

社科论集

管理、创新与商战

■ 许康 著

■ 甘肃文化出版社

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# 给交叉科学工作者以适度空间

(代 序)

改革开放以来,我们逐渐地认识到交叉科学在社会经济发展中的重要性。高校交叉学科研究并不是从现在才开始的。一些老一辈科学大师如钱三强,以“总算找到家门了”来形容自己后半生基本上从事的是“科学学”的实践;华罗庚的“双法”(优选法、统筹法)是经济数学和管理数学的交叉;钱学森“两弹一星”总体设计部的活动,已经从他的空气动力学领域经过《工程控制论》到达了系统工程学科,至于他对科学学、科技哲学、工业设计(设计艺术学)甚至“山水城市”(城市规划的具体见解)等等领域发表的意见,无不反映其跨学科的研究兴趣;冯康,由于其工程、物理学、数学几方面的深厚功底,得以在计算数学和计算机技术领域作出了如有限元方法这样开创性的贡献……

毫无疑问,他们的成功,在相当程度上得益于其读书阶段(学校教育,以及自学)的通才教育(包括自我修养)方式,即多学科熏陶和自己的融会贯通,这是“外铄”和“内熔”双管齐下的产物,不过,这还只是潜在的能力;这些隐性知识的外化,还要借助一定的表现形式,经过一定的实践来体现,这就是在相应的若干学科的交叉地带耕耘开拓、研究探索,乃至实现知识和学科的创新。

而我国高等教育自1952年高校院系调整以后,文理工法商兼备的综合性大学基本上消失了,取而代之的是大批的从属于各部委的专业化院校,这些院校的专业设置多限于该学校所在的学科大类,是纯种的学科,其发展也是近亲繁殖,没有杂交,这种院校和专业的调整,使得教师和学生的知识狭窄,在这种教育环境中很难说能培养出高水平的通才,更不用说如前所举的大师了。即便是学术水平毋庸置疑的两院院士们,年龄在70岁以下者(即院系调整后进入高校校门的),达到上述大师那样跨学科的通才也是凤毛麟角。

有一种说法,当今自然科学学科种类总计约近万种;另一种统计(到20世纪80年代),“在中观层次上已发展成约为5500门学科,其中非交叉学科约为2969门,而交叉科学学科总量已达2581门,占全部学科总数的46.58%”。而我们的高等学校,按1997年颁布的《授予博士、硕士学位和培养研究生的学科、专业目录》,一级学科由原来的72个增加到88个,二级学科(学科、专业)由原来的654种减少到381种,也就是说,大约只占现有“中观层次”学科总数的1/14,其中交叉学科的比例更小。

“法定”二级学科种类的减少,原意是拓宽口径,有利于学科之间的交流和融合。殊不知,这一政策导向得到了错误的理解和执行。因为按学科发展的长远规律虽是合久必分、

分久必合,合中有分、分中有合,但当前的趋势仍然是以分为主,它的综合和统一并非依人们的主观愿望为转移。以数学为例,百年前的希尔伯特就追求统一,布尔巴基学派试图以“结构”来实现统一,后来还有用“范畴”、“函子”等来统一的设想,都没有成功。一门学科内部尚且合不了,遑论几门学科的综合和统一?诚然,学科间的交叉,正是为将来的融合作准备,但现实的表现形式却是种类越来越多。人为的规定,没有反映这一趋势,却发布了含糊的信息,使人们从字面上看到的大多数学科名称都是传统的正规门类,它们本来就泾渭分明,这样予以颁布,无异宣示没有交叉学科容身之地。且不说各学科专家怎么看,至少各级教育行政部门都得以此为根据。

大体说来,学科距离近的交叉比较容易为各该领域的几方专家所认可,如物理化学、化学物理;以某一方为工具或方法的交叉如经济数学、计量经济学、数理经济学、计算物理学等等,也为人们所承认;而交叉跨度大的学科,如一般的自然科学、社会科学、人文学科之间的双向或多元或多维多层次的交叉,在原来的各该领域,可能哪一边也不讨好,甚至遭到各方的拒斥。从事这样的交叉研究,真象马克思所说的如同站在地狱的入口处,必须承担巨大的风险。首先,是学科不合“法”,即没有列入权威部门的“目录”,不被“国家标准”所承认,没有单独申请博士、硕士学位授予权的资格,甚至也没有招收大学生的权利,这样,学校领导和有关部门不会为这种学科的发展提供支持。其次,是评定学术职称,常被几方学科评审组踢皮球,甚至遭到不少评委以“我们不懂”的口实加以拒绝。在申请科研项目时,也因没有相应的学科组而遇到麻烦。在投寄论文时,编辑部门也常以找不到合适的审稿人或稿件与该刊学科范围不切合而拒登。在申报奖励时也同样如此。更严重的是岗位问题,在压缩编制、精简人员的形势下,被视

为左道旁门的交叉学科工作者首当其冲可能被打入“另册”。即使你有符合所在教研室专业方向的一技之长而无须靠交叉学科“吃饭”，也难以得到同仁的谅解，因为他们还有一个担心：你的研究成果大部分属于交叉学科，将来上级业务部门在评估该教研室或该系的专业资格和学术地位时，这些成果都“不作数”、“不占重量”，还是拖了后腿，甚至“起反作用”。

交叉学科成了“另类”，交叉学科工作者成了“异数”，这是近年不少高校存在的现实情况，在相当大程度上可说是“拜”上述规章所“赐”。于是我们陷入了这样的逻辑链的缠绕：专业过多 - 难育通才 - 减少专业 - 缺乏交叉 - 更难打通。

这里问题的症结在于：把专业划分的“多”和“窄”混为一谈了；把学科门类的（人为）减少与学科口径的（自然）扩张混为一谈了。

事实上，如前所述，交叉学科的增“多”，并非专业变“窄”，而是扩张的结果；将交叉学科名称从“目录”中抹去，只认传统的划分，并不能使人们自然地理解其中有对交叉学科的默认，何况处于边缘地带已经相对独立出来的若干交叉学科，现在更加“不入流”，处于传统学科核心和主流地位的人们何必对它们自作多情呢！于是出现了上述的两难境地。

当前我们国家对知识创新给予前所未有的重视，而学科交叉往往是产生新概念、新定律、新理论、新科学问题、新技术手段的新学科的生长点，中国科学院在知识创新工程中正在大力发展交叉科学，包括增强了8个重大交叉科学前沿的发展。国家自然科学基金委员会在扶持交叉学科研究上也屡出新招，如它的管理科学部“项目指南”，对管理学科的划分就比教育部的“专业目录”细致得多，此外还提倡跨学部的项目申报。

看来，高等院校在专业设置上不要作法自毙了。今年

“学科专业目录”正在重新研究调整,尽管不可能大大增加交叉学科的设置,似可双管齐下,在每个大学科门类下均添设一“交叉学科”分支,另外在各大门类之外再设一“跨学科”大类。这是在立法上明确认定交叉学科的地位,在执法上还可附注若干指导性文字,或另附实施细则。在“十五”学科发展战略布局中,也应强调交叉学科的地位。在具体的科研项目、课题中,在评奖、评定职称中,均应单独设立交叉学科的申报口子,有别于既有学科的现成套路。最重要的是提倡观念的更新,促进学术上兼容并包的风气,允许探索,宽容失败,加强激励。对于大学来说,开设多种交叉学科选修课程,给予一定的岗位和编制,使得交叉学科教师有适度的生存和发展空间,当然是基本的保证。

(许 康)

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*CHINA HIGHER EDUCATION*



## **Necessity of Adequate Development Opportunities for Cross – disciplinary Researchers (As a Preface)**

XU Kang (Hunan University)

The paper holds that education in China attaches too early and excessive importance to specialized education and ignores general education, which is not beneficial to the development of innovative and versatile talents. The paper appeals to the education administrative departments to offer appropriate positions for cross – disciplinary researchers and give them equal treatment in teaching, research and professional title application.

## **I Management**

### **I – 1**

#### **The Pursuit of Management Scientification in Ancient China**

——An Exploration and Argumentation from Chinese Mathematical Classics

XU Kang(Hunan University)

On the basis of the author's serial theses, the author continues in this paper the exploration of materials of management scientification (mathematical modeling) in Chinese mathematical classics of Song, Yuan, Ming and Qing dynasties. The paper reveals the advancement of management thoughts of the ancient world and its enlightenment to modern management.

## I -2

**Preface to *Master Sun's Mathematical Manual*,  
a Book of Ancient Chinese Mathematics for Management**

XU Kang (Hunan University)

LAO Hansheng

(University of Electronic Science and Technology of China)

*The preface to Master Sun's Mathematical Manual* was rarely studied by Chinese mathematics historians. The paper found some new information from the preface: first of all, *The Preface to Master Sun's Mathematical Manual* was ingenious among books on Chinese mathematics; secondly, the viewpoint of nature and the world outlook in *The Preface to Master Sun's Mathematical Manual* were conspicuous; thirdly, *The Preface to Master Sun's Mathematical Manual* rebelled against orthodoxy in many respects with Confucian classics study and metaphysics; fourthly, the educational thought in the *Preface to Master Sun's Mathematical Manual* set people thinking; fifthly, the stylistic features of *Preface to Master Sun's Mathematical Manual* were of both unsophisticatedness and antithesis; sixthly, *Preface to Master Sun's Mathematical Manual* was probably finished in the 3rd century.

## I -3

**A Textual Research from the Official Robes in Ming Dynasty  
of the Genuineness of Some of the Portraits of Xu Guangqi**

XU Kang (Hunan University)

LUO Daxiong (Zhuzhou No. 2 Middle School)

The full-length statue of Xu Guangqi (Picture 1) housed now in Shanghai Museum is a relic in Xu's former residence in Shanghai and it is authenticated as a work of art in Ming Dynasty. The statue portrays Xu Guangqi's late years and its skill is excellent, with vivid facial portrait and perfect combination of light with shade. Xu is dressed in usual clothes, i. e. a bright red robe with white round collar and an embroidered white-crane *Bu Zi* on the chest (during the period of the Ming Dynasty, all the officers and officials dressed themselves in costumes with *Bu Zi* on their chests and backs to show their ranks in imperial court), a jade belt, black court boots with white edge and wolf-skin seat. This is in compliance with the costume and personal adornment of civil officials of first rank regulated in "Collected Statutes of the Ming Dynasty" (History of the Administrative Statutes of the Ming Dynasty). Therefore, this picture is true. In the other 3 pictures (Pictures 3, 5 and 6), Xu is dressed in formal robes granted by the Emperor. But the caps are something like the black gauze cap, the top of which is a little bit flat. The headgears in Pictures 3 and 5 are like those of the ceremonial clothes, which were specialty for *jinshi* (people who passed metropolitan imperial examination). Thus the caps does not go with the clothes. Neither does the cap in picture 6 go with the clothes. So we wonder whether they are true or not. Another reason is that those 3 pictures succeeded in painting Xu's face and absorbed the western painting skill. They should be the works in late Qing Dynasty. Picture 2, a group picture of Xu Guangqi and Matteo Ricci, is stored in Bettmann Archives. From the unskilled Chinese characters in the background we know the painter

is a westerner. The figure of Matteo Ricci is modeled according to the portrait by Emanuele Pereira in 1610, while the figure of Xu could be modeled in the same way. Another group picture (Picture 4) is modeled on Picture 2. There are skillful Chinese characters in the background. It is painted by Shanghai Catholic Church.

Therefore, among these portraits, only Picture 1 and Picture 2 are consistent with the historical facts.

#### I - 4

### **An Archives - Based Study on Management of Mathematical Research and Talents Development in Late Qing Dynasty and Republican China**

XU Kang, MO Zaishu

Hunan University

The paper introduces the historical materials the authors have collected from the scattered archives in recent years. These materials include the catalogue of the collected mathematical books in *Yixue Guan* (College of Interpreters which was incorporated into Peking University in 1898) of *Xuebu* (Ministry of Education) in late Qing Dynasty, fragmentary documents from "Institute of Education" of *Xuebu*, the directory of research projects sponsored by Ministry of Education of the Republican government (1912 - 1949) for mathematical teachers in universities, and the records of how Zhou Shaolian (1905 - 1970), a doctoral student studying in France, was treated by Hubei Provincial Government and Provincial Department of Education as well as the Ministry of

Education in Republican era. This paper, based on these materials, discusses some improvements the governments of late Qing Dynasty and Republican China made in the management of modern mathematical development and some blunders in their management of modern mathematical talents.

I - 5

**Historical Experience of Introducing and  
Developing Management Science in Modern China**

XU Kang, SU Hengyan (Hunan University)

LAO Hansheng

(University of Electronic Science and Technology of China)

From Chinese Westernization Movement (1860s - 1890s) to May Fourth Movement (1919), modern western science and technology were introduced into China in an "inverted" order, however, "soft" science and technology such as "scientific management" and "efficiency movement" were introduced in succession into China just when the scientific spirit of May 4th Movement was at its climax, having little "time lag" with the west. The pioneers in Chinese scientific community acted as advocates of scientific management. In 1950s, the planned economy was implemented in the People's Republic of China, and the scientific community began to make research into management from the perspective of econometrics, and put forward optimization (optimal selection) method and overall planning (general programming) method with Chinese characteristics. Since the reform and opening up policy, management science has developed vigorously

with the Chinese Academy of Sciences and Chinese Academy of Engineering still being the major forces of scientific research. The discipline of management in universities develops rapidly and the financial support from the National Natural Science Foundation of China has greatly promoted the research of management science, however, the financial support from enterprises for research is insufficient. The scientific community attaches more importance to the research method of "quantitative school" at the expense of the disciplinary integration with humanities and social sciences. The status quo is the insufficient original innovation in theory and lack of adequate feasible projects in practice.

## I - 6

### **The Enlightening Significance of Education of Law and Politics in Early 20th Century**

XU Kang, ZHANG Chengwei

Hunan University

The paper, based on the study of the predecessors of department of law and politics (Hunan Officers' university - Hunan Law and Politics School - Hunan Law and Politics College, etc.) of Hunan University, especially based on the educational background of the government, makes a specific study of the professional knowledge and educational philosophy of the university presidents and the composition and proficiency of the faculties. The paper, typically with nearly 30 textbooks (*Selected Collections of Law and Politics*, compiled respectively by more than ten authors like Xia Tonghe (Hsia Tungho), a late Qing Dynasty *Zhuan*

*Yuan* -- the title for getting first place in the imperial examination), Yang Du, Hu Ziqing) as written basis, evaluates the historical position of the teaching of law and politics. The authors think that, in view of law science, politics and public administration, these disciplines introduced from the western world (via Japan) are epoch-making, disseminating thought of "constitutional government", providing codes and case laws for legal system, and offering "administration" methods. New knowledge of this kind was quite necessary and beneficial for future officials, broadening, after all, their horizons and narrowing the gap between China and the world in theory and practice of law and politics.

I - 7

**A Comment on *The Administrative Law* Compiled  
by Hsia Tungho**

WANG Baoyuan, LI Fang, LIU Yi, ZHENG Jingyang  
Hunan University

Hsia Tungho (a *Zhuang Yuan* in late Qing Dynasty -- the man who came first in the imperial examination) compiled a book *The Administrative Law* based on his notes taken in class in 1906 when he was studying in Japan, which was a miniature of introducing and absorbing western thoughts and culture in modern China and was a reflection of the patriotic Chinese exploring methods of saving the nation from subjugation. While the book was obviously copied word for word the Japanese administrative law, it, to a certain extent, played a positive role in promoting

the then school education of law and politics, the modernization of administrative law, and the development of regional autonomy movement.

I - 8

**Works on International Law in Selected  
Collections of Law and Politics**

Written by XU Pengjiang, HU Dan, Revised by WANG Zheng  
Hunan University

The American missionary William A . P. Martin translated into Chinese in 1864 *Elements of International Law* by Henry Wheaton, a renowned American international law jurist. Thereafter, the research of international law by Chinese community of law entered the phase of localization. *International Law of Peacetime* by Liao Weixun and *International Law of Wartime* by Chen Jiahui introduced western legal system and concepts to students of schools of law and politics. While there were still many limitations in their introduction, their research spirits and scientific research methods are still worth learning.

I - 9

**A Brief History of Public Administration of  
Hunan University in Modern Times**

XU Kang, SU Hengyan  
Hunan University

This paper, based on *History of Hunan University* and the



author's research in recent years of history of Chinese management science, from the perspective of modern public administration and by reference to the knowledge system of contemporary public administration, argues that Hunan University (and its predecessors) in modern times was the earliest to engage in public administration education with effective leadership, qualified faculties, novel courses and outstanding achievements, and was therefore ranked for a long period at an advanced Chinese level in public administration education. The successful experience should be inherited and carried forward as a valuable intangible asset. The paper also offers some proposals as to how Hunan University, a university with science and engineering disciplines as the main research areas, should develop public administration by utilizing the multi - disciplinary resources accumulated in the last decade.

# I - 10

## **A Review of China's Theoretical Research of Administrative Efficiency for the Last Decade**

HE Kangping, XU Kang

Hunan University

The paper, from the perspectives of the property, evaluation and promotion of the administrative efficiency, makes a preliminary systemization and summarization of the China's theoretical research of administrative efficiency in the last decade as well as relevant achievements for the purpose of enriching the theoretical research of administrative efficiency in China.