

The Intelligence Industry Revolution

智业革命

——致毁知识不可逆增长逼迫下的科技转型、产业转型与社会转型

Scientific and Technological Transition, Industrial
Transition and Social Transition under the Coercion of
Irreversible Growth of Ruin-causing Knowledge

刘益东 著



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导言

本书由理论篇（社会发展理论与科学革命理论）、历史篇（万年以来的两组大事）、挑战篇（人类面临的最大危机与挑战）、转型篇（科技转型、产业转型、社会转型）和启动篇（智业革命的启动方案）组成，讨论的核心问题是人类面临的最大危机、挑战及其解决之道。洞悉危机、捕捉机遇、趋利避害、实现目标，是大脑的核心功能。作为社会的智能系统，知识分子应自觉担负起社会航船的瞭望者和决策者的责任，这是由发现问题和解决问题都高度依赖专业知识所决定的。识别、判断最大的危机和挑战是确定、规划发展道路和战略的前提，是影响甚至是决定发展方向的关键因素。一旦最大的危机和挑战足以在中短期时间内导致毁灭性灾难，那么寻求解决之道就成为人类需要优先处理的头等大事。迄今为止，人们对人类面临的危机众说纷纭，环境资源问题、人口爆炸、全球化、大规模杀伤性武器、恐怖主义、科技发展失控、艾滋病、信仰与道德问题、贫富悬殊、外来天体撞击等都被称为最大或最大之一的危机。但是，在危机意识增强的同时，也出现了“预警疲劳”：人们已经习惯于在风险社会中生活了。那么，在中短期时间内究竟有没有足以导致毁灭性灾难发生的危机呢？这种危机一经发现能否很快化解呢？

作者提出和使用“致毁知识”概念并在世界上首次以它为切入点和研究对象，把对科技负面效应的泛泛研究，转换为对其核心问题——致毁知识的出现、增长、传播、应用和禁止的研究，将长期以来理解科技负面效应的“双刃剑”模式转变为“致毁知识”模式，系统地研究了致毁知识增长及其与科技、经济、社会的关系以及遏制方案，做出一系列新发现、新预言、新创造和新开拓。主要发现是：致毁知识增长是不可逆的，在市场经济这一目前世界主流社会发展模式下，致毁知识的增长又是不可阻止的；科技知识增长已经失控，这意味着人类面临毁灭的危险是不断累加的，达到一定程度必然会发生毁灭性灾难。这就是人类面临的最大危机与挑战。并由此做出五项预言：（1）美国模式行将崩溃或终结。美国模式高度依赖科技知识增长，作为致毁知识的大本营、集散地和增长源，最先面临毁灭性灾难的威胁，也因此难以为继，美国模式要么崩溃，要么终结。（2）眼前利益优先、丛林法则至上的核心法则行将终结。这两个支配社会运转、利益分配和国际秩序的核心

法则加速致毁知识增长，因此必须退居二线，将不再作为核心法则发挥作用。

(3) 科学重心转移，社会科学崛起。科学将从作为致富工具的财富型科学转型为作为社会智能系统的头脑型科学。(4) 创意产业取代高技术产业成为主导产业，实现产业转型。(5) 将发生“政府—市场”（官权—钱权）二元社会，向“政府—市场—学界”（官权—钱权—智权）三元社会的转型，形成智权知识社会。这三大转型构成了智业革命。本书的主要创造是提出了集团/平台适配系统理论、平台阶升式科学发展模式与平台转换的科学革命观、头脑型科学、公平和谐五项基本原则、全程安全的科学技术、园区型研究院、园区型大学、程序型学术评估法、查新分析以及客观高效的知识人才识别法等；主要开拓是初步创建了电子学务这一新型的学术领域，它以变革胜出机制为核心，以确立学术优先权制度、基本参考文献制度和信息技术深度应用为特征，以电子学务与创意产业结合为动力，以大幅压缩重复研究、遏制学术腐败为突破口。电子学务是智业革命的启动方案。

致毁知识不可逆与不可阻止的增长是人类面临的最大危机和挑战

以危机和挑战对人类生存的威胁程度为判据进行排序，就产生了最大的危机和挑战。最大危机和挑战应具备两个条件：一是本身具有极大的危害性，足以产生毁灭性灾难；二是化解它极为困难，往往是即使发现了它，在现有的条件下也克服不了，需要相当一段时间的努力才可能化解。前者是危机的危害程度，后者是克服危机的困难程度。危机不能立刻化解，这又增大了危机的实际威胁和危害性。所以，需要尽早发现最大的危机和挑战，一旦它们在中短期时间内发生，则必须把它当作头等大事来处理。

所谓致毁知识是：制造毁灭性武器等导致毁灭性灾难的各种产品或方案的核心原理、核心技术等核心知识。如导致原子弹发明的核裂变知识和链式反应知识，制造核武器的图纸，用于研制基因武器的DNA重组技术，生化武器的配方。所谓毁灭性灾难即大规模毁灭人类生命、大规模毁灭人类生存秩序或人类生存环境的灾难，包括国际上所说的大规模杀伤性武器造成的灾难。致毁知识有“规模性”、“核心性”、“非常规性”三个特点需要强调，以免与致死知识和其他非致毁知识混淆，以免致毁知识泛化并因此使这个新概念失去意义。此外，本书还论述了提出致毁知识概念的五项理由。

对致毁知识的研究具有“简化”、“等效”、“转换”、“结合”、“替代”等五个特点：(1) “简化”，突破“净效应”框架，把“致毁知识”作为一个独立的因素加以研究，实现从“双刃剑”模式到“致毁知识”模式的转变，

突破研究科技负面效应的瓶颈；指出致毁知识的巨大威力和极端危害性使其正负效应不能抵消，攻击与防护不对称和控制与被控制的不对称决定了防护总是无法抵消攻击的效果，防护知识和控制知识的增长无济于事；在强力的科技效应中，净效应概念无效，负效应程度决定人类安危、决定现行科技能走多远、能发展到何种水平。因此，可将致毁知识视为一个独立的因素加以界定和研究。而普通的“负知识”、“有害知识”则不能作为单独的因素加以研究，因为其正负效应存在可以相互抵消的情况，所以如果不综合考虑“净效应”，就不能得出任何明确的结论，而净效应研究极其复杂。研究致毁知识则可不考虑“净效应”问题。区分普通的“负知识”与“致毁知识”是一个关键，“双刃剑”模式就忽视了这一差异，实际上科技的威力大到一定程度，就变成了毁灭人类的“单刃斧”。当然，在较弱负面效应的范围内，“双刃剑”模式仍适用。（2）“等效”，把“致毁知识”的出现、积累与发生毁灭性灾难等同起来（只是在时间上滞后一些）。“原理—产品连锁关系和效应”、“科研成果与应用的连锁关系与效应”使得致毁知识一旦产生，即出现了原理上的突破，则相应的致毁武器等产品迟早也会出现。即致毁知识的出现可以等同于致毁武器等产品的出现（只是滞后一些）。不用说，致毁武器等产品一出现，就会有人或机器有意、无意地利用它为非作歹或发生过失，造成毁灭性灾难。即致毁知识的增长、积累和扩散到一定程度，就可以等同于毁灭性灾难的发生（只是滞后一些），这种等效又使研究变得相对容易。（3）“转换”，把对科技负面效应的泛泛的研究，转换为对其核心问题——致毁知识的出现、增长、传播、应用和禁止的研究。也就是说，把纷繁复杂的科技负面效应的问题转换为相对简单的致毁知识增长问题的研究。（4）“结合”，采取对致毁知识研究和对科技知识（内含致毁知识）的研究相结合的方式，一般化的研究是指对包括致毁知识在内的科技知识的出现、增长、传播、应用和禁止进行研究，并讨论这一研究的结论是否也适用于致毁知识。（5）“替代”，进入现代社会以来，在世界范围内，人类没有真正实行过禁止或放慢科技发展的实践活动，要想回答能否禁止或放慢科技发展的问題，就不可能进行直接的实证研究，故采取替代研究的方式，即对可能的禁止或相当于禁止科技发展的机制进行考察和分析，就像即使没有实际进行过制动刹车，但可以通过对刹车机制（制动系统）的分析，照样能回答刹车是否失灵的问题。基于这些特点，实现了关于科技负面效应研究的突破和大幅度推进，得出一系列明确的重要结论。

本书在识别最大危机方面有七项主要结论：

(1) 必须有选择地创造知识，对科学和认识设置适当的“禁区”，尤其是要禁止致毁知识的增长，因为当致毁知识增长、积累到一定程度必然会发生毁灭性灾难。

(2) 致毁知识增长是不可逆的，你可以销毁大规模毁灭性武器，但不能销毁制造大规模毁灭性武器的知识；在市场经济这一世界主流社会发展模式下，致毁知识的增长又是不可阻止的。不能阻止致毁知识增长的原因有二十四条。其中包括在现行的观念和制度下，科学家做出新发现、新突破获得的收益远远大于付出的代价。如果顾忌可能的危害而停止研究，社会并不能从你的放弃中受益，因为别人仍然继续研究并赢得优先权，因而不停止研究是明智的。不可预知性、眼前利益优先、竞争压力、外部性、缺乏统一法规和奖惩极不对称等因素使科研成果的出现不可禁止，连锁关系和连锁效应使得凡是可能应用的科研成果都会被尝试各种应用；无法全面权衡科技知识增长的利弊，无法决定利大于弊时继续增长，反之则放慢或停止增长；科研活动遵从制度化的眼前利益优先原则，极力争夺优先权、专利权等知识产权和研究经费等眼前利益，否则就会被淘汰出局；禁区悖论说明来得及禁止时却不能识别和确定是否需要禁止，预备条件出现后能够确定时又禁止不住了，把禁区范围扩大能阻止致毁知识的产生，但不可行，禁区范围窄小又禁止不住；现行科学缺乏必要的自我纠错机制和自我保护机制，也无法阻止致毁知识的增长和应用；科技发展是企业 and 市场经济的生命线，知识的继承性、互联性和整体性使得致毁知识很难从其母体科技知识中剥离开来，即在科技知识增长的同时不可能阻止其中的致毁知识出现、增长、传播和应用，致毁知识将随着科技知识的增长而增长。市场经济、科研活动乃至整个社会的制度化的眼前利益优先、丛林法则至上的原则、结构、激励机制和胜出机制是不能阻止致毁知识出现、增长、传播、应用的根本原因，而且不仅如此，它们还高度依赖和加速包括致毁知识在内的科技知识的增长。致毁知识不可逆增长问题更突显了眼前利益优先与丛林法则至上社会的根本缺陷，也为终结这种社会，发生社会转型提供了契机。

(3) 不能阻止致毁知识增长意味着人类面临毁灭的危险是不断累加的，达到一定程度必然会发生毁灭性灾难。鉴于目前科技发展势头强劲，新发现、新技术不断涌现，种种迹象表明新一轮科技革命即将（或者已经）爆发。如不采取断然有力的措施，在中短期（5年至20年）内爆发危机的可能性极大，而且这种不可逆增长的危险累进方式，使得毁灭性灾难发生的几率越来越大，直到爆发。如果再考虑到人们在认识和应对科技负面效应的问题上存在的种

种误区,就更令人对目前人类所处的凶险境遇而担忧了。

(4) 只有在科技、经济和社会领域进行一系列深刻的变革,才可能从根本上遏制致毁知识的不可逆增长。

(5) 首次揭示出科技知识不可逆增长对人类生死攸关的深刻含义。在此之前,学者还很少注意到科技知识增长的不可逆性,那些发现了科技知识具有不可逆增长特点的学者,似乎也没有意识到其中蕴含的至关重要的意义。

(6) 指出目前可持续发展理论的重大缺陷,即人类目前面临的最大危机和挑战是直接威胁人类群体生命安全的致毁性科技负面效应,它是比环境破坏、资源消耗更大的危机和挑战,这应该是可持续发展概念和理论中最重要的——然而至今仍欠缺的——核心内容。

(7) 首次较系统地就科技负面效应不可遏制的角度揭示出当前以美国为代表的、在世界上占主导地位的科技发展模式与经济、社会发展模式都不是可持续发展的模式,因为它们缺乏必要的自我纠错和自我保护机制,无法克服内生的矛盾:既高度依赖科技的发展与应用,又无法克服和无力承受由此带来的不可避免的、日益严重的致毁性负面效应。这将导致美国模式的崩溃或终结。

智业革命(科技转型、产业转型、社会转型):最大危机的化解之道

本书讨论的核心问题是人类面临的重大危机和挑战及其解决之道。以上介绍的对最大危机的发现、判断和论证,是本书第七章、第八章、第九章的内容,下面介绍探索危机的解决之道,这是更困难的问题。仅设置科学技术禁区无济于事,只影响他人的观念和思想也不足以克服危机,关键是如何引起行动、如何引起足以使科技、产业和社会发生转型的行动。其难度之大是可以想象的,但是不如此就不能够解决危机。虽然发现问题很重要,但是对于社会科学领域来说,解决问题更重要也更困难。本书的篇章结构也能反映出这一特点:发现和论证人类面临的重大危机仅用三章的篇幅,而探索解决方案则用了大约十五章篇幅。本书给出的五项预言不是常见的锦上添花式的“趋势外推”(早一些知道社会发展趋势能够更好地适应未来),而是改弦易辙和另辟蹊径。可从不同角度观察这一巨变的意义:(1)从社会核心法则变革的角度看,致毁知识不可逆增长问题更突显了眼前利益优先与丛林法则至上的社会的根本缺陷,也为终结这种社会,为发生以社会核心法则变革为特征的社会转型提供了契机,这是人类有史以来第一次大转型。(2)从社会结构变迁的角度看,则万年以来发生过两组大事:一是农业革命、国家的建立

和官权等级社会的出现，二是工业革命、市场经济的建立和钱权商业社会的出现。现在将被迫发生第三组大事：智业革命、科学社会化和智权知识社会的创建。智业革命包括科技转型、产业转型和社会转型。(3) 从社会主流模式更迭的角度看，当今世界的主流社会模式——美国模式——必然行将崩溃或终结。环境资源和国际政治等问题不能让美国模式崩溃，至少在可预期的时限内不能，而致毁知识不可逆增长却必定能摧毁或终结美国模式。这给后来者居上提供了机会，率先创造出新的可持续发展模式的国家，可能成为 21 世纪的领跑者，成为新的世界主流模式的创造者。(4) 从科学革命的角度看，将发生科学重心转移，社会科学崛起。科学将从作为致富工具的财富型科学转型为作为社会智能系统的头脑型科学。(5) 从产业革命的角度看，创意产业取代高技术产业成为主导产业，实现产业转型。

为更好地探索最大危机的解决之道，本书提出集团/平台适配系统理论、平台阶升式科学发展模式与平台转换的科学革命观、头脑型科学公平和谐五项基本原则、全程安全的科学技术等，并应用它们对社会和科技的发展进行全程研究，对即将发生的一系列变革进行解释、预测、勾画和引导。电子学务和英才家园计划的提出更是尝试着为智业革命准备启动方案和切入点。

如果读者认同或基本认同笔者对人类面临的最大危机的判断，那么，接下来的阅读也许是激动人心的：因为在对危机解决之道的讨论中，蕴含着一系列巨大的学术机会、商业机会和政治机会。小的机会可以创造，大的机会则只有等待，天赐良机之时，您准备好了吗？

Introduction

This book consists of the following five parts: Theories (theories of social development and scientific revolution), History (two series of great events during the last ten millennia), Challenge (the most serious crisis and challenge facing humankind), Transition (scientific and technological transition, industrial transition, social transition), and Initiation (initiation scheme for the Intelligence Industry Revolution). The core issues discussed in this book are the most serious crisis and challenge confronting humankind and the solution to them. The core functions of human brain include the perception of crisis, the capture of opportunity, utilization of benefits and evasion of dangers, and the realization of objectives. Acting as the intelligent system of the society, intellectuals should consciously shoulder the responsibility as pathfinders and decision-makers for the navigation of the social progress. This is determined by the fact that both the identification of problems and the findings of solutions to the problems rely on professional knowledge to a great extent. The identification and confirmation of the most serious crisis and challenge is the premise for the determination and planning for the future development courses, and is the key factor that affects or even determines the direction of development. Once the most serious crisis and challenge are allowed to grow to such a magnitude that devastating catastrophes may ensue in the near or intermediate future, the seeking of solution to the problems becomes the top priority for the entire human race. So far, there have been various scenarios proposed about the crises humankind is facing today, such as the issues concerning environmental resources, population explosion, globalization, weapons of mass destruction, terrorism, uncontrolled scientific and technological development, AIDS, crisis in beliefs and ethics, the gap between the rich and the poor, impact from extraterrestrial celestial bodies, which have been deemed as the most serious, or at least one of the most serious, crises. Then, in the near or

intermediate future, is it true that there exist crises powerful enough to incur devastating catastrophes? Can these crises be resolved immediately after being identified? These are the questions that can no longer be dodged.

I have proposed and applied the concept of “Ruin-causing Knowledge” in the first attempt in the world to take it as the cut-in point and subject of research (Liu, 1999, 2000, 2002). With this attempt, the original studies on the adverse effects of science and technology can be transformed into the studies on the core issue on this matter—the emergence, growth, dissemination, application and prohibition of Ruin-causing Knowledge. Also, the long practice of considering the adverse effects of science and technology as part of a “Double-edged Sword” can be replaced with the mode of “Ruin-causing Knowledge” for a systematic research of the relationship between the growth of Ruin-causing Knowledge and science and technology, economy, and human society, as well as the scheme for suppressing the adverse effects. Based on this shift of research perspectives, a series of new discoveries, predictions, innovations and explorations can be made. The major findings of my research can be summarized as follows: the growth of Ruin-causing Knowledge is irreversible, and with the market-oriented economy as the mainstream mode of social development in today’s world, the growth of Ruin-causing Knowledge is also unstoppable. The expansion of science and technology has proved to be out of control, which means that the risk of total human annihilation is on the rise and accumulation until it brings about devastating catastrophes when it reaches a certain magnitude. Considering the rate and trend of current development of science and technology, we can already feel the ill omen looming ahead. This is the most serious crisis and biggest challenge facing humankind. Therefore I am able to make five predictions: (1) the American mode will collapse. The American mode shows over-reliance on the growth of scientific and technologic knowledge. As the headquarters, distribution center and origin of growth for Ruin-causing Knowledge, this mode is the first to be threatened by devastating catastrophes, and thereby can no longer sustain its development. (2) The core rules of giving priority to immediate benefits and following the “jungle principle” shall be terminated. These two core rules, which have been dominating the social operation, benefit distribution, and international order, must make their retreat to a secondary position and cease to function as the core rules. (3) The focus of science shall be shifted, and social sciences shall rise. Science will be transformed from the Wealth-pursuing type, used as Fortune-seeking device,

into Mind-typed Science, used as the social intelligent system. (4) The creative industry will take the place of Hi-tech Industry as the predominant industry, realizing the process of industrial transition. (5) The binary society based on "Government-Market" (Bureaucratic power—Money power) shall evolve into a trident-shaped social paradigm consisting of "Government-Market-Academic Community" (Bureaucratic power—Money power—Intelligence power). Thus a Mind-power-based knowledge society can be formed. These three major transitions can form the Intelligence Industry Revolution. The main innovations in this book can be reflected in the following proposals: the theory concerning the group/platform adaptation system, Terrace-exaltation mode of scientific development and the outlook of scientific revolution based on the transition of platform, Mind-type Science five basic principles for fairness and harmony, all-way secure science and technology, Park-type Research Institutes, Park-type Universities, programmable academic evaluation method, novelty inquiry analysis, objective and efficient identification method for finding knowledge professionals. The main explorations can be found in the initial establishment of E-Academy as a new domain of academic pursuit, which takes the winning mechanism reform as its core, takes the establishment of system of giving priority to academic endeavors, the basic reference system and deeply application of information technology as its characteristics, takes the integration of E-Academy and creative industry as the main source of power, and takes the powerful repression of repetitive researches and the ruthless check on academic corruption as the break-through channels. The purpose of establishing E-Academy is to use it as the initiation scheme for the Intelligence Industry Revolution.

The Irreversible and Unstoppable Growth of Ruin-causing Knowledge is the Most Serious Crisis and Challenge Confronting Humankind

If we take the degree of imminence of the threatening crisis and challenge as the criterion of ranking, we can identify the number-one crisis and challenge. The top of the list should be of two properties: first, the crisis and challenge should be extremely detrimental to bring about devastating catastrophes; second, they can cause immense difficulty in human efforts made to solve them. More often than not, even if the crisis or challenge can be discovered, under the current circumstances, humankind can do nothing to overcome them. The crisis cannot be resolved until a rather long period of time has elapsed. The former property indicates the degree of hazard of the crisis, while the latter sketches the difficulty of solution. Since the

crisis cannot be resolved immediately, this can further magnify the actual threat and harm of the crisis. These two factors together can determine the degree of hazard posed by the crisis and challenge to human survival. Therefore, the most serious crisis and challenge must be identified as early as possible. As soon as they occur in the short and intermediate term, we must treat them as the first priorities. By means of in-depth probe into the adverse effects of science and technology, this book explains the process of how to confirm the biggest challenge facing humankind, and offers recommendations that can be used to solve the problems.

I have proposed and utilized the concept of "Ruin-causing Knowledge", and treated it as the subject of research on the adverse effects of science and technology. This is my definition of "Ruin-Causing Knowledge" (RCK): the core principles, core technology and other core knowledge used to produce various products and schemes that can be used to cause devastating catastrophes, such as Weapons of Mass Destruction. Examples of "Ruin-causing Knowledge" include nuclear fission knowledge and chain-reaction knowledge used in the invention of atomic bombs, drawings used in making nuclear weaponry, Recombinant DNA technology used in developing genetic weaponry, formula used in waging biochemical warfare, etc. The so-called devastating catastrophe refers to the disasters that are capable of annihilating human lives, human survival order or human survival environment on a massive scale, including the disasters caused by Weapons of Mass Destruction recognized by the international community. Ruin-causing Knowledge shows the traits of "scale operation", "core concentration" and "unconventional deployment", which should be emphasized to distinguish it from lethal knowledge and other Non-ruin-causing Knowledge. We should avoid the practice of blurring the boundary of Ruin-causing Knowledge, since it will compromise the significance of this new concept. In addition, this book also contains the discussion of five reasons why Ruin-causing Knowledge should be proposed and why Ruin-causing Knowledge should be distinguished from Non-ruin-causing Knowledge.

The studies on Ruin-causing Knowledge show five characteristics: "simplicity", "equivalence", "conversion", "combination", and "substitution". (1) The characteristic of "simplicity" breaks away from the framework based on "net effect", and treats "Ruin-causing Knowledge" as an independent factor for research; hence it can realize the shift from the mode of "Double-edged Sword" to the mode of "Ruin-

causing Knowledge” and break the bottleneck in the study on adverse effects of science and technology. Pointing out the overpowering strength of Ruin-causing Knowledge and its extreme hazard makes it impossible for the positive and negative effects to offset each other. The dissymmetry between offense and defense, and the imbalance between controlling and being controlled, have determined the fact that the defensive measures always fail to compensate for the offensive effects. Thus the development of protective knowledge and control-related knowledge does not solve the problem. In the face of overwhelming scientific and technological effects, the concept of net effect is of no avail, and the adverse affect will determine the security level of humankind and determine how far the current science and technology can go, and how high it can reach. Therefore, it is legitimate to treat Ruin-causing Knowledge as an independent factor for definition and research. In contrast, the ordinary concepts of “negative knowledge” and “detrimental knowledge” shall not be treated as independent factors for research, because of the circumstances in which their positive and negative effects can be offset. As a result, if “net effect” is not taken into accounts in a comprehensive manner, no well-defined conclusion can be achieved. The research on the net effect is very complex. The distinction between the ordinary “negative knowledge” and “Ruin-causing Knowledge” is the key to the problem, while the mode of “Double-edged Sword” overlooks the necessity of this differentiation. In fact, when the power of science and technology reaches certain magnitude, they will become a “Single-edged Ax” which can be used to annihilate humankind. (Of course, the mode of “Double-edged Sword” is still available in certain range) The study on Ruin-causing Knowledge can render the issue of “net effect” dismissible, hence simplify the research process. (2) “Equivalence” means that the occurrence and accumulation of “Ruin-causing Knowledge” can be tantamount to the occurrence of devastating catastrophes (although the latter may lag behind a little bit). “The chain-reaction relation and effect between principle and product” and “the chain-reaction relation and effect between scientific and technological accomplishments and their applications” can materialize such a scenario in which once the Ruin-causing Knowledge comes into being, namely breakthrough in principles can be achieved, corresponding Ruin-causing Weapons can be developed sooner or later. This means that the appearance of Ruin-causing Knowledge can be viewed as the appearance of Ruin-causing Weapons (although the latter may happen a little later). Needless to say, once Ruin-causing Weapon appears, it can be taken advantage of by human beings or machines deliberately or unconsciously in

committing evil deeds or causing mistakes and devastating catastrophes. That is to say, once the growth, accumulation and proliferation of Ruin-causing Knowledge reach a certain extent, it can be tantamount to the occurrence of devastating catastrophes (though after a certain interval elapses). The characteristic of equivalence can make the research easier to conduct. (3) "Conversion" means that the generalized research on the adverse effect of science and technology can be transformed to the studies on its core issues: the appearance, growth, dissemination, application and prohibition of Ruin-causing Knowledge. In other words, the complex and intricate issue of adverse effect of science and technology can be transformed into the study on the relatively easier issue concerning the growth of Ruin-causing Knowledge. (4) "Combination" means the integration of the study on Ruin-causing Knowledge into the study on scientific and technological knowledge (including Ruin-causing Knowledge). Research in the usual sense means the study on the appearance, growth, dissemination, application and prohibition of scientific and technological knowledge (including Ruin-causing Knowledge) and the discussion of whether the conclusion obtained through the research can be applied to Ruin-causing Knowledge. (5) "Substitution". Since the human society entered the age of modernity, in a world-wide range, humankind has never implemented any practical measures to prohibit or slow down the development of science and technology. If we aim to respond to the question of whether the development of science and technology can be prohibited or slowed down, no direct empirical studies can be made, so we choose the alternative method of "substitution". That is to say, we investigate and analyze the mechanism which may be used to prohibit the development of science and technology or exert similar functions. An analogy can be made here, by referring to the testing of braking system of vehicle without really stopping the vehicle, yet the result can still be convincing after analysis is made for the braking system to detect the problems with the brake. Based on these characteristics, breakthrough and significant progress in the study on adverse effect of science and technology can be realized, and a series of definite conclusions can be drawn.

The conclusion of the book mainly includes seven aspects in which the most serious crisis can be identified.

(1) There should be a forbidden area for both science and cognition. When humankind discover what they do not deserve to know, total annihilation will

follow. We must create knowledge in a selective way, especially by prohibiting the growth of Ruin-causing Knowledge. Devastating catastrophes are bound to happen when the growth and accumulation of Ruin-causing Knowledge reach a certain level.

(2) The growth of Ruin-causing Knowledge is irreversible. Weapons of mass destruction can be destroyed, yet the knowledge used to produce them cannot be destroyed. With the dominant mode of social development based on market economy, the further growth of Ruin-causing Knowledge cannot be stopped. With systematic analysis, I have concluded twenty-four causes to explain why the growth of Ruin-causing Knowledge is unstoppable. Among these causes, with the current concept and system of making discoveries and achieving breakthroughs, scientists can always get greater benefits than the costs they have to pay. Although they may terminate their researches for the sake of potential dangers, the society can never benefit from the meaningless sacrifice, because other people may continue the research and win the priority. As a result, it is wise not to stop the research. Unpredictability, priority to short-sighted benefits, competitive pressure, externalities, lack of unified laws and rules, asymmetry between awards and penalties, all these factors make it impossible to prohibit the emergence of scientific and technological accomplishments. The chain-reaction relation and effect means that each and every possible application of scientific and technological accomplishments can be tried to actualize. It is hence impossible to comprehensively weigh the advantages and disadvantages of the growth of scientific and technological knowledge, to decide whether the advantages outweigh the disadvantages so that the growth should be continued, or vice versa. The activities of scientific research follow the systematic principle of giving priority to immediate benefits, so they strive to get intellectual property rights, such as priority and patent rights, and other immediate interests, such as research funds. Otherwise, the players in the research will be out. The paradox of forbidden area explains that when prohibition measures can be taken in time, it is impossible to identify and define the problems to be prohibited. When the preconditions are really available and confirmed, the prohibition is no longer effective. The extension of forbidden area can prevent the emergence of Ruin-causing Knowledge, yet it is not feasible. If the forbidden area is too narrow, the prohibition will be in vain. The current system of science lacks necessary self-correction mechanism and self-protection mechanism, which also makes it impossible to stop the growth and application of

Ruin-causing Knowledge. The development of science and technology is the life-line of enterprises and market-oriented economy. The inheritance, interrelation and integration nature of knowledge makes it hard for Ruin-causing Knowledge to be torn away from its host—scientific and technological knowledge. This means that during the growth of scientific and technological knowledge, it is impossible to prevent the appearance, growth, dissemination and application of Ruin-causing Knowledge, which will grow along with the growth of scientific and technological knowledge. Market-oriented economy, scientific researches, even the entire social system of giving priority to immediate benefits, and the principle, structure, incentive system and winning system of “Rules of the Jungle” are the fundamental reasons why the appearance, growth, dissemination and application of Ruin-causing Knowledge cannot be stopped. The unstoppable tendency is worsened by the fact that it will highly rely on and accelerate the growth of scientific and technological knowledge, including Ruin-causing Knowledge. The issue of the irreversible growth of Ruin-causing Knowledge further highlighted the fundamental deficiency of the practice of giving priority to immediate benefits and following the social norm based on “Rules of the Jungle”. However, the issue also provides an opportunity to terminate this social structure and trigger social transition.

(3) Being unable to stop the growth of Ruin-causing Knowledge means that the danger of total annihilation of humankind is ever increasing. When the danger reaches a certain level, devastating catastrophes will ensue. In response to the vigorous development of science and technology with surging new discoveries and new technology, there are very signs to indicate the imminence of a new round of scientific and technological revolution, which might have happened in one way or another. It is clear that the vicious omen is hanging overhead like the Sword of Damocles. This is the most serious crisis and challenge facing the humankind. If no decisive and powerful counter-measures are taken, in the short term or intermediate term (in 5 to 20 years), there will be a great possibility for the crisis to break out, and the accumulating of danger by increments as a result of the irreversible growth can increase the probability of the occurrence of devastating catastrophes until the ultimate outbreak. If we take into consideration the various mistakes in the awareness of and reaction to the adverse effects of science and technology, we will be more agonized by the treacherous situation endangering the very survival of humankind.