，他們信佛法是由於信「眞理」。

7•2 「因明」之現代解釋

因明一詞，現代可了解爲「科學化」。科學發現是人類爲求了解外界事物而作的努力。它幫助我們組織經驗以備將來之應用。事實上，所有的科學都是由於調查、觀察、比擬、分析

⑶結論：

所以鯨魚是溫血的。

B. **因明**⑴

⑴宗：

鯨魚是溫血的。

⑵因：

因爲鯨魚是哺乳動物。

⑶喻：

（正）所以很顯然，像狗貓一類的哺乳動物，是溫血的。

（反）也很顯然，像魚蟹一類冷血動物不是哺乳類。

從以上看，用喻之因明比用大前提的推論式更爲完善。這種方法自然是用演繹法而得到結論。這是一個很强的工具。佛用它來研究事實得到眞理，與弟子討論眞理，和與異教徒辯論，都能站得住而取勝。

7•1 佛教中之邏輯（理則）學

邏輯（理則）學之精要可由佛訓中看出。一般都欣賞佛訓是人文主義的，蘇格拉底哲學的⑵，有時福音的⑶，但最重要的是同聽科學的課程一樣，它是合理的與科學的，他成功地發展了⑴是在自修、自得、自作的日常生活裏領會，⑵好研究審問，探討眞理，和具有自信心的科學精神。

7•1•1 自修自得

法句經XII. 4述及佛的最重要教訓是「自己是自己的歸依處，其他何人可以作你的歸依處？」這句話最合理，因在這個

五 明

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第五章

7•0 因明——理則學

因明一辭是印度字的理則學。在佛世，理則學是用純智慧發掘眞理和揚棄誤謬的基本方法。它是現代科學所根據的基本衡理工具。但佛學中所用的研究方法，更爲小心更爲無錯。在佛學，爲尋求眞理學者必先本身掃除污染及心理偏差。然後，他方可得到眞實結論。

佛教與其他宗教的差別，就是佛教用因明論理學——相似於現代科學的歸納法和演繹法。我們可拿它與理則學的推論式使用二種前提（大前提與小前提），然後用理則以推斷結論相比較。因明與上述的相似，但次序顚倒。其步驟是(1)述理，(2)述因，(3)舉例（一正一反）。以下解釋其步驟之精義：

A. 推論式（理則學）

(1)大前提：

所有哺乳動物都是溫血的。

(2)小前提：

鯨魚是哺乳動物。

That is something x divided by zero, the quotient is infinite.

References (T refers to the Taisho Daizokyo, the first no. following refers to vol., and next no. page.)

1. The Great Commentary on Yin Ming, T68.582.
2. Socrates, 469-399 B.C., Greek Philosopher.
3. Evangelic, carriers of teachings of the New Testament.
4. "Namu Dai Bosa"=A Transmission of Zen Buddhism to America, by Nyogen Senzaki, Soen Nakagawa, and Eido Shimano, Library of Congress catalog card no. 76-11286, published by Theatre Arts Books, New York, pp.107.
5. Lord Kelvin (Wm. Thomson), 1824-1907, British physicist and mathematician.
6. Louis Pasteur, 1822-95, French chemist and bacteriologist.
7. Alexander Graham Bell, 1847-1922, U.S. physicist, most well known for his invention of the telephone.
8. Diamond Sutra, T8.748.

(To be continued)

material giving, (2) Dharma giving, and (3) Fearless giving. The first type of giving is the most common. It consists of material gifts or money. The second type of giving is the transmission of the Dharma to others, which is considered as very meritorious. An example of the third type of giving is a scientific discovery which is beneficial to all mankind, such as the discovery of bacteria by Louis Pasteur[6] for curing our diseases, the invention of the electric lamp by Thomas Edison or the invention of the telephone by Alexander Graham Bell.[7]

In the last case, if the inventor harbored no thought of reward for his endeavor, then his merit would be infinite from the Buddhist point of view. If we would refer to the Diamond Sutra,[8] the Buddha says "If a Bodhisattva performs acts of charity without characterizing attributes or abiding in forms, then his merits will be immeasurable." This statement actually represents a mathematical truth. If any giving be represented by x, and any expected reward or attribute be represented by y, then the ratio of x/y will be comparison value. Now as the giver conceives absolutely nothing for return, then the term y is zero.

Mathematically, $x/y=x/o=\infty$

which can be called science must be measurable so that we can have not only a qualitative feeling but also a quantitative measurement. Since it is measurable, it can be expressed in a mathematical formula which will show logically the relationships of the various factors involved. Thus, the scientists can investigate it analytically by mathematics, that is theoretical research. However, what is predicted by mathematics must be proven by experimental research. Then the science is established.

7.3.1 NO SELF-GAIN IN BUDDHISM

As repeatedly stated by the Buddha in many a sutra, the endeavor of theoretical or experimental research is not for personal gain because the scientist forgets hinself. Yet one may ask why he should devote himself to scientific research, sometimes even at the risk of his own life, such as in nuclear research? The answer is that the motive for the research by the real scientist is out of his compassion and that the sole aim of his effort is towards the goal of a better, or equitable world. Hence scientist is prone to learn Buddhism.

7.3.2 THE VALUE OF "FEARLESS CHARITY"

In Buddhism, we have three kinds of giving: (1)

working on the assumption that whatever knowledge we acquire lies outside of us, leaving our inner self untouched.[4]

In this mundane world, we have built an increasing reservoir of scientific knowledge. We are applying and are being benefited by these resources of scientific knowledge. The applied sciences are known as technologies, or engineering processes, as previously discussed in "Chapter III Kung-Chiao Ming".

These sciences are required for finding long-term as well as short-term solutions to human problems. Scientific knowledge is continually being updated through basic research, as our material world advances. As a result, human intellectual power has been continually extended by many orders of magnitude in regard to the understanding of phenomena and things of the external world.

7.3 SCIENTIFIC RESEARCH NOT FOR SELF-GAIN

We discussed the sciences in the previous paragraphs. Here we want to talk about basic research, which may be divided into (1) Theoretical or Analytical Research and (2) Practical or Experimental Research. There is a great need for both and they are complimentary. According to Lord Kelvin,[5] any knowledge

because there are no articles of "blind faith" in Buddhism. In fact, there is no "sin" in Buddhism, as "sin" is understood in some religions. Take the example of a college student, when he works on a scientific problem he comes to a doubt and doesn't know how to proceed, he must clear his doubt before proceeding further. The root of all evil is doubt or false views which must be cleared or corrected. The Buddha encouraged his disciples to be inquisitive. He was most eager to dispel doubt, or correct wrong views. This spirit of truth searching causes the devotee's belief in Buddhism to be based on reasoning and not on blind faith. Thus, each step they take on the Buddha's path is with self-confidence.

7.2 MODERN MEANING OF "YIN MING"

The term "Yin Ming" can also be interpreted today as a generic word of human endeavor for understanding the things and phenomena of the external world, known as scientific discovery. It helps us to organize the knowledge thus obtained for future application. As a matter of fact, all sciences are nothing but organized knowledges based on investigation, observation, analyzing and synthesizing. However, the author wants to point out that when we work in the areas of science and philosophy, we are always

out home-work or problems for his own credit and attainment. The only reliable way to open the gate is to use your own working mind. Is it not the most straightforward and realistic way for everyone?

The Buddha's teaching encourages each person to cultivate himself for his own emancipation. Man has the power to liberate himself from all hindrances through his own personal effort and intelligence, as cited in the Dhammapada XX.4: "You should do your own work, for the Tathagatas only show you the way." Buddhism does not believe in the existence of some "Supreme Being". It worships no one else except the inner self or each one of us. The images to be seen in temples or in the homes of some Buddhists are not idols. They are merely symbols of the wisdom, compassion, and strength of virtues of the Buddha Sakyamuni who gave us the teachings, or of the Bodhisttvas. Their purpose is to remind us of the spiritual qualities we seek to awaken in ourselves.

7.1.2 BE INQUISITIVE FOR TRUTH

Buddhism encourages freedom of thought. In Buddhism, doubt is considered as one of the Five Hindrances to the clear understanding of Truth and to spiritual progress. Doubt, however, is not a "sin",

safer to state than the statement of a major premise used in syllogism. This method naturally and consistently arrives at the conclusion by way of the deductive method. It was a strong tool that the Buddha used in investigating the facts, in his quest for truth, in discussing things with his disciples, and in his rigorous arguments with the heretics.

7.1 LOGIC IN THE BUDDHA'S TEACHINGS

The essence of logic can best be seen from the Buddha's teachings. People generally appreciate the Buddha's words as humanistic, Socratic,[2] sometimes Evangelic,[3] but above all rational and scientific, as if we were listening to scientific lectures. He has succeeded in developing a spirit of (1) Do it yourself in everyday life, (2) Be inquisitive for truth, and self-confident in belief.

7.1.1 "DO IT YOURSELF"

One of the Buddha's most important teachings as stated in the Dhammapada XII.4 is "One is one's own refuge, who else could be the refuge?" This saying is most rational, since in this world no other person can solve your problems, except yourself! Its rationalism lies in the fact that a devotee of Buddhism, just as a university student or a high school pupil, should work

syllogism, but in a reverse order. The process consists of (1) stating the principle, (2) presenting the cause, and (3) making the examples (one positive and one negative). To illustrate the procedures, the following is intended to show the essence:

A. Syllogism (Logic)

(1)Major Premise:

All mammals are warm-blooded.

(2)Minor Premise:

Whales are mammals.

(3)Conclusion:

Therefore, whales are warm-blooded.

B. "Ying Ming"[1]

(1)Principle:

Whales are warm-blooded.

(2)Cause:

Because whales are mammals.

(3)Examples:

(Positive) It is therefore evident that mammals, such as dogs and cats, are warm-blooded.

(Negative) It is therefore also evident that cold blooded creatures such as fish and crabs are not mammals.

From the above, it can be noticed that the examples used in "Yin Ming" are more complete and

CHAPTER V

7.0 "YIN MING"-THE LEARNING OF LOGIC, OR THE SCIENCE OF REASONING (IN SANSKRIT, HETU VIDYA)

The term Yin-Ming was derived from the Indian word for logic. In the Buddha's time logic was a basic way of researching with pure wisdom to reason out the truth, and to cast off falsehood and fallacies. It is the basic tool of reasoning, upon which all modern natural sciences are built. However, the research method used in Buddhism is even more cautious and free from human error. According to Buddhism, to investigate the truth, the investigator himself must first be free from defilements and mental bias. Then he can obtain the true results.

A major difference between Buddhism and other religions is that the Yin-Ming method of reasoning, which is similar to the iuductive and deductive methods used in modern science, is strictly applied in Buddhism. We may compare it with the "syllogism" of logic in which two premises-one major and one minor-are presented, and then a logical conclusion is drawn from them. Yin Ming is very similar to the above-mentioned

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