中國科學主義

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Chinese Scientism

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1

緒言

輔大學生：

- 基督宗教徒3%（1%爲天主教，2%爲基督教徒）
- 佛教或其他台灣民間信仰 35%
- 無宗教信仰 50%以上

（Chou and Budenholzer 1988）

- 超過50%的學生表達他們沒有宗教信仰，爲什麼？
- 是否和科學已使宗教無存在必要的看法有關？

2

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3

古代中國科技

- 中國悠久歷史中，許多事物皆經仔細地觀察並被記錄下來，特別是天文學、生物學及曆法三方面。中國也發展出與其他古文明並駕齊驅的科技（Needham 1975）。
- 但是一直到與歐洲、美國和日本的科學、技術人員大規模的接觸後，它才發展出歐洲17、18世紀的實證、方法論合一科學。
- 西方科學首先由耶穌會傳教士於明末清初傳入中國，其中Mateo Ricci（1552—1610）、Johann Adam Schall von Bell（1592—1666）及Ferdinand Verbiest。（1623—88）也許最爲人所知。但是，他們的傳授地點僅限於宮廷內且影響的官員不多，一直到清朝末年、民國初年時（1911之後），西方科學才散布至全國各地。

4

西方科學大量進入中國及其對知識的影響：「中學爲體，西學爲用」

- 從十九世紀初，與歐洲（特別是英國）的貿易逐漸增加，而隨著貿易日漸密切發展而來的是雙方的衝突。
- 軍事上的挫敗使中國軍備現代化的呼聲愈來愈高，中國領導者也意識到歐洲的軍事武力科技遠高於中國，並認爲唯有引進西式科技，中國才有重新振作的機會。
- 張之洞所提出的「**中學爲體，西學爲用**」正足以代表眾多知識份子對西學的態度。儒家思想提供社會道德的基礎，西方科技則協助中國現代化和國防武力。

5

中國科學主義

- 大批學生出國留學深造，先是到日本，接著是歐洲，而美國最受歡迎（Buck 1980）這些學生成了科技發展的核心人物，也是大幅改革中國知識界運動的領導人。
- 早期譯作影響知識份子最深遠的也許就屬嚴復（1853—1921）的作品。他翻譯成中文的作品包括赫胥黎的*Evolution and Ethics*，斯賓塞的*Synthetic Philosophy*，以及亞當斯密的*Wealth of Nations*等。
- 1903年中央發佈命令，要求將科學研究納入課程安排裡（Zen 1931:171），科舉制度也在1905年廢除，這兩起事件象徵中國社會正經歷巨大改變。

6

中國科學主義

- 1903年中央發佈命令，要求將科學研究納入課程安排裡（Zen 1931:171），科舉制度也在1905年廢除，這兩起事件象徵中國社會正經歷巨大改變。
- 由古代儒家思想代表科學的「格致」一詞轉換成「科學」一詞（Elman 1998），就足以見物理學、化學、生物學和其他自然科學都以新的形式呈現（Reardon-Anderson 1991）。

陳獨秀

- 陳獨秀曾接受古文教育且通過地方科舉考試，但他沒有進一步參與更高層的科考，而在1900年赴日深造，並在當地結識了許多年輕的革命家。
- 1907至1910年間，他居留在法國，後來因爲1919年凡爾賽條約將部份山東省割讓給法國，使得陳獨秀不再推崇法國。他和許多青年革命家都認爲，法國這項舉動有違歐洲民主的理想。他一從歐洲返國就提出，傳統中國文化必須被拋至九霄雲外。
- 他和志同道合者創辦了幾項刊物，其中最聞名的即是創立於1915年的「新青年」。科學被尊爲新時代的領導者。

1915年的「新青年」科學被尊爲新時代的領導者。

- 士不知科學，故襲陰陽家符瑞五行之說。....農不知科學，故無擇種去蟲之術。工不知科學，故貨棄於地。戰鬥生事之所需，一一仰給於異國。商不知科學，故惟識罔取近利。....醫不知科學，既不解人身之構造，復不事葯性之分析。菌毒傳染，更無聞焉。....其想像最神奇者，莫知"氣"之一說。....試遍索宇宙間，誠不知此"氣"之果爲何物也。凡此無常識之思維，無理由之信仰，欲根治之，厥維科學。夫以科學說明眞理，事事求諸證實，較之想像武斷之所爲，其步度誠緩，然其步步皆踏實地。不若幻想突飛者之終無寸進也。宇宙間之事無窮，科學領土內之膏腹待辟者，正自廣闊，青年勉乎哉。（新青年，1：1, 1915, 引自Kwok 1971:65）
- ....人類將來之進化，應隨今日方始萌芽之科學。日漸發達，改正一切人爲法則，使與自然法則有同等之效力，然後宇宙人生，眞正契合。此非吾人最大最終之目的乎？（新青年，2：5, 1917，引自Kwok 1971: 77）。

- 陳獨秀不是科學家，充其量他對科學的認識很基本，也不是特別有系統或原創力高的思想家，但是他的文章卻很有影響力，他的思想也代表了當時大多數人的感受。
- 但陳獨秀應是以共產黨創始黨員的身份一職最爲人所知，當時他是北京大學教授，與另一位教授李大釗（1888–1927）於1920年在北京成立共產黨第一個分會。不到一年之後，包含毛澤東在內的一個小團體在上海開會，即後來人稱的「第一屆中國共產黨大會。」

胡適

- 胡適對學術的涉略比陳獨秀深，當他還是青年學生時就受到改革思想的影響，特別是嚴復的翻譯作品對其衝擊最大。
- 1910年，他赴美於康乃爾大學研讀農業，但對文學及哲學的熱忱促使他後來轉至紐約哥倫比亞大學，在那裡深受實用思想家杜威的影響。
- 1917年，他返回中國並在北京大學任教。胡適與陳獨秀皆常爲「新青年」雜誌撰稿，但卻他認爲實用哲學可爲辯證唯物論提供另一種思考模式。
- 胡適雖然肯定中國傳統，但他注重科學，要求改革的呼聲與當時許多知識份子一樣強烈。

胡適文存

- 多學一點自然科學的知識與技術，那條路是活路，這條故紙的路是死路。三百年的第一流的聰明才智消磨在這故紙堆裡，還沒有什麼好成績。我們應該換條路走了。等你們在科學試驗室裡有了好成績，然後拿出你們的餘力，回來整理我們的國故。(胡適文存 引自Kwok 1971:95)

宗教的評論-陳獨秀

陳獨秀：

- 人民所崇拜的無用東西皆是垃圾和偶像，應該毀滅... 如果偶像不被摧毀，文明將無法由自欺的迷信和無理的信仰中掙脫。
- 天地間鬼神的存在，倘不能確實證明，一切宗教，都是一種騙人的偶像：阿彌陀佛是騙人的，耶和華上帝也是騙人的，玉旨大帝也是騙人的；一切宗教家所尊重的崇拜的神佛仙鬼，都是無用的騙人的偶像，都應該破壞！（《新青年》「毀滅偶像」，1918, 5：2，引自Kwok 1971：71）

宗教的評論-胡適

- 事實上，中國人不像印度人、日本人那樣虔誠，也無法達成基督教傳教士對他們虔誠信仰的期許，中國傑出的思想領導者皆是眾所皆知的不可知論 者(agnostics) 或甚至無神論者，年輕人也甚至公開反對宗教。雖然幾年前 激烈的反宗教運動已經轉弱，但不容否認的是，中國的知識份子對宗教漠不關心，整個知識界對宗教運動和宗教復興並不支持（Hu Shih1934：78原文爲英文）。
- 胡適指出，中國「宗教」一詞的「教」，含意是「教義」(teaching)或「訓示系統」（system of teaching）。
- 胡適引述吳稚暉（1864–1953）對於「科學與玄學論戰」的論述來結束他對中國宗教的探討。

「科學與玄學論戰」的論述

- 在這篇文章中，吳前輩毫不保留地接受宇宙的機械觀，並建立起一種人生觀，用他的話說，即「擺脫上帝一詞，趕走靈魂和神。」他將人定義爲兩隻手、一個腦且能製造器具的動物。這種動物藉由種種器具征服自然、改善生活並創造美好的文明。人類最偉大的發明是科學和它的各種應用，能加強人類工作和享樂的能力。吳先生認爲，科學和技術的進步大大地改善了人類的道德生活，而過去歷史上，人類的道德生活從未高於科學和技術的時代。

「科學與玄學論戰」的論述

- 他堅持，唯有科學才能使人類更好、更有道德。他試著證明舊有宗教系統和道德哲學中的道德觀只是空話，並不能在真實生活中實現。唯有科學能給予人類新的感情及爲善的能力，這是中古時代苦行僧所沒有的。人類必須依賴自己，唯有自己才能在長久的努力中增加能力、將知識和力量發揮到極至，並藉此力量解決生活的困難來提高道德...

當今發展評論與結論

共產主義

- 科學主義爲基礎
- 目前的情形

台灣

- 教育發展
- 迷信 superstition
- 基督宗教的反映

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宗教與科學：中國經驗

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I. 緒言

過去二十年來，我一直任教於輔仁大學化學系（註 1）。輔大位於台北的郊區新莊，爲一所都會大學。身爲天主教大學，輔大致力於提倡全體教職員及學生的宗教自由，並鼓勵所有學生瞭解他們的宗教傳統及基督宗教。宗教交流和合作相當受到重視。

由於台灣施行大學聯考，因此輔大學生的宗教信仰情況，基本上應與國內各公私立大學相去不遠。目前，輔大學生約有 3%爲基督宗教徒（其中 1%爲天主教，2%爲基督教徒，基本上爲長老教）。35%的學生認爲他們信奉佛教或其他台灣民間信仰；其餘 50%以上的學生認爲他們無宗教信仰（註 2）。筆者將佛教與民間信仰歸爲同一類，因爲兩者的總和均穩定地維持在 35%左右，其中佛教的比例在 2%以上至 20%之間，視受訪學生對問題的理解而定。這顯示出台灣的宗教融合相當普遍。值得一提的是，道教也列屬於民間宗教（Ross, 1981, Budenholzer and Chou, 1989）。

筆者探究台灣和中國大陸「宗教和科學」的關係乃基於三項觀察。首先，超過 50%的學生表達他們沒有宗教信仰，爲什麼？是否和科學已使宗教無存在必要的看法有關？第二，台灣對科學和技術的普遍評價很高，這令筆者聯想到美國的 50、60 年代。台灣的科學研究常有大筆經費贊助，並被認爲是經濟持續成長的希望。例如，向國科會申請經費的案例中，70%以上都獲允許。第三，學生和其他人皆曾表示，台灣的知識份子和教育界，如果不與宗教對立，似乎也對其抱持懷疑的態度。時常聽到這樣的問題：普遍的宗教或特定的宗教在何種程度上屬於歧異或誤導的迷信。

在此，筆者必須提出此類研究本身具有的問題。如果歐洲和美國的宗教研究中宗教和科學的畫分有問題，則在台灣更是如此。將 religion 翻譯成宗教一詞是晚近的事，其內含包括有神論、無神論（如回教和禪宗）以及一連串的傳統文化活動。事實上，學生表達他們無宗教信仰的一個原因是，「宗教」對他們而言，暗指清楚界定的團體活動，像是基督教會或某個所謂的新興教派聚會。「科學」這個詞的誕生也是最近的事。英美人士對科學的普遍認知即是物理和生物科學。上述的問題釐清後，台灣對於科學和宗教二詞的認知與當代歐洲和北美相當接近。

除了語言和觀念的差異，跨領域的研究擔負一個基本的問題（註 3）。原本在歐洲和美洲背景下跨神學與科學的研究，現在被移植到另一種不同的文化，亦即當代的中國大陸和台灣。

最後一點，台灣在文化上屬中國文化，我於文中所將論及之中國近代 150 年的事件，其發展已爲台灣當今的文化認知奠定了基礎。然而台灣人正逐漸地脫離對大陸的認同，這項轉變乃基於台灣在 1895 年以前的地位屬 「前線省」，之後 1895 至 1945 年間被劃爲日本殖民地，而二次世界大戰後，台灣和中國大陸即展開個別的發展。雖然我已到過中國大陸，但其各項經驗主要來自台灣。

II. 背景介紹

中國悠久歷史中，許多事物皆經仔細地觀察並被記錄下來，特別是天文學、生物學及曆法三方面。中國也發展出與其他古文明並駕齊驅的科技（Needham 1975），但是一直到與歐洲、美國和日本的科學、技術人員大規模的接觸後，它才發展出歐洲 17、18 世紀的實證、方法論合一科學。以數學作說明，中國的數學過去一直被稱做「演算」（Horng 1993:167），因此只強調利用計算方法以求二次方程式之根，但未考慮到負根或虛根的存在，也不注重發展方程式理論。

隨著明末（1368—1644）耶穌會傳教士到來，中國開始和西方科學展開較直接的接觸。利瑪竇以及其後的傳教士將歐洲的科學和其他觀念介紹至北京宮廷中。即使雙方方法論不同，或甚至在知識和宇宙本質的看法上有更大的歧異，但都肯定精確計算的重要性（Gernet 1993:93）。因此中國的數學家，特別是已參與過曆法改革者，都準備運用來自歐洲的新技術。這項努力加上歐基里德的《幾何學概念》等書的中譯工作，爲後來中國科學和技術的發展奠定基礎。

從明朝一直至清朝晚年，以儒家思想最爲正統，特別是朱熹（1130—1200）所提倡的新儒道。儒家的經典四書，即論語、孟子、大學、中庸，爲教育與科舉制度的基礎，並成爲從地方至中央高層統治的依據。雖然不可妄下結論，但我認爲儒家思想基本上關切的是人際關係的倫常以及道德和倫理問題。孔子思想中有一種思想特質，存在於賢人與其他人、及最終與天、道的關係，天即是人類本質的來源。中庸當中的幾句話足以說明（Chan 1963; Tu 1989）。

> 天命之謂性；率性之謂道，修道之謂教。道也者，不可須臾離也…
>
> 喜怒哀樂之未發，謂之中；發而皆中節，謂之和。中也者，天下之大本也；和也者，天下之達道也。致中和，天地位焉，萬物育焉（section i）。

…修身以道，修道以仁。仁爲人也；親親爲大（section xx）。

君臣也，父子也，夫婦也，昆弟也，朋友之父也：五者，天下之達道也…子曰：「好學近乎智，力行近乎人，知恥近乎勇。知斯三者，則知所以修身，知所以修身，則知所以治人，則知所以治天下國家矣。」

您可能已經發現到，當我分析輔大學生的宗教信仰時，並沒有提及儒道。當今在台灣，儒家思想並不被認爲是一種宗教信仰，因此並不會包含在社會學領域或宗教研究的問卷裡。但就許多方面而言，不論現在或過去，儒道的確扮演宗教的功能。因此，在民國初年時（1914—1916），有人就曾提議將儒道變成國教。

佛教在第一世紀以前由印度傳入中國，並逐漸在中國文化中漸漸本土化。許多佛教文獻已翻譯成中文並由中國學者加以補充註解。佛教對中國知識歷史有深遠的影響，也提供人民日常生活中遭遇困難時所需的慰藉，而除了某些短暫的期間之外，佛教從沒有像儒家思想一般成爲國定的的信仰或哲學。

對大部份中國人而言，他們的宗教生活特色是一連串的儀式與信仰，通常也被稱做民間宗教或民俗宗教（folk religion），從每年農曆新年慶祝新生的家庭祭拜到人死後的道教喪禮儀式都包括在內。祭拜祖先、安撫並祈求土地公與諸神、卜卦與治病等儀式，全都屬於民俗傳統複雜網絡的一部份。道教對上述習俗的影響至深，而佛教、儒道與各種萬物有靈論的信仰也有其影響力。中國帝國晚期的學者、官員一方面篤信儒教傳統，一方面也參與民間宗教的各種儀式（Watson 1985）。

我之前已提過科舉制度，它是中國各朝代任命官員的依據，科舉考試先在地方舉行，之後才有更高層的考試。明、清兩代的國學及歷史研究皆是以四書爲基礎，而稍後也發展出天文學、數學、曆法等問題的研究，但是他們都附屬於古典學問架構之下。

III. 西方科學大量進入中國及其對知識的影響（註 4）

如上所述，西方科學首先由耶穌會傳教士於明末清初傳入中國，其中 Mateo Ricci（1552—1610）、Johann Adam Schall von Bell （1592—1666）及 Ferdinand Verbiest（1623—88）也許最爲人所知。但是，他們的傳授地點僅限於宮廷內且影響的官員不多，一直到清朝末年、民國初年時（1911 之後），西方科學才散布至全國各地。

滿族對中國統治於十九世紀式微。從十九世紀初，與歐洲（特別是英國）的貿易逐漸增加，而隨著貿易日漸密切發展而來的是雙方的衝突。第一次鴉片戰爭（1839

—1842）的效應雖有限，但卻促成了中國沿海和西方商賈更多的接觸。接下來的衝突，即第二次鴉片戰爭（1856—60），使得 1860 年英法聯軍得以暫時佔領北京。後來 1885 年，法國佔領中國的朝貢國越南，對中國政府是進一步的羞辱。其中與歐洲簽訂條約的一項重要內容即是，外國傳教士能夠在中國境內擁有財產。但中國所遭受的最大軍事挫敗是對日本在 1895 年的甲午戰爭，在馬關條約中，台灣及其周圍島嶼由中國割讓給日本。

軍事上的挫敗使中國軍備現代化的呼聲愈來愈高，中國領導者也意識到歐洲的軍事武力科技遠高於中國，並認爲唯有引進西式科技，中國才有重新振作的機會。在此政策下所產生的機構，也許最爲人所知的是於 1865 年成立的江南製造局，及 1866 年成立的福州造船場。之後還有其他技術學校及機構接著成立。當時最重要的活動之一是將西方科學和技術作品翻譯成中文的工作，而這項任務的困難在於，要從西方科學的許多觀念發展出一套全新的中文字彙，許多傳教士對這項工作不遺餘力，最有名的也許是英國傳教士 John Fryer（1839—1928），他在江南製造局工作，並之後成爲加州柏克萊分校的東方語文學系教授（Bennett 1970; Reardon-Anderson 1991:17-52）。十九世紀後半期，現代通訊和工業開始發展，包括航運、電報、煤礦和紡織。

張之洞所提出的「中學爲體，西學爲用」，正足以代表眾多知識份子對西學的態度。儒家思想提供社會道德的基礎，西方科技則協助中國現代化和國防武力。

十九世紀的後幾十年中，大批傳教士到達中國，其中三分之二爲基督教教徒，三分之一爲天主教徒。1889—90 年間抵達中國的新教徒傳教士（包含配偶）共有 1296 人，天主教傳教士達 639 人（Latourette 1967: 405, 329）（註 5）。即使許多傳教士並非具有科學專才，但卻相當熟稔當時的科學知識，並將之視爲福音傳教的一部份。新建學校，特別是傳教士創立的，提供了傳統學校以外的另一種選擇，並強調科學和技術教育。雖然許多傳統學者對新式學校抱持十分懷疑的態度，然而新學校提供了另一種選擇，並且受到新興商人階級子女的青睞。這些新學校有的後來發展成基督教大學，其中最有名的應屬成立於 1870 年的北京燕京大學（Lutz1971）。過去當某些知名大學的學生於街頭抗議中要求更好的科學教育時，往往最佳的科學教育就在基督教大學裡。

當時有一種風潮一直持續至今日。大批學生出國留學深造，先是到日本，接著是歐洲，而美國最受歡迎（Buck 1980）。這些學生成了科技發展的核心人物，也是大幅改革中國知識界運動的領導人。

很快地，大家瞭解到現代科學無法輕易由其學理基礎分離開來。一方面這暗示西學系統的組織和發展策略需要建立，另一方面，中國知識份子則開始翻譯西方哲

學著作（註 6），並撰寫他們對西方思想的評論。早期譯作影響知識份子最深遠的也許就屬嚴復（1853—1921）的作品。他翻譯成中文的作品包括赫胥黎的 *Evolution and Ethics*，斯賓塞的 *Synthetic Philosophy*，以及亞當斯密的 *Wealth of Nations* 等。

1903 年中央發佈命令，要求將科學研究納入課程安排裡（Zen 1931:171），科舉制度也在 1905 年廢除，這兩起事件象徵中國社會正經歷巨大改變。新的科學課程基本上由西方傳入，因此傳統中國科學和西方實證科學並不連貫。由古代儒家思想代表科學的「格致」一詞轉換成「科學」一詞（Elman 1998），就足以見物理學、化學、生物學和其他自然科學都以新的形式呈現（Reardon-Anderson 1991）。

我們或許難以想像廢除科舉制度與告別傳統的含意。基本上它代表知識份子、上流階層統治體系的瓦解，當時對科技的依賴應大於傳統思維，即不認爲將國家治理好，行政官員需依儒教思想進行修身。

在此背景下，許多人培養了所謂的折衷觀念，即肯定科學及其假設的價值，但同時保有許多傳統的中國信念。孫逸仙（1867—1925）被尊爲中華民國的國父，本身即接受過西方醫學教育的薰陶。他和蔣介石（1887—1975）兩者都非常尊崇科學，也不認爲應當摒棄傳統儒家價值觀。這在 1934 年蔣中正發起的「新生活運動」中的政治篇說明得很清楚，它結合了科學、現代化的理念和傳統儒教的美德（Briere 1956:36）。這些民族主義領導人和他人主張科學與傳統並行，被許多人批評爲思想上不連貫（philosophically inconsistent）。事實上，這反映了許多平凡百姓的看法。

有些人主張妥協，即現代實證科學或至少其方法論，已經隱含於儒教傳統中。1935 年，蔣中正於一場演講中宣佈「科學精神與科學方法」：

> 本來現在所謂科學，就是我們中國以前所謂格致之學，而『格致』兩個字，又是根源於《大學》『致知在格物』這句話而來的。可見中國在二三千年前，就有科學了；既然有了科學，當然就有科學方法。因此，科學方法也並不是現代才發明，更不是只有外國才有的。在孔子時代就已經講得很明白，他所謂：『物有本末，事有始終，知所先後，則近道矣。』就是治學與辦事最基本的科學方法（蔣介石[1]1935 年 一月 28 日演講，引自Kwok 1971:186）。

有兩點值得注意。首先，有人提出，自從明末耶穌會教士抵達中國以來，存在於古代中國的科學和科學方法就已經以不同的形式出現。第二，中國領導者爲保存

[1] 《蔣總統集》Vol. I P.850

古老文化傳承，感到他們必須辯護現代化的科學也是中國傳統的一部份，這顯示出現代實證科學在中國受歡迎的程度及其重要性。

許多知識份子認爲，要從傳統中國思想與現代科學及其相關的哲學思想間取得妥協是不可能的。中國唯一的希望在於拋棄過去，並依循現代科學的精神重整社會。即使很多思想家皆有討論的價值，但筆者在本文將主要探討兩位：陳獨秀（1879—1942）和胡適（1891—1962）。陳獨秀是共產黨創黨元老之一，並對共產黨政府盡忠。胡適則跟隨國民黨到台灣，並擔任中央研究院院長。儘管兩人的政治立場不同，但都堅持唯有科學和「科學的哲學」(scientific philosophy) 才是中國新興的希望。

陳獨秀曾接受古文教育且通過地方科舉考試，但他沒有進一步參與更高層的科考，而在 1900 年赴日深造，並在當地結識了許多年輕的革命家。1907 至 1910 年間，他居留在法國，後來因爲 1919 年凡爾賽條約將部份山東省割讓給法國，使得陳獨秀不再推崇法國。他和許多青年革命家都認爲，法國這項舉動有違歐洲民主的理想。他一從歐洲返國就提出，傳統中國文化必須被拋至九霄雲外。他和志同道合者創辦了幾項刊物，其中最聞名的即是創立於 1915 年的「新青年」。科學被尊爲新時代的領導者。

士不知科學，故襲陰陽家符瑞五行之說。....農不知科學，故無擇種去蟲之術。工不知科學，故貨棄於地。戰鬥生事之所需，一一仰給於異國。商不知科學，故惟識罔取近利。....醫不知科學，既不解人身之構造，復不事葯性之分析。菌毒傳染，更無聞焉。....其想像最神奇者，莫知“氣”之一說。....試遍索宇宙間，誠不知此“氣”之果為何物也。凡此無常識之思維，無理由之信仰，欲根治之，厥維科學。夫以科學說明真理，事事求諸證實，較之想像武斷之所為，其步度誠緩，然其步步皆踏實地。不若幻想突飛者之終無寸進也。宇宙間之事無窮，科學領土內之膏腴待辟者，正自廣闊，青年勉乎哉。（新青年，1：1, 1915, 引自 Kwok 1971:65）

....人類將來之進化，應隨今日方始萌芽之科學。日漸發達，改正一切人為法則，使與自然法則有同等之效力，然後宇宙人生，真正契合。此非吾人最大最終之目的乎？（新青年， 2：5, 1917 ，引自 Kwok 1971: 77）。

陳獨秀不是科學家，充其量他對科學的認識很基本，也不是特別有系統或原創力高的思想家，但是他的文章卻很有影響力，他的思想也代表了當時大多數人的感受。但陳獨秀應是以共產黨創始黨員的身份一職最爲人所知，當時他是北京大學教授，與另一位教授李大釗（1888—1927）於 1920 年在北京成立共產黨第一個分會。不到一年之後，包含毛澤東在內的一個小團體在上海開會，即後來人稱的

「第一屆中國共產黨大會。」

胡適對學術的涉略比陳獨秀深，當他還是青年學生時就受到改革思想的影響，特別是嚴復的翻譯作品對其衝擊最大。1910 年，他赴美於康乃爾大學研讀農業，但對文學及哲學的熱忱促使他後來轉至紐約哥倫比亞大學，在那裡深受實用思想家杜威的影響。1917 年，他返回中國並在北京大學任教。胡適與陳獨秀皆常爲「新青年」雜誌撰稿，但卻他認爲實用哲學可爲辯證唯物論提供另一種思考模式。

胡適（註 7）雖然肯定中國傳統，但他注重科學，要求改革的呼聲與當時許多知識份子一樣強烈。

多學一點自然科學的知識與技術，那條路是活路，這條故紙的路是死路。三百年的第一流的聰明才智消磨在這故紙堆裡，還沒有什麼好成績。我們應該換條路走了。等你們在科學試驗室裡有了好成績，然後拿出你們的餘力，回來整理我們的國故。（胡適文存[2]，引自Kwok 1971:95）。

和陳獨秀一樣，胡適雖然提倡科學但本身並非科學家，但當時受日本或西方科學訓練回國的科學家與日遽增，許多都受到西方潛在實證科學家的影響，並能呼應當初國內激烈思想家的呼聲。中國科學研究機構接著逐漸發展，許多皆循西方的發展路線。例如，丁文江於 1913 年成立「地質測量局」，之前他就是留學英格蘭和蘇格蘭。之後於 1927 年，中央研究院成立，是後來中國大陸和台灣的首要研究機構。

西方幾位重要的哲學家於這段期間拜訪中國並發表演講。杜威（John Dewey）於 1919—1921 年間走訪中國，並在十一個省分演講；稍後，羅素（Bertrand Russell）也拜訪中國。他們的演講稿經過翻譯，與中國學者所作的評論一同刊載在各家報紙。杜威於 1919 年演講中的一段話可以讓我們一窺當時他們的思想。

當今世界最緊迫的問題即是，用科學的權威取代傳統的權威… 因此，問題便　在於尋找出取代的方法，並演化此方法使科學的權威能和過去、現代傳統的權威一般（Dewey 1973:167）。

在眾多知識份子革命的呼聲中，也有另種強烈的意見，警告以科學爲重心的生活方式會有危險，並認爲應回歸傳統價值觀才是。這些互異的聲音引發了 1923 年所謂的「科學與玄學論戰」（張君勱，丁文江 1997 [1925]），重新思考第一次世

[2] 頁: 11
《胡適文存III，治學的方法與材料》

界大戰後西方文化的優越性。張君勱（1886—1969，西方人稱其爲 Carsun Chang）即因發起這場辯論頗受肯定，他的思想與當時一些其他的哲學家，皆承襲 Bergson 的思想。

故科學無論如何發達，而人問題之解決，決非科學所能為力，惟賴諸人類之自身而已。而所謂古今大思想家，即對於此人生觀問題，有所貢獻者也。譬諸楊朱為我，墨子兼愛，而孔孟則折衷之者也。自孔孟以至宋元明之理學家，側重內心生活之修養，其結果為精神文明。三百年來之歐洲，側重以人力支配自然界，故其結果為物質文明。（張君勱《人生觀》[3]，引自Kwok 1971:141-2）。

這場辯論同時也在北京各大報開戰，地理學家丁文江即是提倡科學的主要發言人。

即使西方文明已經崩潰（事實未然），絕對非科學所造成，國際間的衝突才是罪魁禍首。至於該爲戰爭負責的是政治家和教育家，因爲這兩類人士不具
科學精神。

他們這班人的心理很像我們的張之洞要以玄學為體科學為用，他們不敢掃除科學，因為工業要利用他，但是天天在那裏防範科學…所以歐美的工業雖然是利用科學的發明，他們的政治社會卻絕對的缺乏科學精神…人生觀不能統一也是為此，戰爭不能廢止也是為此…到了如今，歐洲的國家果然都因為戰爭破了產了。然而一班應負責任的玄學家，教育家，政治家卻絲毫不肯悔過，反要把物質文明的罪名加到純潔高尚的科學身上。（張君勱《人生觀》，引自Kwok 1971:145-46）。

大部份的知識份子都參與了這場辯論，包括陳獨秀和胡適。辯論的結果並沒有輸贏，但是辯論的預設立場卻和稍早起了變化，即雙方同意「科學」是現代、實證的「科學」，並已從歐洲傳至美國，問題在於，科學在那個程度上，能夠提供一種生活方式。

雖然日本很早就已進入中國，但中日大規模的戰爭卻是 1937 年才展開。共產和國民兩黨的內戰總是存在於中日兩國的衝突中。大規模的內戰於 1946 年爆發，並於 1949 年國民黨退守台灣才結束。辯證惟物論當時被認爲是最終的科學哲學，成爲中國的國家哲學（state philosophy）。在台灣，知識份子於傳統和科學上的研究享有較大的空間，但仍應避免涉及國民政府的敏感問題，且不論本土或外來的宗教都得以發展。但是，台灣知識份子和政府教育政策的共識，絕大部份

[3] 頁: 12
《科學與人生觀論戰》P.9

來自上述的經驗。

IV. 宗教的評論

我們不難想像陳獨秀、胡適以及其他提倡科學的領導人對宗教的態度。對陳、胡二人而言，中國的傳統宗教是中國文化中最糟的一環，陳獨秀一如平常地極力批評。

> 人民所崇拜的無用東西皆是垃圾和偶像，應該毀滅… 如果偶像不被摧毀，文明將無法由自欺的迷信和無理的信仰中掙脫。

> 天地間鬼神的存在，倘不能確實證明，一切宗教，都是一種騙人的偶像：阿彌陀佛是騙人的，耶和華上帝也是騙人的，玉皇大帝也是騙人的；一切宗教家所尊重的崇拜的神佛仙鬼，都是無用的騙人的偶像，都應該破壞！（《新青年》「毀滅偶像」，1918, 5：2[4]，引自Kwok 1971：71）。

胡適於 1933 年在芝加哥大學演講「中國的文藝復興」一題，指出中國缺少宗教熱誠。

> 事實上，中國人不像印度人、日本人那樣虔誠，也無法達成基督教傳教士對他們虔誠信仰的期許，中國傑出的思想領導者皆是眾所皆知的不可知論者 (agnostics) 或甚至無神論者，年輕人也甚至公開反對宗教。雖然幾年前激烈的反宗教運動已經轉弱，但不容否認的是，中國的知識份子對宗教漠不關心，整個知識界對宗教運動和宗教復興並不支持（Hu Shih1934：78 原文爲英文）。

胡適指出，中國「宗教」一詞的「教」，含意是「教義」(teaching)或「訓示系統」（system of teaching）。

> 因此「教」一字使用在佛教、道教、回教、基督教和儒教，全部皆爲道德訓示系統，教導道德的生活是其精髓所在；神明只是被用來同意教義的一種方式，這是中國宗教觀念的本質（Hu Shih 1934：79 原文爲英文）。

他提出，老子是自然主義哲學家，自然過程認同「道」，而孔子是人文主義者、不可知論者，他們最終都屈服於中國人的「本土理性心態」（native rationalistic mentality）（Hu Shih 1934：85 原文爲英文）。胡適認爲儒教已被用來合理化過去歷代王朝的政策。因此，爲避免誤解，他引用陳獨秀反對將儒教變成國教的論述。

[4] P.89

胡適引述吳稚暉（1864—1953）對於「科學與玄學論戰」的論述來結束他對中國宗教的探討。

> 在這篇文章中，吳前輩毫不保留地接受宇宙的機械觀，並建立起一種人生觀，用他的話說，即「擺脫上帝一詞，趕走靈魂和神。」他將人定義爲兩隻手、一個腦且能製造器具的動物。這種動物藉由種種器具征服自然、改善生活並創造美好的文明。人類最偉大的發明是科學和它的各種應用，能加強人類工作和享樂的能力。吳先生認爲，科學和技術的進步大大地改善了人類的道德生活，而過去歷史上，人類的道德生活從未高於科學和技術的時代。
>
> 他堅持，唯有科學才能使人類更好、更有道德。他試著證明舊有宗教系統和道德哲學中的道德觀只是空話，並不能在真實生活中實現。唯有科學能給予人類新的感情及爲善的能力，這是中古時代苦行僧所沒有的。人類必須依賴自己，唯有自己才能在長久的努力中增加能力、將知識和力量發揮　到極至，並藉此力量解決生活的困難來提高道德…
>
> 吳稚暉先生現年六十八歲，在他身上我們看到知識、理性的生活哲學，這不單是西方科學的影響，同時也是這項影響和中國人自然、理性傳統的完美結合（Hu Shih 1934：91—93 原文爲英文）。

胡適正確指出，對宗教的批評，特別是存在於知識份子間的批評，來自西方和本土力量的衝擊。至胡適於 1933 年於芝加哥大學演講時，已經沒有人再懷疑西方科學是否會被中國接受。科學已是中國文化的一部份，而且已由「西方科學」演變爲存在於現代國際間的「實證科學」。長久以來廣用於中國大陸和台灣的傳統醫學自從與「西方」醫學接觸後，也做了大幅改變（Zhao 1991）。在此背景下，我們並不訝異，許多知識份子不加以批判，便接受了「科學主義。」不少西方知識份子認爲，這是現代實證科學發展的合理結果。

中國的儒教傳統，雖不排除要超越物質世界，但強調的卻是人際關係（註 8）。此外，哲學的道教和儒教皆主張（儘管方法不同），事實的基礎不在超越物質世界（指相似人性的世界而言），而在最終遍於宇宙的無位格原則（impersonal principle）（註 9）。中國傳統的倫理和不可知論，與普遍存於歐洲和美洲的人文和無神論科學主義相互呼應。即使是儒教本身也感到受限於傳統管理的拘束，並阻礙中國發展。因此應捨棄傳統，重用科學（Kwok 1971）。

儒教和佛教的緊張關係一直存在著。雖然兩方皆爭辯何謂「道德的宇宙」（moral universe），且相互間的影響皆有完善的記錄，儒教主義者一直不解的是佛教的「厭

世」（world denying）主義（Gernet 1985:172 ff）。這個批評爲科學改革者所接受。此外，中國佛教有宇宙沈思和豐富的民間神話，許多人無法接受，因此佛教受到排斥（胡適 1934：84—87）。

對大部份中國人而言，他們的宗教生活通常是「民間宗教」或「民俗宗教」。雖然民間宗教的根源在傳統儒教、道教和佛教，但許多儀式、習俗、信仰和價值觀，隨著不同族群的語言和種族而異。他們爲的是追求更好的生活：家庭和諧、健康、長壽和興隆。每個人皆參與某種形式的民俗傳統，宗教和生活不可分。同時，知識份子和各階層的政府官員都擔心，地方教派會影響國家安寧，或與常規相離太遠（Watson 1985）。革命運動的宗教力量如太平天國（1850—1864），和宗教家的過渡狂熱，使得許多人對民間宗教抱持懷疑的態度。隨著科學受歡迎的程度漸增，取信於未受教育者的流行宗教被視爲迷信，並應革除。

在上述的背景之下，對基督教的評論實具教育意義。即使有人看法不同，但大家普遍認爲科學源自西方。自 16 世紀耶穌會教士抵達中國以來，就有人批評基督教爲外來宗教。（佛教一直受到相同的批評。）但是支持西方科學者若因基督教爲外來宗教則加以攻擊並不妥當。

科學於基督教歐洲的發展受到肯定，傳教士將科學傳入中國的貢獻也備受感激。不只如此，基督教活躍而且博愛。基督教傳教士的貢獻如建立醫院、學校、孤兒院等，深受肯定並被視爲西方文化的精華。因此，陳獨秀雖曾說耶和華是假的，卻常引用聖經的話，並大力讚揚基督教倫理教義的價值（Kwok 1971:79）。但陳獨秀和胡適等人終究批評，基督教的儀式、聖經和教義，與中國傳統的民間宗教一樣是不被接受的。

V. 當今發展評論

我將對當今情勢提出評論並做結語，內容大部份將針對台灣，少部份針對中國大陸。本文開始時提到，一半以上的普通台灣大學生說他們沒有宗教信仰。這在何種程度上是受到本文主旨所描述的影響？據學生所言，宗教與科學的衝突並非主因（註 10）。當被問到「科技與宗教的關係」時，39.4%的學生說科技能「提昇宗教信仰」，而 45.7%的學生說「沒有影響」。只有 13.7%的學生認爲，科技「導致宗教沒落」，或「證明宗教只是迷信」。在另一個相關的問題中，11.2%的學生認爲，「爲追求真理，唯有使用科學的方法，宗教毫無用處」。6.2%認爲「唯有宗教才能使人獲得真理」，而 82.4%認爲「必須科技與宗教並重，才能獲得真理。」在另一個有趣的問題中，當他們被問到大部份科學家的宗教立場爲何時，46.1%回答「對此問題，我無法判斷」，40.7%認爲大部份科學家「有宗教信仰」，只有 13.2%認爲大部份科學家「是無神論者」，或「不關心宗教問題」。

所以情況到底如何？首先，宗教一直遭受激烈的批評。當學生被問到，科學和宗教對立的原因爲何，最普遍的答案是，「宗教產生迷信。」還有濫用宗教的問題，1998 年三月正當筆者撰寫此篇論文時，有一群台灣人前往德州達拉斯的郊區，等待上帝在電視上、或駕著飛碟來顯靈，結果並未如願。這樣的事件並不會讓學生或家長特別擔心，許多學生關心的問題是，如何分辨「真的宗教」與「迷信。」

問卷中的最後一個問題是，科學和技術的目標和過程是否會危害「人的尊嚴」（human dignity）和「生命的神聖」（sanctity of life）？27.9%的學生回答他們無法判斷，55.5%回答科學的負面影響「很大」或「適中」。台灣雖然已有傲人的經濟成就，但卻大肆地破壞了原有的自然環境。科學和技術仍有瓶頸待加克服（註 11）。

普遍而言，台灣的主要宗教並未對科學和技術所提出的挑戰做出回應，如果以 Ian Barbour（Barbour 1997：84）的分類法來看，宗教和科學本質上是獨立而且沒有互動的。

調查中，信奉佛教的學生認爲，宗教和科學產生衝突的可能性較低。佛教的理論和現代物理學存在有趣的相似之處，而佛教在西方傳播時，是以和現代科學獨特共容的姿態出現（Verhoeven 1997）。但是，佛教中心教義的物質短暫理論和佛教的民間習俗，使很多人懷疑，它是否和現代科學相容。佛教同時也被視爲與現代化過程和經濟發展較無關係。但至少在台灣，隨著佛教對社會福利的參與、與興建醫院、學校的貢獻，許多人對它開始改觀。佛教文化在台灣正逐漸復甦並致力於提昇佛教尼姑和和尙的教育程度。

基督宗教，特別是基督教，也許和現代科學關係最密切。傳教士在中國大陸和台灣對科學教育和醫學的貢獻眾所皆知。在台灣的八大私立大學中，其中四所即是基督宗教（天主教或基督教）大學，而另一所會談及其基督教來源，他們全都擁有優秀的科學和工程系所。

基督教的行動主義和它對社會事務的關心被認爲最符合科學精神。同時基督教強調清楚的教義，也符合科學方法，但是教義清楚也可能帶來衝突。如同西方，台灣的基督教徒擔心，科學和宗教對生命起源的不同看法可能引發衝突。

我不知任何有關「台灣科學和技術學者是否信仰宗教」的研究，但同意他們就某方面而言應是不可知論者。他們深受儒教傳統的影響，並有強烈的倫理責任。他們擔心新興宗教和民俗傳統的發展太過，而即使有人對不同宗教間的問題感興趣，但他們不太能很快就對它們產生認同。

中國大陸的情況很複雜，因此我除了提出一些看法之外，將不多作著墨。與台灣相同的是，中國大陸普遍而言，十分重視現代實證科學的價值，但也知道其侷限。雖然目前尚無正式的社會學研究，但所有的證據均指出辯證法唯物論已不再取信於大多數的知識份子和人民，（此處筆者所指的是，以辯證法唯物論爲基本人生觀，與強調社會主義或一黨執政無關。）這使得人們對傳統中國宗教和基督教的興趣增加。雖然正確數字很難估計，但天主教和基督教徒近年來明顯地增加，他們出入政府允許設立的教會或所謂的地下教會（註 12）。學術界對基督教興趣大增，同時也關心它與正在發展中的科學和技術文明關係（註 13）。

最後我想針對「使命」提出一些看法，即各種宗教傳統在面臨快速發展的科學和技術時的使命。某方面而言，他們都需面對現代科學和技術。筆者相信，不同宗教傳統間的對話內涵將很豐富，而基督教，因傳統上與科學發展最爲密切，將對這種對話有很大的貢獻。不同的中國傳統，即使在很多方面非常不同，對宇宙的共同瞭解爲價值取向（value laden），即深信儒教傳統的杜維明所稱的「道德形上學」（Tu 1989）。雖然這與傳統西方科學認識不同：人類和上帝於無價值、分子運動的世界中創造道德價值，但這種對道德宇宙的瞭解將會是這場對話的關鍵內容。

中國的宗教將會繼續散播教義，並進行福音使命（此一詞原本僅限於基督教）。此一使命成功與否將視他們在許多方面如何與現代社會互動，未來的社會一方面將受古老傳統的影響，一方面它在世界文化的地位將絕大部份由實證科學和技術決定。

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附註

1 本論文之英文稿中之專有中文名詞皆以刮號補充說明，並爲求編輯之便，發音皆以羅馬拼音呈現。

2 數據來自於兩個不同時間，因此並不一貫。在 Ross1988 年的調查中，9.8%的受訪者回答他們是新教徒，3.8%天主教徒。這項數據過去十年以來已大幅減少。現在天主教和新教徒加起來只佔學生總數的 3%，如文中所述。而信仰佛教、民間宗教和沒有宗教信仰的學生數據比例來自 1988 年 Ross、Budenholzer 與 Chou

的調查研究。根據各項顯示，這些數據所呈現的比例仍具時效性。至於學生信仰基督教的比例大爲減少的原因，將會於另一篇論文探討。

3 若要參考宗教與科學問題的概略探討方式，請見 Barbour（1997）。

4 此處介紹西方科學進入中國的探討方式，主要參考金耀基（1978）的模式。

5 1874 年的統計中，48%的傳教士爲美國人，44.5%爲英國人，7.5%爲德國人（Latourette 1967: 405, 329）。

6 評論演化思想之本土作家在語氣上充滿種族偏見，時常指責清朝國勢搖搖欲墜的統治者（Pusey 1983）。

7 胡適也許因提倡白話文最爲人所知。傳統上，中文以古文書寫，結構簡潔，能有效記錄少數菁英之思想。在康乃爾求學時，胡適即建議語言和文學的改革。這些改革稍後由其他人包括陳獨秀等推動。

1919 年五月 4 日，北京發生了大規模的學生示威活動，抗議的直接原因是，一次世界大戰後召開的凡爾賽和平會議，答應日本許多要求並犧牲中國權益。抗議接著散布到許多其他城市。接著五四運動爲中國社會不只在政治方面帶來巨幅的改變，文學、哲學皆受影響。

8 由輪語的一段話可看出這種態度。
樊遲問知。子曰：「務民之義，敬鬼神而遠之，可謂知矣。」

9 道德經的開頭幾行表達了這種基本觀念。
道可道非常道，名可名非常名。無名天地之始，有名萬物之母。

10 這項調查在筆者與 Chou1989 年的作品中有詳細說明。讀者可向作者索取。請見註 2 說明。

11 正當筆者撰寫此論文時，德國拜耳化學公司正好放棄在台灣省台中縣建造 TDI 工廠。主要反對勢力來自當地環保團體和民進黨。

12 《中國天主教介紹》預估，中國的天主教徒約有一千萬人，基督教徒一千四百萬人。而中國總人口共 12 億人（Charbonnier 1997:18-19）。

13 我於北京和美國與中國大陸學者討論中發現，許多人對宗教和科學這個議題感興趣。也許過去一直在傳統馬克斯模式中受教育，而現在能探討科學和宗教關

係的可能性對他們而言既新鮮又刺激。

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THE CHINESE EXPERIENCE

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I. **Introduction.**

For the last twenty years, I have been living in Taiwan and for most of those years have been teaching chemistry at Fu Jen Catholic University (輔仁大學). Fu Jen is a large urban university, located in Hsinchuang (新莊), a suburb of Taipei. As a Catholic university, Fu Jen on the one hand is committed to the religious freedom of its staff and students, and on the other encourages all students to better understand their own religious tradition as well as Christianity. Religious dialogue and cooperation is given a high priority. (cf. Statement of Mission, Fu Jen Catholic University)

Because of Taiwan's joint island-wide joint entrance examination, the religious breakdown of Fu Jen's students is essentially the same as it would be in any other public or private university in Taiwan. Currently about 3% of Fu Jen's students would be Christian (about 1% Catholic and 2% Protestant, primarily Presbyterian). About 35% would identify as either Buddhist or adherents of traditional popular religion. The remaining, well over half, would say they have no religious faith (沒有宗教信仰)[1] I have put Buddhism and popular religion (民間宗教) together since, while the sum of the two remains quite constant at about 35%, Buddhism can range anywhere between just over 2% to 20%, depending on how the question is understood. This is indicative of the syncretism which is part of the religious life of Taiwan. It should be noted that the traditional Chinese religion of Taoism would also come under the heading of *popular religion*. [Ross, 1981; Budenholzer and Chou, 1989]

Three observations led me to ask about the relationship of religion and science in Taiwan and China. The first is the fact that over 50% of our students say they do not have religious faith. Why is that? Is it related to a perception that science has made religion obsolete? Secondly, the general perception of science and technology in Taiwan is very positive. It reminds me of the United States in the 1950`s and 60`s. Science is very well funded and is seen as the hope for Taiwan's continued economic expansion. (Over 70% of the investigator initiated grant requests to the National Science Council – the Taiwan equivalent of the U.S. NSF – are funded.) Finally, there

are the anecdotal comments of students and others that the intelligentsia of Taiwan and its educational policies seem, if not hostile, at least suspicious of religion. A question often heard is to what extent is religion in general, or a particular religion, *superstition* -- 迷信, literally wayward or misguided belief.

That is the background. However, before beginning I should note the difficulties inherent in this kind of study. If the categories *religion* and *science* are problematic in a study of European or American religiosity, they are even more so in Taiwan. The word that translates *religion* in Chinese (宗教) is relatively recent and includes both theistic and non-theistic religions (e.g. Islam and Chan [Zen] Buddhism) as well as a whole range of traditional cultural activities. In fact, one of the reasons that many students say they do not have religious faith is that the word 宗教 also has the connotation of a fairly well defined community of practitioners – as for example in a Christian Church or one of the so-called new religions. The word for *science* (科學) is also of relatively recent origin. However, here the general understanding would be that of most Americans who understand *science* as primarily the physical and biological sciences. Thus, after all the appropriate caveats have been made, the understanding of the terms *religion* and *science* in Taiwan is reasonably close to what it would be in the contemporary United States.

Besides language and conceptual differences, there is also the basic problem of the multi-disciplinary nature of this kind of study.[2] The already cross disciplinary study of theology and science, usually studied in the context of Europe and the Americas, is now mapped onto a very different cultural reality – that of modern and contemporary China and Taiwan.

And finally one last point. Taiwan is culturally Chinese and there is no doubt that the events which I will discuss that occurred primarily in mainland China in the last one hundred and fifty years have laid the ground work for Taiwan`s present cultural understandings. However, the people of Taiwan are increasingly seeing their identity as somehow separate from that of the rest of China. This identity is based on Taiwan`s status as a `frontier province` before 1895, the Japanese colonial period from 1895 until 1945 and finally its separate development from Mainland China after the Second World War. While I have traveled in Mainland China, my experience is primarily from Taiwan.

II. **Background.**

During Chinas long history, meticulous observations were made and recorded particularly of astronomical, biological and medical phenomena. China also developed a multifaceted technology which was on a par with those of other ancient civilizations [Needham, 1975]. Yet the development of an empirical, methodologically unified science such as developed in Europe in the 17th and 18th centuries did not appear in China until after large scale contact with the European, American as well as Japanese scientists and technologists. Take, for example, mathematics. Chinese mathematics before the modern period has been described as `algorithmic` [Horng 1993, 167]. Thus the stress was on computational methods, allowing one to find, for example, the needed root of a quadratic equation without being concerned with negative or imaginary roots and without concern to develop a theory of equations.

With the coming of the Jesuit missionaries at the end of the Ming dynasty (1368-1644), there began the first relatively direct contacts with European science. Matteo Ricci and those that followed him introduced Western mathematics and other elements of Western science to the Beijing court. Despite differences of methodology and even larger differences on the very nature of knowledge and of the universe, there was agreement on the value of precise calculations [Gernet 1993, 93]. Thus Chinese mathematicians, especially those involved in the reform of the calendar, were ready to make use of the new techniques coming from Europe. This work together with the translation of works like Euclid's *Elements of Geometry* into Chinese laid the foundation for the later developments of science and technology in China.

During the Ming dynasty (1368-1644) and until the last years of the Ching dynasty (1644-1911) the overriding orthodoxy of China was Confucianism, particularly so-called neo-Confucianism usually identified with Chu Hsi (朱 熹, 1130-1200). The so-called four books of the Confucian canon – the Analects of Confucius, Mencius, the Great Learning, and the Doctrine of the Mean – were the basis of the educational system and of the civil examination system which was, in turn, was the basis of governance from the local to the highest levels of the empire. While one must be careful in making generalizations, I think it would be fair to say that Confucian thought is primarily concerned with the right ordering of human relationships and what we would normally label as moral and ethical questions. There is a transcendent element in Confucian thought, but it is primarily seen in the right relation of the sage to other human persons and then ultimately to the heavens (天), the source of

human nature and the way (the Tao, 道). I will read a few lines from the *Doctrine of the Mean* (中庸) to give some feel for the tradition [Chan 1963; Tu 1989].

> What Heaven (天) imparts to man is called human nature. To follow our nature is called the Way (道). Cultivating the way is called education. The Way cannot be separated from us for a moment…
>
> Before the feelings of pleasure, anger, sorrow and joy are aroused it is called equilibrium (中, the mean). When these feelings are aroused and each and all attain due measure and degree, it is called harmony. Equilibrium is the great foundation of the world, and harmony its universal path. When equilibrium and harmony are realized to the highest degree, heaven and earth will attain their proper order and all things will flourish. [Section i]
>
> The cultivation of the person is to be done through the way (道), and the cultivation of the way is to be done through humanity. Humanity (仁) is [the distinguishing characteristic of] man and the greatest application is being affectionate towards relatives…
>
> There are five universal ways [in human relations], and the way by which they are practiced are three. The five are those governing the relationship between ruler and minister, between father and son, between husband and wife, between elder and younger brothers, and those in the intercourse between friends. These five are universal paths in the world. Wisdom, humanity, and courage, these are the three universal virtues. The way they are practiced is one. [Section xx].

You may have noticed that in the introduction, when mentioning the religious faith of Fu Jen's students, I did not mention Confucianism. In contemporary Taiwan, it would not ordinarily be considered as a *religious faith* and would not normally be included in a sociological questionnaire on religious belief. Yet in many ways, even today and even more so in the past, Confucianism does function as a religion. Thus at the beginning of the Republican era, from 1914 to 1916, it was suggested that Confucianism become the state religion of the new Chinese Nation-State.

Buddhism was introduced to China from India probably before the first century of the Common Era and gradually became truly indigenized in Chinese culture. A large number of Buddhist writings were translated into Chinese and supplemented by the

work of Chinese authors. Buddhism has had a tremendous impact on Chinese intellectual history and, of course, offered solace and meaning to millions of Chinese facing the hardships of ordinary life. Yet, except for relatively short periods, it never became a national religion or philosophy in the way that Confucianism did.

For most people of China, their religious lives are characterized by a large cluster of rituals and beliefs usually labeled as *popular religion* or *folk religion*. This can include everything from family rituals at the beginning of the lunar New Year celebrating new life to the Taoist funeral rituals at the end of life. Veneration of the ancestors, the appeasement and supplication of land gods and of other more auspicious deities, rites of divination and healing, are all part of the complex web of the folk traditions. Religious Taoism has had the clearest influence on these traditions, but Buddhism, Confucianism and various animistic beliefs all have had their impact. Most of the scholar officials of late imperial China, while on the one hand publicly professing the refined tradition of Confucius, would still join in the various rites of popular religion.

I have mentioned on several occasions the examination system. It was the key to administrative appointment in Imperial China. The examinations were held first at the local level and then one could proceed to a higher level. In the Ming and Ching dynasties, classical and historical studies predominated with the *four books* of Confucian tradition as the basis. There were also questions on astronomy, mathematics and calendrical studies. However, these questions were subsumed under a broader classical framework. [Elman 1998, 10].

III. The large scale introduction of Western science into China and its intellectual consequences.[3]

As mentioned above, Western science was first introduced into China by the Jesuit missionaries at the end of the Ming dynasty (1368-1644) and the beginning of the Ching (1644-1911). The names of Mateo Ricci (1552-1610), Johann Adam Schall von Bell (1592-1666) and Ferdinand Verbiest (1623-88) are perhaps the best known. However, much of what they had taught remained within the confines of the court and influenced relatively few scholars. It was only at the end of the Ching dynasty and the first years of the Republican era (beginning 1911) that Western science diffused throughout much of the country.

The 19th century was a time of decline for the Manchu rulers of China. Trade with Europe, especially Britain, had been gradually increasing since the beginning of the

century. However, with the increased trade there were also increased tensions. The hostilities known as the first opium war (1839-1842) were relatively limited but initiated larger contacts with Western merchants along the entire coast of China. Further conflicts with European powers, the second opium war 1856-60, including a brief Anglo-French occupation of Beijing in 1860, and the loss of the tributary state of Vietnam to the French in 1885 further humiliated the Chinese rulers. One important result of the treaties signed with Europe was that foreign missionaries were allowed to own property in the interior of China. But the most difficult loss for China was to Japan in 1895. In the treaty of Shimonoseki China ceded Taiwan and the outlying islands to Japan.

These military reversals brought increasing calls for modernization of Chinas military. Chinese leaders were aware of the technical superiority of the European military and argued that only by bringing in Western technology was there hope for a revitalized China. Perhaps the best known of the institutions to result from this policy were the Kiangnan arsenal (江南製造局), founded in 1865 and the Foochow shipyard in 1866. Many other technical schools and institutions followed. One of the most important activities of the time was the translation of foreign works on science and technology into Chinese. The difficulties of this translation work can be appreciated when it is realized that a whole new vocabulary had to be developed to express many of the ideas of Western science in Chinese. A number of lay missionaries were instrumental in this work. Perhaps the best known is the Englishman John Fryer (1839-1928) who worked at the Kiangnan Arsenal and who later became a distinguished professor of Oriental Languages and Literature at the University of California here in Berkeley [Bennett 1970; Reardon-Anderson 1991, 17-52]. During the latter half of the 19th century, there was also the beginnings of modern communications and industry – shipping, telegraph, the railroad, mining and textiles.

Among many of the intellectuals, the famous phrase of Chang Chih-tung (張 之洞 , 1837-1909) `Chinese learning as the substance, Western learning for application` (中 學 為 體， 西 學 為 用) epitomized their attitude toward Western learning. Confucian thought would provide the moral basis for society; western studies of technology would provide the tools for China's modernization and defense.

During the last decades of the 19th century there was also a huge influx of missionaries, about two-thirds Protestant and about one-third Catholic. In 1889/90 there were 1296 Protestant missionaries (including spouses) and 639 Catholic missionaries [Latourette 1967, pp. 405, 329].[4] Many of the missionaries, though not

professional scientists, were well versed in science of their day and freely used it as an ingredient of their evangelical mission. The founding of schools, especially by the Protestant missionaries, provided an alternative to the traditional Chinese centers of learning and often stressed scientific and technical subjects. While many traditional scholars were severely critical of the new educational institutions, they provided alternative places of education, especially for the children of the rising merchant class. Several of them gradually developed into the Christian universities of China. Probably the best known of these schools was Yenching University (燕 京 大 學) in Beijing, founded in 1870. [Lutz 1971] It has been commented that in later years when the students of the prestigious state universities were taking to the streets to demand better scientific training, the best scientific training was in fact to be found in the Christian universities.

At this time, there also began a phenomenon that has continued until this day. Large numbers of students went overseas, first to Japan and then to Europe and especially the United States for advanced education [Buck 1980]. It was these students who would provide the nucleus for developments both in technical fields as well as be the leaders of the movement to radically revamp the intellectual landscape of China.

It was soon realized, however, that modern science cannot be so easily separated from its intellectual moorings. On one level this implied the need for Western systems of organization and strategies of development. On a different level, Chinese intellectuals began translations of European works of philosophy as well as the writing of their own commentaries on Western thought. Probably the most influential of the earlier translations were those of Yen Fu (嚴 復, 1853-1921). Among the works he translated into more or less classical Chinese were Huxley`s *Evolution and Ethics,* Spencer's *Synthetic Philosophy* and Smith`s *Wealth of Nations*.

In 1903 there was an imperial decree requiring Western scientific studies throughout the educational curriculum [Zen 1931, 171]. In 1905 the imperial examination system was abolished. These two actions were symbolic of the massive changes that were occurring in Chinese society. The new scientific subjects were essentially imported from the West. There was a basic discontinuity between traditional Chinese science and the new empirical science. Physics, chemistry, biology and the other physical sciences had been essentially been reconstituted in a new mold [Reardon-Anderson 1991]. Perhaps symbolic of this is that even the word used for `science` changed from the earlier Confucian term 格 致 or 格 致 學 to the current term 科 學 [Elman 1998].

It is perhaps hard for us to imagine the tremendous break with tradition involved in the abolition of the traditional examination system. In principle it meant the end of the system of rule by the class of the scholar-gentry. Presumably there would be increased reliance on technical know how rather than the traditional presumption that the country would be best served when administrators had been encouraged to seek the self cultivation of the Confucian tradition.

In this context, many persons developed what might be called a common sense eclecticism – recognizing the value of science, including its presuppositions, but also choosing not to abandon many of their traditional Chinese beliefs. Sun Yet-sen (孫 逸仙, 1867-1925), considered the founding father of the republic and himself trained in Western medicine, and Chiang Kai-shek (蔣 介 石 , 1887-1975) both esteemed science very highly, yet did not feel called upon to reject traditional Confucian values. This approach was given political expression in the *New Life Movement* inaugurated by Chiang Kai-shek in 1934. It combined a faith in science and modernization with a reliance on the traditional Confucian virtues. [Briere 1956, 36]. These attempts by the Nationalist leaders and others to unite a high regard for science with the ancient Confucian tradition have been criticized as being philosophically inconsistent. However, they probably represent at least the mood and basic intuition of many ordinary people.

One avenue of reconciliation was the suggestion by a number of persons that modern empirical science, or at least its methodology, was somehow already, at least implicitly, present in the Confucian tradition. In 1935 Chiang Kai-shek declared in a lecture *Scientific Spirit and Scientific Method*:

> Actually what we nowadays call science is none other than what we Chinese have in the past called *ke-chih* (格 致). [As this approach is found in the *Great Learning* (大學)] we can see that China had science two thousand years ago. Since there was science, there must have been the scientific method. Thus the scientific method is not discovered in modern times, much less is it a sole possession of foreign countries. During the age of Confucius, this fact is already clear. What Confucius meant by `everything has its source, and everything has its beginning and end; when one knows the order of things, he is indeed close to the Tao` is the best scientific method for any scholarship and everyday handling of affairs. [Chiang Kai-shek, Lecture of January 28, 1935, quoted in Kwok, p. 186].

Two points should be noted. First, the suggestion that science and scientific method somehow go back to Ancient China had surfaced in one form or anther since the time of the Jesuit missionaries at the end of the Ming dynasty. Secondly, the very fact that many Chinese leaders who wished to preserve the ancient heritage felt compelled to argue that science in the modern sense was also part of China`s heritage, indicates the popularity and felt importance of modern empirical science in China.

Many intellectuals felt that the efforts to reconcile traditional Chinese thought and modern science along with its accompanying philosophy were doomed to failure. The only hope for China was to jettison its past and restructure society along the lines indicated by modern science. In this paper I will primarily refer to two thinkers, though many others could be cited: Chen Tu-hsiu (陳 獨 秀, 1879-1942) and Hu Shih (胡 適, 1891-1962). Chen Tu-hsiu was a founding member of the communist party in Beijing and remained loyal to the Communist government. Hu Shih followed the Nationalists to Taiwan and was the director of Taiwan`s *Academia Sinica*, a combination of a National Academy of Science and a government research institute in both the humanities and the natural sciences. Despite basic political differences, both argued strongly that science and a `scientific philosophy` were the only hope for a renewed China.

Chen Tu-hsiu had received a classical education and was successful in the district examinations. However, he himself decided against proceeding further in the examinations and in 1900 he left to study in Japan. In Japan he came to know many of the other young revolutionaries. From 1907 until 1910 he studied in France, a country he greatly admired until 1919 when the treaty of Versailles ceded part of Shantung Province to Japan, an action he and many other young Chinese revolutionaries considered a betrayal of European democratic ideals. Upon returning from Europe, Chen argued that traditional Chinese culture had to be left behind. He and like minded friends started several publications, the best know of which was the *New Youth* (新 青 年) founded in 1915. Science was to be the vanguard of the new era,

> Our men of learning do not understand science; thus they make use of *yin-yang* signs and beliefs in the five elements to confuse the world and to delude the people and engage in speculations on geomancy...Our farmers do not understand science; thus they do not posses methods of selecting crops and applying insecticides. Our men of industry do not understand science; therefore goods lie wasted on the ground, while we receive every need in

> warfare and production from foreign countries. Our merchants do not understand science, hence they know only short-term gains and make no provision for future profits. Our doctors do not understand science; they not only know nothing of human anatomy, but also know nothing of the analysis of medicines; as for bacterial poisoning and infections, they have not even heard of them...the height of their wondrous illusions is the theory of chi (氣), which really applies to the professional acrobats and Taoist priests. We will never comprehend this chi even if we were to search everywhere in the universe. All of these fanciful notions and irrational beliefs can be corrected at their roots by science, because to explain truth by science we must prove everything with fact. Although this is slower than imagination and arbitrary judgment, every progressive step is taken on firm ground. It is different from the flights of fancy, which in the end cannot advance one bit. The amount of truth in the universe is boundless, and the scientific realm's productive areas awaiting pioneering are enormous! Youth to the task! [New China, 新 中華 , 1:1 , 1915, quoted in Kwok, p. 65].

Only in conforming to the laws of science will there be true progress,

> I believe that in the future the true belief and course of action for humanity will be guided by the proper course of science...The future evolution and progress of mankind must be based on the budding science of today; we must seek gradually to improve man-made laws so that they conform with the results of natural laws. Only when this is done can life and the universe be in perfect union. This is our greatest and most final purpose! [New China, 新 中華 , 2:5 , 1917, quoted in Kwok, p. 77].

Chen Tu-hsiu was not a scientist and his understanding of science was rudimentary at best. He was not even a particularly systematic or original thinker. Yet his writings were very influential and his thought symbolized the feelings of many people of his time. However, Chen Tu-hsiu is probably best known as one of the founders of the Communist party. Chen, at that time a professor at Peking University, together with another professor, Li Ta-chao (李大釗) founded the first unit of the communist party in Peking in 1920. Less than one year later, a small group including Mao Tse-tung (毛澤東,1893-1976) met in Shanghai in what was later to be called the *First Congress of the Chinese Communist Party*.

Hu Shih was much more of an academic than Chen Tu-hsiu. As a young student, Hu

Shih was very much influenced by evolutionary thought, particularly the translations of Yen Fu. In 1910, Hu went to the United States to study agriculture at Cornell, but his literary and philosophical bent soon brought him to Columbia University in New York where he came under the influence of the pragmatist thinker John Dewey. In 1917, Hu returned to China and took a position at the National University of Peking. Hu along with Chen Tu-Hsiu was a regular contributor to the *New Youth* magazine. However, he felt that pragmatic philosophy offered an alternative to dialectical materialism.

Hu Shih[6] did have an appreciation of Chinese tradition, however, his calls for reform in the name of science were as strong as that of the other intellectuals of his day.

> We hope that they [the youth] come to an early realization and concentrate on the knowledge and methods of the sciences. This is the road of hope, whereas the other road, that among old books and papers, leads nowhere. Even the best talents and intelligence of the last three hundred years, spent wasted among books, did not produce any good results; we must therefore adopt another approach. Only after you [the youth] have achieved good results in the laboratory can you speak of and use your energies to tidy up our national heritage. [Collected Essays of Hu Shih, 胡適文存, quoted Kwok, p. 95]

Like Chen Tu-hsiu, Hu Shih while advocating the importance of science was not himself a scientist. There were, however, increasing numbers of scientists trained in either Japan or the West who were returning to China. Many had been influenced by the at least implicit empiricism of many Western scientists and upon their return to China, while less strident, often sympathized with the calls of the more radical thinkers. Chinese scientific institutions gradually developed, mostly along the lines of Western institutions. For example, the [Chinese] Geological Survey was founded in 1913 by Ting Wen-chiang (丁文江, 1887-1936) who had studied in England and Scotland. In 1927, the *Academia Sinica* was founded which was to be the premier research institution both in Mainland China and later in Taiwan.

Several important Western philosophers visited China and lectured during this period. John Dewey traveled in China between 1919 and 1921, lecturing in eleven provinces. Shortly afterwards, Bertrand Russell also visited China. Both men's works were translated into Chinese and translations of their lectures with local commentaries appeared in many Chinese newspapers. A quote from a lecture of John Dewey, given in Beijing in 1919 gives some flavor of their thought.

> The most pressing problem in the modern world is replacing the authority of tradition with the authority of sciences...The problem is therefore, one of finding ways by which we can substitute the authority of science for that of tradition, and of evolving means by which we can make the scientific method as authoritative for the future as tradition has been for the past, and still is for much of the present [Dewey 1973, 167].

Amidst the calls for an intellectual revolution, there were also strong voices warning of the dangers of the new stress on science as a way of life and suggesting a return to traditional Chinese values. These contrasting voices erupted in the so-called *metaphysical debates* in 1923. The background was a rethinking of the superiority of Western culture in the aftermath of the First World War. Chang Chun-li (張君勱, 1886-1969, known in the West as Carsun Chang) is generally credited with beginning the debate. Chang's own thought, along with a number of other contemporary philosophers, was dependent on the thought of Henri Bergson.

> [N]o matter how developed science is, it can never solve the problems of the philosophy of life, which depends entirely on man himself and nothing more...the great thinkers of the past and present have all had significant contributions to the question of the philosophy of life. For instance the school of Yang Chu accented the `I,` Mo-tzu emphasized love, and Confucius and Mencius followed the doctrine of the golden mean. From Mencius to Confucius down to the *li* school of the Sung, Yuan and Ming, the thinkers all gave priority to the cultivation of the inner life and hence brought about a spiritual civilization. Europe, on the other hand, for three hundred years concentrated on the control of nature by human power with the result that it produced a materialistic civilization. [Carsun Chang, The Philosophy of Life, 人生觀 , quoted in Kwok, p. 141-2]

In the debate, which raged in the popular press of Peking, the geologist Ting Wen-chiang was a chief spokesperson for science.

> Even if European civilization is bankrupt (actually this is not the case), the responsibility is absolutely not with science, because the main reason for the bankruptcy is international struggle. As for the responsibility for the war, it is politicians and educators who should be blamed. The majority of these two kinds of people are not scientific.

> The psychology of these people is very much like that of our Chang Chih-tung in their consideration of a metaphysics as a substance and science merely as a means of application...They do not dare do away with science, for their industries still rely on science, and yet they incessantly try to circumvent science...This is the reason why their politics lack absolutely the scientific spirit, even though their industries make use of scientific invention...This is why the philosophy of life cannot be unified and war cannot be abolished...Now that the European nations have actually experienced bankruptcy because of warfare, those metaphysicians, politicians, and educators who should really bear the responsibility not only did not repent, but tried to attribute to the pure and respected name of science the sinful name of materialistic civilization. [*ibid.* quoted in Kwok, p. 145-46]

The debate engaged most of the intellectuals of Beijing, including Chen Tu-hsiu and Hu Shih. There was, of course, no winner. But the very presuppositions of the arguments had shifted from earlier times. There was now agreement by those on both sides of the debate that *Science* was the modern, empirical *science* that had been transplanted from Europe and America. The question was to what extent this science could in itself provide a way of life.

Though Japan had been making inroads into China much earlier, the war with Japan began on a large scale in 1937. The civil war between the Communist and Nationalist forces was always in the background of the conflict with Japan. Full-scale civil war broke out in 1946 and ended with the Nationalist retreat to Taiwan in 1949. Dialectical materialism, which considered itself to be ultimate scientific philosophy, became the state philosophy of China. In Taiwan, intellectuals were allowed much more freedom to study both traditional and Western thought, with the presumption that topics sensitive to the Nationalist government were to be avoided. Religions, both indigenous and foreign, were allowed to develop. However, the consensus of Taiwan's intellectuals and the educational policies of the government were to a large extent determined by the experience described above.

IV. **The critique of religion.**

The attitudes of Chen Tu-hsiu, Hu Shih and the other leaders of the `pro science faction` are not hard to imagine. For both of them the traditional religions of China represented what was worst in the Chinese tradition. As usual Chen tu-hsiu stated it

most forcefully.

> All useless things, worshipped by the people, are rubbish and idols and should be destroyed...If such idols are not destroyed, humanity will never be freed from self deceiving superstitions and irrational beliefs.
>
> If the existence of the gods and spirits of heaven and earth cannot be proved accurately, all forms of religion are nothing but deceitful idols: the god Amida is false; Jehovah is false; the Supreme Lord of Heaven is false. All kinds of Gods, Budddhas, Immortals, Spirits revered by various religions are useless, cheating idols and must be destroyed. [On the Destruction of Idols, *The New Youth* 1918, 5:2, quoted in Kwok, p. 71.]

In his 1933 lecture, *The Chinese Renaissance*, delivered at the University of Chicago, Hu Shih noted approvingly the lack of religious sentiment in China.

> It is true that the Chinese are not so religious as the Hindus, or even as the Japanese; and they are certainly not so religious as the Christian missionaries desire them to be. Practically all prominent leaders of thought in China today are openly agnostics and even atheists. And the young men are even openly anti-religious. Although the fierce anti-religious movements of only a few years ago have now subsided, it cannot be denied that the educated people in China are indifferent to religion and that the whole intellectual tendency there is not favorable to any religious movement or revival. [Hu 1934, 78]

Hu notes that the term used for `religion` in China is *chaio* (教) which can best be translated as `teaching or system of teaching.`

> Therefore the term *chiao* is applied to Buddhism, Taoism, Mohammedanism, Christianity, as well as Confucianism. They all are systems of moral teaching. Teaching a moral life is the essential thing; and the `ways of the gods` is merely one of the possible ways of sanctioning that teaching. This is the substance of the Chinese conception of religion. [Hu 1934, 79]

He argues that Laotze (老子) was a naturalistic philosopher with natural processes identified with the Tao and that Confucius was a humanist and an agnostic. While Buddhism and Taoism had their moments of success, ultimately they succumbed to the `native rationalistic mentality` [*ibid.* 85] of the Chinese. Hu, while sympathetic to

Confucianism, notes that it had been used to rationalize the policies of the previous imperial governments. Thus, to avoid any misunderstanding, he then quotes Chen Tu-hsiu voicing his opposition to making Confucianism into something like a state religion.

Hu closes his consideration of religion in China by quoting approvingly the article of Wu Chih-hui (吳稚暉, 1864-1953), part of the collection of papers from the 'Metaphysical Debate.'

> In this essay the old scholar unreservedly accepted the mechanistic conception of the universe, and built up a philosophy of life which, in his own words, `rule out the term *God* and banished the soul or spirit.` He defined man as the animal with two hands and a big brain which enable him to make tools. This tool-making animal has been able to create a wonderful civilization, merely through the accumulation of tools with which he subdues nature and betters his own living. The greatest achievement of man is science together with all its applications which greatly multiply the power of man to do work and to produce things for his enjoyment and betterment. Mr. Wu holds that the moral life of mankind has greatly improved with the advancement of science and technology; and that man has never achieved a moral life anywhere or at any time in history which can be proved to be higher than that of the age of science and its machines.
>
> He maintains that no religion, but science alone, will be needed to make mankind even better and more moral. He tries to prove that all the moral sentiments expressed in the old religious systems and moral philosophies were merely empty words without the ability or the tools to realize them in actual life. It is science alone, which has given man not only the new sympathy, but the new capability to do good which the mendicant saints of medieval times could never possess. Man must therefore rely upon himself and himself alone in his ceaseless endeavor to increase his tools, to extend his knowledge and power to the utmost, and thereby to make himself more and more moral by being in possession of greater power to solve the difficulties of life....
>
> Mr. Wu Chih-hue is now sixty-eight years old. In him we see the intellectualistic and rationalistic philosophy of life which is not merely the result of scientific influence from the West, but is the happy combination of that influence with the whole naturalistic and rationalistic tradition of the

Chinese people. [Hu 1934, 91-93]

Hu Shih was surely correct that the strong critique of religion, especially among intellectuals, was a product of both foreign and indigenous forces. By the time Hu Shih gave his lectures at the University of Chicago in 1933, there was no question of whether or not Western science would be accepted in China. It was already part of the fabric of the culture and in that sense had already passed from being 'Western science' to being the modern international phenomena of 'empirical science.' Even traditional Chinese medicine, which is widely practiced in Mainland China and on Taiwan, had been radically altered through its contact with so called `Western` medicine [Zhao 1991]. Given this situation, it is not surprising that many intellectuals accepted in a relatively uncritical manner the *scientism* that was presumed by many Western intellectuals to be the logical consequence of modern empirical science.

Within China, the Confucian tradition, while not denying the transcendent, stressed human relationships.[7] Furthermore, philosophical Taoism and Confucianism both argued (though in different ways) that the basis of reality was not to be found in a transcendent personal being, somehow analogous to the human person, but in an ultimately unnamed impersonal principle, immanent in the cosmos.[8] I would suggest that the ethical and agnostic strains of an important part of traditional Chinese learning resonated with the humanistic and agnostic scientism so prevalent in Europe and the Americas. This is what Hu Shih describes as the 'naturalistic and rationalistic tradition of the Chinese people.' But even Confucianism itself was felt by many to be too tied to the traditional mode of governing and was an obstacle to China's development. Thus it was to be discarded and science would take its place [Kwok 1971].

There had always been a tension between Confucianism and Buddhism. While both argued for what might be described as a *moral universe* and while their mutual influence is well documented, Confucianists were troubled by the ultimately `world denying` doctrines of Buddhism [Gernet 1985, 172 *ff*]. Such critiques were accepted by the reformers. Furthermore, Chinese Buddhism had a tradition of cosmic speculation and a rich folk mythology that many found unacceptable. Thus Buddhism was to be rejected [Hu 1934, 84-87].

For the great majority of Chinese, their religious life expresses itself in what is usually known as 'popular religion' or 'folk religion.' While having its roots in traditional Chinese Confucianism and Taoism, as well as Buddhism, popular religion

encompasses a large range of rituals, practices, beliefs and values, varying considerably among the various ethnic and language groupings of China. Much of it is concerned with the search for a better life – family harmony, good health, long life and prosperity. On the one hand every person in China participated in one way or another in the folk traditions. There were no clear distinctions between the sacred and the secular. At the same time the intellegentia and government officials on various levels were always concerned that developments of local sects would not disturb public tranquillity or deviate too far from accepted norms [Watson 1985]. The religious roots of revolutionary movements such as the *Heavenly Kingdom of Peace* (太平天國 , 1850-1864) as well as more ordinary excesses of religious professionals, made popular religion suspect in the eyes of many. With the growing acceptance of science, popular religiosity while tolerated among the uneducated was seen by many as a vestige of superstition (迷信) that should be gradually eliminated.

In light of the above, the critique of Christianity is instructive. Despite suggestions to the contrary, there was general recognition that science had essentially been imported from the West. Since the time of the Jesuit missionaries in the 16th century, there had often been criticisms of Christianity as a foreign religion. (Similar criticisms have been and
continue to be made against Buddhism.) However for the proponents of Western science to critique Christianity on this basis seemed somewhat disingenuous.

It was also recognized that science had developed in Christian Europe and the role of the missionaries in bringing science to China was often spoken of appreciatively. Furthermore, Christianity was a religion of active and loving service. The good works of the Christian missionaries – hospitals, schools, orphanages – were appreciated and seen as exemplifying what was seen as best in Western culture. Thus Chen Tu-hsiu, quoted above as saying that the religion of Jehovah was false, often quoted the Christian scriptures and argued forcefully for the value of Christian ethical teaching. [Kwok 79] Yet ultimately people like Chen Tu-hsiu and Hu Shih argued that Christianity, with its rituals, scriptures and dogmas, was ultimately as unacceptable as the traditional and popular religions of China.

V. **Some comments on the current situation**.

I will close with a few comments on how I see the current situation. Most of my remarks will be addressed to the situation in Taiwan, with a few comments on Mainland China. At the beginning of this essay, I noted that over half of the students

in a typical Taiwan university said that they had no religious faith. To what extent is this the result of the developments described in the body of this paper? According to the students, the reason is not a conflict between religion and science.[9] When asked on the same questionnaire what is the 'influence of science and technology,' 39.4% said that it promoted religious faith while 45.7% said that it had no influence. Only 13.7% thought that science and technology lead to the decline of religion or proved religion to be superstition. In a related question, 11.2% of the respondents thought that 'in the search for truth, science is the only method.' 6.2% thought religion was the only way to truth, while 82.4% thought that 'only when science and religion are equally emphasized can we come to truth.' In another interesting question, when asked in their opinion, what was the faith stance of the majority of scientists, while 46.1% probably answered honestly that they had no basis for judgment, 40.7% felt that the majority of scientists are religious believers. Only 13.2% thought that the majority of scientists were atheists or not concerned with religious questions.

So what is happening? First some of the issues raised in the radical critique of religion are still present. When asked what are the reasons for the impression that science and religion are opposed, the largest group responded with the concern that `religion generates superstition (迷信). There is concern about the abuses of religion. In March of 1998 as this paper was being written, a group from Taiwan living in a Dallas suburb waited in vain for the appearance of God first on TV and then in a flying saucer. Such incidents are far from unique raising concern among students and even more so among their parents. A major question of many students is how to distinguish 'true religion' from 'superstition.'

In the final question of the student questionnaire, the students were asked whether 'goals and procedures of science and technology are harmful to human dignity and the sanctity of life.' While 27.9% answered that they had no basis for judgment, 55.5% replied that science was `extremely` or `moderately` harmful. While Taiwan’s economy has improved tremendously, the environmental price has been heavy. Science and technology have their limits.[10]

Taiwan’s major organized religions have not, in general, responded directly to the challenge posed by science and technology. To use the typology of Ian Barbour [Barbour 1997, 84], religion and science are seen as essentially independent and non-interacting.

Buddhist students in our surveys had a slightly lower sense of possible conflict

between religion and science. Buddhist speculations have some interesting parallels to areas of modern physics and Buddhism as preached in the West was presented as a religion uniquely compatible with modern science [Verhoeven 1997]. At the same time, the central Buddhist doctrines on the transitoriness of the material, as well as the folk traditions of popular Buddhism, have led many to question whether Buddhism is ultimately compatible with modern science. Buddhism has also been viewed as relatively disengaged from the process of modernization and economic development. At least in Taiwan, this perception is changing with Buddhist initiatives in social welfare and the founding of Buddhist technical schools. Buddhism in Taiwan is enjoying a modest revival and efforts are underway to boost the educational levels of the Buddhist monks and nuns.

Christianity, especially Protestant Christianity, is probably the religion most identified with modern science. The missionary contributions to science education and medicine, both on the mainland and in Taiwan, are well known. Of the eight largest private, comprehensive universities in Taiwan, four would identify themselves to be Christian universities and a fifth speaks of its Christian origin. All have strong programs in science and engineering.

Christian activism and engagement with social issues is felt to be particularly compatible with, at least, the spirit of science. Also the Christian stress on doctrinal clarity fits well with a scientific approach. Yet this same clarity can, of course, bring about conflicts. As in the West, many Taiwanese Christians are concerned about a seeming conflict between scientific and biblical accounts of the origins of life and the human species.

While I know of no formal studies, I think most would agree that the largest group of Taiwan's scientists and technologists would consider themselves in some sense agnostic. They have been formed in the Confucian tradition with a keen sense of ethical responsibility. They are wary of the excesses of the new religions and of the traditional folk religion. And while there would be some interest in the kinds of questions raised by the different religious traditions, they would be very slow to identify with any particular tradition.

The situation on Mainland China is a very complex one on which I hesitate to comment. However, for the sake of discussion, a few remarks are in order. Similar to Taiwan, there is both a strong popular appreciation of the value of modern empirical science, and, at the same time, recognition of its limits. However, while there seems

to be no formal sociological study, all evidence indicates that dialectical materialism has lost the allegiance of the vast majority of China's intellectuals and common people. (In saying this, I am talking of dialectical materialism as a basic philosophy of life, separate from questions of the need for a strong socialist program or a unified one-party government.) This has created a vacuum with a corresponding interest in both traditional Chinese religions and Christianity. Though solid numbers are hard to come by, both Catholic and Protestant sources have indicated large increases in recent years, both in government sanctioned churches and in the so-called underground churches. Among some academics, there is an increased interest in Christianity and especially its relationship to a developing scientific and technological civilization.

I would like to close with a few comments on *mission* – the mission of the various religious traditions as they face a rapidly changing scientific and technological society. In some way or other, all are going to have to come to terms with contemporary science and its handmaid technology. I believe this will be a fruitful area of dialogue between the various religious traditions. Christianity, which historically has the closest relationship with the development of science, has a special contribution to the dialogue. The various Chinese traditions, though in many ways radically different from each other, have a common perception of the universe as somehow value laden – what Tu Wei-Ming from the Confucian tradition calls a `moral metaphysics` [Tu 1989]. While seemingly at odds with the traditional Western scientific perception of an essentially valueless, material world of particles in motion, in which human persons, and possibly God, work out their moral futures, this understanding of the moral universe will be a key ingredient in the dialogue.

The religions of China will also continue to spread their message, to carry out their evangelical mission (to use a word originally confined to Christianity). The success of that mission will in many ways depend on how they are able to relate to a modern society. It is a society on the one hand shaped by ancient traditions and on the other taking its place within a global culture in large part defined by empirical science and technology.

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Notes.

[1]The figures given actually represent two different times, and therefore are not completely consistent. In Fr. Ross's 1988 survey 9.8% of the respondents answered they were Protestant and 3.8% said they were Catholic. This percentage has dropped precipitously in the last ten years. The total number of Catholics and Protestants now make up only about 3% of the student population as indicated in the text. The percentages for the number of students professing religious belief in Buddhism and popular religion and the percentage of students professing no religious belief are taken from the original 1988 surveys of Ross and of Budenholzer and Chou. All indications are that the qualitative picture represented by these numbers is still correct. The reason for the large drop in the number of Christian students would be the subject of another paper.

[2]For a general treatment of religion and science questions, see Barbour, 1997.

[3]In the thematization of the introduction of Western science into China, I primarily follow the categories of Chin, Yao-Chi [1978].

[4]In an 1874 tabulation, 48% of the Protestant missionaries were American, 44.5% British and 7.5% German [Latourette 1967, pp. 405, 329].

[5]It should be noted that often the early evolutionary thought was often quite racist in tone, usually directed against the Manchu rulers of the tottering China dynasty [Pusey, 1983].

[6]Hu is perhaps best remembered in his advocacy of vernacular Chinese (白話) in writing and publishing. Traditionally, Chinese was to be written in a classical style, a very compressed and terse style that effectively kept the written word as the provenience of a relatively small elite. Already as a student at Cornell, Hu had written suggesting reforms in Chinese language and the use of literature. These suggestions were reinforced by others including Chen Tu-hsiu.

On May 4, 1919, there were large student demonstrations in Beijing. The immediate cause of the demonstrations was the decision of the Versailles Peace Conference at the end of WW I to give in to many of Japan's demands at the expense of China. The demonstrations soon spread to many other cities. Soon the *May 4th movement* came to embody the vast changes in Chinese society, not only political but also literary and philosophical.

[7]A quote from the Analects is symbolic of this attitude.

> Fan Ch`ih asked about Wisdom. The Master said, `To work for the things the common people have a right to and to keep one's distance from the gods and spirits while showing them reverence, can be called wisdom.` [Confucius, Analects, Book vi, 22]

[8] The famous opening lines from the *Tao Te Ching* express this basic sense.

> The way that can be spoken of
> Is not the constant way;
> The name that can be named
> Is not the constant name.
> The nameless was the beginning of heaven and earth;
> The named was the Mother of the Myriad creatures. [Lau Tzu, I:1-2]

[9]The survey is discussed in more detail in Budenholzer and Chou, 1989. Copies of the results are available from the author. Note the caveat in note 1 above.

[10]Just at the time of the writing of this paper, the Bayer Chemical Company of Germany announced that it is abandoning plans to build a toluene diisocyanate (TDI) plant in Taichung. The reason was opposition from local environmental groups and the Democratic Progressive Party.

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