Unswerving Artisanship Amidst Prosperity: The Fruits of Dedicated Research—Meng Liansheng's Exploration and Influence in Bibliometrics and Citation Database Construction (Postprint)

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Date: 2023-04-01T16:02:53+00:00

Abstract

[Objective/Significance] This paper reviews and summarizes Mr. Meng Liansheng's contributions to theoretical and methodological research in bibliometrics, data system construction, applied practice research, international academic exchange, and talent cultivation, demonstrating his pioneering spirit and rigorous scholarly pursuit under arduous conditions.

[Method/Process] Through research methods including literature investigation and personal interviews, this study elaborates on Mr. Meng's research process, achievements, significance, and impact.

[Results/Conclusion] Mr. Meng's innovative academic explorations have promoted the development of bibliometric research and application in China while expanding the nation's international influence in this field. By leading the creation of the CSCD and DISC databases, he advanced the application of bibliometric methods in scientific literature retrieval, scientific journal evaluation, and scientific activity assessment, thereby fostering bibliometric research. These databases represent significant milestones and achievements in the development of bibliometrics in China.

Full Text

Preamble

Volume 65, Issue 15, August 2021

Not for Fame or Fortune, but for Craftsmanship: Years of Painstaking Work Bear Fruit—Meng Liansheng's Exploration and Influence in Bibliometrics and Citation Database Construction

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Abstract: *[Purpose/Significance]* This paper reviews and summarizes Professor Meng Liansheng's contributions to bibliometrics theory and methodology research, data system construction, applied practice research, international academic exchange, and talent cultivation, demonstrating his scholarly spirit of pioneering exploration and rigorous research under arduous conditions. *[Method/Process]* Using literature research and interviews, this paper elaborates on his research process, achievements, significance, and influence. *[Result/Conclusion]* His innovative academic exploration promoted the development of bibliometrics research and application in China and expanded China's international influence in this field. By leading the creation of the CSCD and DISC databases, he advanced the application of bibliometrics methods in scientific literature retrieval, scientific journal evaluation, and scientific activity evaluation, promoting bibliometrics research. These databases represent important milestones and achievements in the development of Chinese bibliometrics.

Keywords: Meng Liansheng; bibliometrics; scientometrics; Chinese Science Citation Database; Database of International Science Citation
Classification Number: G25
DOI: 10.13266/j.issn.0252-3116.2021.15.003

Bibliometrics, particularly citation analysis, employs quantitative methods to study academic communication activities and constitutes one of the core disciplines of information science. Under current demands for enhanced quantitative data support in scientific and technological intelligence, strategic research, and research management to objectively and truthfully reflect actual conditions, bibliometrics plays an increasingly important role in information science.

The development of bibliometrics requires not only continuous innovation in theoretical methods but also solid practical work for support. As one of the important promoters of Chinese bibliometrics, Mr. Meng Liansheng (hereinafter referred to as "Mr. Meng") has made outstanding contributions in theoretical and methodological research, data system construction, and applied practice research, writing a significant chapter in the history of Chinese bibliometrics.

In terms of theoretical and methodological research, his master's thesis "Chinese Scientific Citation Analysis" represents a landmark pioneering work in China, providing important theoretical foundations and empirical models for subsequent research. In data system construction, under his active promotion and direct leadership, the Chinese Science Citation Database (CSCD) was established at the Chinese Academy of Sciences Documentation and Information Center (hereinafter referred to as "the Center") in the mid-1990s, becoming highly influential in China's scientific community. In the 21st century, under his advocacy and organization, the National Science and Technology Library (NSTL) established the Database of International Science Citation (DISC). In applied research, he actively promoted the practical application of bibliometrics, advancing its role in journal evaluation, research evaluation, and talent evaluation. Additionally, he made important contributions to international academic exchange and the cultivation of bibliometrics talent in China.

This paper reviews Mr. Meng's research journey in bibliometrics theory and methodology, data system construction, applied practice research, international academic exchange, and talent cultivation, summarizing his achievements. We hope to present and carry forward the pioneering, progressive spirit and rigorous scholarship of the older generation of library and information scholars represented by Mr. Meng, inspiring future generations to continue this great endeavor.

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Received: June 28, 2021
Page Range: 22-29
Responsible Editor: Wang Chuanqing

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2. Contributions to Bibliometric Theory and Methodology Research

Mr. Meng entered the Chinese Academy of Sciences Library (predecessor of the Center) in 1979 to pursue his master's degree, becoming the first graduate student in library and information science trained by the institution. His earliest exposure to bibliometrics came through an expensive set of retrieval tools that the library subscribed to at the time: the Science Citation Index (SCI), published by the Institute for Scientific Information in the United States (predecessor of the Web of Science database). Due to SCI's novelty and complex usage methods, Mr. Meng systematically studied dozens of articles by SCI founder Dr. Garfield and other experts on SCI's applications in bibliometrics, translating several important articles into Chinese. Through this systematic study, he

not only mastered SCI's usage but also gained a profound understanding of its value in bibliometrics.

2.1 Attempting to Compile a Chinese Science Citation Index and Conduct In-Depth Citation Analysis

Given that SCI 收录 fewer than 10 Chinese journals annually at that time, which could not reflect the full picture of China's scientific development across various fields, Mr. Meng resolved to make "Chinese Scientific Citation Analysis" the topic of his master's thesis. He attempted to compile a Chinese science citation index from a domestic perspective, exploring bibliometric analysis and evaluation methods to macroscopically reveal the landscape of Chinese scientific development and academic connections among disciplines.

At that time, domestic bibliometrics research was just beginning, with published papers focusing primarily on concepts and characteristics of the discipline, studies of foreign core literature, the "half-life" of scientific literature, and introductions to information products such as SCI and JCR (Journal Citation Report). Research on Chinese-language bibliometric analysis theory and empirical studies was virtually nonexistent.

Without networks, microcomputers, or abundant computing resources, computers were extremely scarce, with weak functionality and prohibitively expensive purchase and operating costs. All computers were housed in purified, temperature-controlled, sealed machine rooms, and non-computer personnel had virtually no opportunity to even see them, let alone touch them. The concept of "literature databases" was still novel, and knowledge about data structures, files, records, fields, content retrieval, conditional matching, and Boolean logic was still being taught in computer science courses. There were no CD-ROM literature databases, China had not yet established international online retrieval terminals, and literature searches could only be conducted using printed retrieval tools. After finding article titles or abstracts, obtaining the full text was difficult. Chinese character encoding had not yet been invented, computers could not process Chinese characters, and Chinese databases were nonexistent. Building a Chinese scientific citation database and conducting Chinese scientific citation analysis was extraordinarily difficult under these circumstances. Mr. Meng forged ahead on this untrodden path, facing enormous technical and documentation challenges, and tackled a massive workload with an exploratory spirit and diligent effort, spending nearly two years conducting a series of research explorations.

His classmates Zhu Xianyou and Xu Zhiqiang from computer science helped develop dozens of data processing programs, solving problems of data entry, conversion, storage, analysis, result preservation, and input/output. Using the Center's newly imported IBM 1123 minicomputer and the WANG WS80 computer at the Beijing Computing Center, they conducted multiple data processing runs. Ultimately, they completed pioneering research in the history of Chinese

bibliometrics, establishing an experimental "Chinese Science Citation Database" and completing the master's thesis "Chinese Scientific Citation Analysis."

The thesis selected 132 of the most important Chinese scientific and technical journals at the time as source journals, using 7,658 academic articles published in these journals in 1980 as source documents, and indexed 58,846 citation documents related to these source documents, constructing a basic dataset for Chinese scientific citation analysis. Based on this dataset, numerous citation analyses of Chinese journal articles were conducted. The research yielded rich results that can be summarized as follows: (1) Creation of a Chinese Science Citation Index (CSCI) in three versions: card, paper, and magnetic tape. The content of the three versions was identical, but each had unique characteristics in data organization structure and specific query methods. (2) Establishment of an electronic Chinese Journal Citation Report document to reflect citation relationships among Chinese journals. (3) Discussion from a disciplinary perspective of Chinese scientists' utilization of literature in various languages and types when selecting references. (4) Discussion from a temporal perspective of differences in utilization time between Chinese and foreign literature, and the half-life of academic journals in various disciplines. (5) Discussion from a journal perspective of the dispersion and concentration phenomena of citations. (6) Application of co-citation analysis methods to discuss the citation structure of geoscience papers from an article perspective.

2.2 Significance and Impact of the Master's Thesis Research

The article "Chinese Scientific Citation Analysis," written based on part of the thesis and published in the first issue of *Information Science* in 1983, had a significant impact in academic circles and promoted the development of citation database construction and bibliometrics research and application across various fields in China. Its significance and subsequent influence are mainly reflected in the following aspects:

(1) Under extremely difficult technical conditions, it was the first attempt to construct a Chinese scientific citation database, exploring basic methods and processes for citation database construction and laying the foundation for subsequent establishment of the Chinese Science Citation Database. Building on this research achievement, the Chinese Academy of Sciences Library successfully applied for and received support from the National Natural Science Foundation in 1989 to create the Chinese Science Citation Database. As one of China's most important scientific literature databases, it has played an important role in providing literature information services and conducting citation analysis and evaluation for the scientific community, receiving affirmation from users and acclaim from academic circles.

(2) The establishment of CSCI and the citation analysis based on it represented an innovative exploration in China's bibliometrics field under the

historical conditions at that time. It not only widely disseminated knowledge about citation indexes and their applications domestically but also greatly promoted the development of bibliometrics research and application in China. Since then, many institutions and individuals in China have attempted bibliometrics research or citation database construction, with many referencing or drawing lessons from Mr. Meng's research results. CNKI database statistics show that as of March 2021, the article had been cited 272 times by documents included in CNKI and downloaded over 590 times. Some scholars conducted further analysis and supplementation of the paper's data and conclusions, while others proposed improvements to citation calculation methods, sparking a wave of discussion on citation analysis.

Many scholars have given high praise to the article. Some affirmed its pioneering nature, others considered it a substantial work with meticulous research in Chinese citation analysis, and some, through extensive data analysis, identified it as one of the most classic documents in China's library and information field in the 1980s, enjoying high prestige in the information community. In the late 1980s, the article received the "Excellent Paper Award for the 40th Anniversary of the Founding of the People's Republic of China and the 10th Anniversary of the Chinese Library Society" issued by the Chinese Library Society.

(3) Through comprehensive bibliometric analysis of CSCI using various data charts, the thesis revealed the citation and cited circumstances of Chinese scientific journals and researchers at that time, outlining the citation structure of Chinese scientific journal articles in 1980. It conducted analyses including the identification of Chinese scientific core journals, exploration of the half-life of Chinese scientific and technical journals, analysis of citation relationships among literature in various scientific fields, and research on the proportion of Chinese scholars' citations of foreign literature in various languages, as well as core authors and core papers in the geosciences field. These quantitative bibliometric indicators can serve as basic reference data for future similar studies. Through comparative analysis, they can reflect changes in China's scientific development regarding the utilization of different types and languages of literature and the evolution of citation relationships among literature in various disciplines.

(4) The comprehensive exploration of bibliometric research methods through empirical analysis deepened China's research in bibliometrics and expanded its international influence. The Chinese Academy of Sciences included the research achievement as part of its international academic exchange program, sending Mr. Meng to the Hungarian Academy of Sciences Library for academic exchange in 1985 and 1995. During these exchanges, he introduced not only his own exploratory work but also the research conducted by domestic colleagues in citation analysis and bibliometrics, enhancing mutual understanding and friendship between scholars of the two countries.

3. Contributions to Bibliometric Data System Construction

3.1 Leading the Creation of the Chinese Science Citation Database

After the publication of Mr. Meng's "Chinese Scientific Citation Analysis" paper, it generated considerable response in the industry. In subsequent years, the compilation of a Chinese science citation index gradually gained recognition and importance in China's library and information community, with many attempting to construct Chinese citation databases. For example, Yang Tingjiao and colleagues conducted trial database construction for a Chinese Science Citation Index, Jing Qinshu and colleagues conducted trial compilation of CSCI, and Shao Pinhong and Ren Anliang conducted system analysis and simulation experiments for establishing CSCI using microcomputers. Many university graduates also built experimental citation databases to complete master's or bachelor's theses in bibliometrics. These applied studies and theoretical discussions greatly advanced the development of bibliometrics and Chinese science citation database construction in China. However, due to the comprehensive and large-scale nature of citation database construction, and because conditions in terms of personnel, funding, materials, and technical means were not yet mature, these citation databases built under the circumstances at that time did not reach practical application levels in terms of technical means and data scale. They could not support the development needs of China's bibliometrics discipline nor meet the practical application demands of the scientific and technological community for a Chinese science citation database. Scholars across China continuously called for the establishment of CSCD and compilation of CSCI in various academic publications and conferences. With continuous deepening of theoretical exploration and gradual improvement of technical means, conditions for building China's own science citation database became increasingly mature.

Through the joint advocacy of Mr. Meng and many other domestic scholars, and after years of unremitting efforts by the Center, the project "Construction of the Chinese Science Citation Database" was finally approved by the National Natural Science Foundation in 1989 with support from visionary leaders at the Chinese Academy of Sciences and the National Natural Science Foundation Commission, receiving funding from the National Natural Science Foundation and matching funds from the Chinese Academy of Sciences. The Center then established a CSCD experimental development group. After initial successful trials, the Center formally established the CSCD project team in January 1991 to develop CSCD. At that time, Mr. Meng served as the head of the Center's Business Department and concurrently as the head of the Database Department and project team leader, comprehensively organizing CSCD construction.

Mr. Meng worked closely with Zhu Xianyou, the deputy director of the Database Department responsible for software development. Through the joint efforts of

all project team members, they completed a series of tasks including CSCD source journal selection, establishment of citation data processing standards and specifications, determination of data processing formats and workflows, development of data processing software, and the massive undertaking of literature data indexing and computer data processing. They also trained a group of full-time and part-time citation data indexers. At that time, the annual project funding of 30,000 yuan from the National Natural Science Foundation and the Chinese Academy of Sciences was far from sufficient to support project operations. The project team overcame many difficulties, and after five years of arduous efforts, CSCD finally achieved initial construction results. In 1995, the first printed edition of *Chinese Science Citation Index* was published, followed by the CD-ROM edition of "Chinese Science Citation Database" in 1996, and later the online CSCD retrieval service was realized. CSCD construction work was recognized by relevant departments of the Chinese Academy of Sciences and awarded the Second Prize of the Chinese Academy of Sciences Science and Technology Progress Award.

To promote CSCD and expand its application, Mr. Meng published numerous articles including "Establishment and Application Prospects of the Chinese Science Citation Database," "Structure and Utilization Methods of the Chinese Science Citation Index," "On the Nature and Function of the Citation Index Method," and "The Chinese Science Citation Database and Its Application in Scientific and Technical Journal Evaluation." He also delivered presentations at many national academic conferences and major meetings, introducing CSCD construction achievements and their application prospects in various fields.

3.2 The Position and Role of CSCD in the Development of Chinese Bibliometrics

When discussing the role and significance of Chinese citation database products such as CSCD, scholars including Qiu Junping explicitly stated that "these have provided modern tools for large-scale research and application of bibliometrics in China, greatly promoting the comprehensive development of Chinese bibliometrics. This represents one of the main signs and important achievements of Chinese bibliometrics development."

Bibliometrics is a highly quantitative and practical discipline that requires support from large-scale data for both theoretical research and practical application. Just as the publication and distribution of SCI in the United States powerfully promoted the comprehensive development of bibliometrics and is hailed as a landmark achievement in bibliometrics history, the same applies to the domestic situation.

After more than 20 years of development, CSCD has achieved remarkable success and is now on a healthy and rapid development track. The database has accumulated 5,659,836 source article records and 82,601,846 citation records from 1989 to the present, growing at an annual rate of over 200,000 source records

and approximately 2.5 million citation records. In 2007, the Chinese Science Citation Database cooperated with Thomson Reuters Scientific and, using the Web of Science platform, achieved cross-database retrieval with the Web of Science Core Collection, becoming the first non-English language database on the Web of Science platform. The Chinese Science Citation Database on the Web of Science platform is helping millions of Chinese scholars retrieve high-quality information, supporting users in obtaining full text through data linking mechanisms, accessing other database products and free academic resources on the Web of Science platform through cross-database retrieval, providing analysis of search results from multiple perspectives, managing references to improve writing efficiency, saving search queries to create SDI services, and more.

3.3 Promoting the Creation of the Database of International Science Citation

Since the early 2000s, Mr. Meng has worked part-time at the National Science and Technology Library. During his tenure at NSTL, he never stopped advancing citation database construction. The Database of International Science Citation (DISC) represents another important citation database that Mr. Meng vigorously advocated for and organized.

China invests substantial funds annually to purchase foreign citation databases. The Chinese Academy of Sciences alone spends millions of RMB each year on SCI, and the prices of foreign databases show an annual upward trend. Mr. Meng believed it was necessary and feasible for NSTL to establish DISC with independent intellectual property rights. With leadership support, NSTL established a research group led by Mr. Meng in 2005 to conduct in-depth investigations into NSTL's resources, standards and specifications, system platforms, and processing capabilities, as well as the construction and development trends of multiple international citation databases. The group wrote the "Feasibility Study Report on NSTL's Construction of the Database of International Science Citation (DISC)," actively promoting the early implementation of the DISC construction project.

NSTL possesses rich literature and information resources. In 2005, it collected 15,500 foreign journals, over 5,000 foreign conference proceedings, as well as reference books, dissertations, and technical reports. The total volume of foreign scientific and technical journals collected reached over 60% of the national total of similar resources. These resources cover natural sciences, engineering technology, social sciences, medicine and health, humanities, military affairs, politics, economics, law, and other fields. The selected journals all have high academic quality, representing the highest level of international scientific and technological development. Moreover, these documents have high editorial and publishing quality, with the vast majority of academic papers listing well-standardized references, meeting the necessary conditions for building a citation database.

NSTL also has years of experience in abstract database construction, having

established mature abstract data processing standards, specifications, and platforms, as well as standardized data processing workflows. It has cultivated a large talent pool for database construction and accumulated rich experience in constructing scientific and technical literature abstract databases and CSCD, making DISC construction feasible on this foundation.

Building a citation database with independent intellectual property rights can not only greatly add value to its existing abstract databases and provide new types of information services for users but also create a competitive situation with relevant foreign databases, reducing domestic subscribers' and users' dependence on foreign databases, restraining the price increase trend of relevant foreign databases to a certain extent, and reducing the country's overall expenditure on purchasing foreign databases.

Although NSTL had advantages for database construction, building DISC still required courage and determination in the mature citation database market, facing strong competitors such as SCI and Scopus, and needed clear positioning. To increase the success rate of project construction, DISC established clear objectives from the beginning: instead of one-sidedly competing with corresponding foreign databases in terms of the number of journals collected, it would start from the needs of Chinese scientific and technological users, integrate more resource information through citation database construction, and provide users with a series of services including citation queries, literature discovery, full-text provision, and reference consultation through NSTL's established literature information service network system.

During DISC construction, on the one hand, it maintained international standards, absorbing the advantages and strengths of existing citation databases; on the other hand, it fully exploited its own characteristics to avoid simply replicating other citation databases.

Through Mr. Meng's advocacy and efforts, DISC project construction received attention from NSTL leadership and full support from NSTL member units including the National Science Library of Chinese Academy of Sciences, Institute of Scientific and Technical Information of China, Information Institute of Chinese Academy of Agricultural Sciences, and Medical Information Institute of Chinese Academy of Medical Sciences. After thorough demonstration, the DISC project began intensive construction work. Mr. Meng served as the director of NSTL's Database Construction Department, directly responsible for organizing DISC research and construction. To ensure timely completion of this arduous DISC construction task, NSTL member units made substantial investments in funding, personnel, facilities, and equipment. The project team overcame difficulties, meticulously organized its work, and strictly managed and controlled processing standards, workflows, progress, and quality. With strong support from NSTL leadership, direct leadership from the data processing working group, and joint efforts from database construction personnel across various units, DISC was finally built after three years.

The system integrates citation data from selected excellent Western-language journals in science, engineering, agriculture, and medicine (from over 3,000 Western-language journals), becoming a powerful tool for revealing and analyzing relationships and relationship strengths between documents, providing literature retrieval for researchers, and discovering important scientific and technological documents worldwide to understand the context of global scientific research and development.

After more than ten years of development, DISC system service functions continue to improve. Through the system's literature discovery function, users can search and browse information from the integrated large-scale foreign literature data collection. To help users better locate needed documents, the system provides visual analysis functions for search results, including search result grouping, keyword cloud maps, publication year distribution, cited year distribution, author collaboration status, citation strength, and other visual analysis graphics for real-time online analysis of search results, helping users find needed documents based on relationships among documents within large search result sets. The system also provides citation search functions to discover the citation status of a document, the influence of an author's papers, and the influence of journals, books, patents, and other documents, thereby obtaining valuable literature information that has had important impact in scientific research. The system seamlessly links with NSTL's document delivery and document procurement services, supporting users in quickly obtaining full texts.

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4. Contributions to Bibliometric Application Practice

4.1 Promoting the Application of Citation Indexes in Scientific Literature Retrieval

Citation indexes provide not only general search approaches such as subject, title, author, publication name, and institution name but also cited reference search functions. Citation indexes compiled based on citation relationships between documents provide the most important feature of this type of retrieval tool: the ability to search from cited documents (citations) to citing documents (source documents). Documents can be retrieved regardless of discipline as long as citation relationships exist. Starting with retrieved documents as cited documents, users can snowball to continuously expand search scope and trace back to understand the entire development process of a concept or theory from its origin. Users can achieve cross-disciplinary comprehensive literature retrieval without needing to understand complex terminology thesauri or literature classification systems, demonstrating particular advantages for topics in new disciplines, new fields, and interdisciplinary and marginal subjects.

4.2 Promoting the Application of Citation Analysis in Scientific Journal Evaluation

To help more people recognize the role of citation analysis methods in scientific journal evaluation, Mr. Meng delivered presentations at various conferences and published detailed papers on this knowledge. In his article "Application of Citation Analysis Methods in Scientific Journal Evaluation Work," he introduced numerous journal evaluation indicators such as journal publication volume, journal citation rate, impact factor, and immediacy index. Mr. Meng considered journal citation rate and impact factor to be two relatively important indicators that, in a sense, can more directly reflect the quality of scientific and technical journals. His work vigorously promoted the application of citation analysis methods in scientific journal evaluation.

Some scholars compared the "Top 500 Chinese Scientific and Technical Journals by Citation Frequency" ranking compiled by the National Science Library of Chinese Academy of Sciences using CSCD with the core journal list in *Chinese Core Journals Overview*, finding that the core journals identified by both were basically the same, indicating that citation analysis evaluation of journals has relatively high accuracy. The method of evaluating journals using citation data has gained wide recognition in the scientific and technological community, and CSCD has been providing journal citation data for the scientific journal award evaluation work of the Chinese Academy of Sciences.

4.3 Promoting the Application of Citation Analysis in Quantitative Evaluation of Scientific Activities

Mr. Meng explicitly stated that another major advantage of citation indexes lies in their scientometric analysis function. Through statistical and analytical research on citation relationships, it is possible not only to qualitatively but, more importantly, to quantitatively analyze and evaluate various scientific activities. SCI founder Garfield once successfully predicted Nobel Prize winners in 1969 using citation data from SCI 1968, demonstrating that citation analysis methods have important reference value for researcher evaluation.

From a micro perspective, the more times a paper is cited, the higher the utilization of its research results, indicating greater theoretical and practical value. By counting the number of times papers are cited within a certain period and compiling a descending table of citation frequency, one can evaluate the level of scientific works and authors' influence on academia and contributions to society. Citation indexes have opened up extremely broad prospects for the application of bibliometrics in talent evaluation.

From a macro perspective, scientific and technical paper output is a concrete manifestation of a country's research level, and statistical data on scientific and technical papers can outline the macro state of a country's scientific and technological development. Through analysis of citation network relationships, it is possible to quantitatively and objectively reveal the overall picture of research

work and trace the historical process of scientific and technological development and literature exchange. Through statistics on publication volume and citation volume, it is possible to evaluate the overall research capacity of a scientific research institution or region.

Just as Mr. Meng hoped and envisioned, CSCD has played an important role in quantitative evaluation of scientific activities in China. Through the unremitting efforts of several generations of experts and database construction personnel at the Center, the scale of the CSCD database has expanded daily, service functions have improved daily, and influence and application have expanded daily. In recent years, CSCD has played an irreplaceable role in research management such as talent evaluation and institution evaluation in China. CSCD became one of the designated literature databases for querying research projects applying for the National Natural Science Foundation Committee's Youth Fund. CSCD is now widely used as an authoritative literature retrieval tool in various aspects of scientific research institutes and universities across China, including project novelty searches, fund support, project evaluation, achievement reporting, talent selection, and bibliometric and evaluation research. It mainly includes: (1) designated query database for the National Natural Science Foundation Committee's National Distinguished Young Scientist Fund; (2) designated query database for applicants of the 4th China Youth Scientist Award; (3) designated query database for post-performance evaluation of projects funded by the National Natural Science Foundation Committee; (4) designated query database for professional title evaluation, achievement reporting, and promotion assessment in numerous universities and research institutions; (5) query database for evaluation of national key laboratories of the National Natural Science Foundation Committee; (6) query database for candidates for the Chinese Academy of Sciences; (7) query database for Ministry of Education discipline evaluation; (8) query database for Ministry of Education Changjiang Scholars; (9) query database for the Chinese Academy of Sciences Hundred Talents Program.

The seedlings Mr. Meng planted through his arduous pioneering efforts have now grown into towering trees in full bloom across all fields of Chinese science and technology. The crystalline stones he laid on the path of bibliometrics development support every forward step of scholars in the field!

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5. Contributions to International Academic Exchange and Talent Cultivation in Bibliometrics

Mr. Meng also made important contributions to international academic exchange in bibliometric research and the cultivation of bibliometrics talent in China.

5.1 Contributions to International Academic Exchange in Bibliometrics

Like other disciplines, bibliometrics research is an international scientific activity. Therefore, to develop Chinese bibliometrics, it is essential to attach importance to international academic exchange and cooperation. Mutual understanding and exchange between Chinese scholars and foreign experts facilitate the absorption and reference of foreign achievements and experience, thereby promoting the comprehensive development of Chinese bibliometrics.

The Hungarian Academy of Sciences Library was the most in-depth unit in the world, besides the Institute for Scientific Information in Philadelphia, in utilizing SCI for bibliometrics research. The library had a bibliometrics research group under the leadership of Dr. Braun, specializing in research exploration in bibliometrics and publishing a series of papers with great international influence. Due to the international impact of Mr. Meng's work, Hungarian colleagues took notice, and bibliometrics research was selected as an academic exchange item by the Chinese and Hungarian Academies of Sciences. Relying on the exchange program between the two academies, Mr. Meng was invited to visit the Hungarian Academy of Sciences Library twice, in 1985 and 1995, spending two weeks each time conducting in-depth academic exchanges with Hungarian colleagues on bibliometrics research.

During his first visit to Hungary in 1985, Mr. Meng had in-depth exchanges with Dr. Braun, Dr. Schubert, Dr. Glanzel, and other members of the bibliometrics research group at the Hungarian Academy of Sciences Library. He learned in detail about their research fields, research approaches, and analytical methods, while also sharing his own and Chinese colleagues' research achievements and insights in this field. Hungarian experts affirmed and encouraged Mr. Meng's exploration and attempts in CSCI, stating that for a large country like China, it should not completely rely on data provided by SCI, which 收录 only a very small number of Chinese documents, but should instead use more adequate data collected independently to deeply analyze and evaluate the development of various disciplines in China. This approach has important practical significance for promoting the development of China's scientific and technological undertakings and reforming scientific and technological management work.

The Hungarian visit not only enhanced mutual understanding between scholars of the two countries but also strengthened Mr. Meng's determination to build China's own citation database. Based on what he learned during the visit and his own experiences, Mr. Meng published the article "A Model Combining Selective Dissemination of Information Services with Bibliometrics Research—Impressions on the Introduction and Utilization of Science Citation Index at the Hungarian Academy of Sciences Library," detailing the four different types of selective dissemination of information services and charging methods that Hungarian colleagues conducted using the subscribed Science Citation Index. This model, which balanced social and economic benefits, inspired the domestic

industry. He also provided detailed introductions to their bibliometrics and scientometrics research work, analyzing the keys to their success and experiences that could be used for reference.

Ten years later, in 1995, Mr. Meng was invited to visit the Hungarian Academy of Sciences Library again, this time accompanied by Jiang Ying, then a project team member and now deputy director of the Chinese Academy of Social Sciences Evaluation Research Institute. By then, CSCD construction had made substantial progress, and Mr. Meng detailed the achievements China had made in bibliometrics research and the progress of CSCD construction work. Deputy Director Braun and related experts gave high praise to the work of Chinese colleagues and offered many important suggestions on issues to which China should pay attention in conducting bibliometrics research and building citation databases, greatly enhancing Mr. Meng's determination and confidence to do well in citation database construction.

5.2 Contributions to Cultivating Bibliometrics Talent in China

Since the 1990s, Mr. Meng has been tirelessly cultivating library and information professionals, imparting professional knowledge through university teaching, training lectures, and graduate student supervision. By 2010, he had supervised 27 master's and doctoral students, many of whom have become backbone forces in research institutes and universities at home and abroad, contributing to the development of the field. Many of them have grown into doctoral or master's supervisors themselves, carrying forward Mr. Meng's passion for teaching.

Several of Mr. Meng's students have made impressive achievements in bibliometrics research. Due to their numerous publications, they cannot be detailed individually, but their bibliometrics research work during their master's or doctoral studies is briefly introduced here. Ding Ying is now a professor at the University of Texas at Austin. She used citation analysis methods to study the development of bibliometrics in China, identifying a batch of core papers, core authors, and core journals in bibliometrics research and application. Zhang Zhixiong is now deputy director, researcher, and doctoral supervisor at the National Science Library of Chinese Academy of Sciences. He used citation analysis and scientometrics methods to study the group of Chinese Academy of Sciences academicians as senior scientists, analyzing their disciplinary composition, age status, affiliated institutions, and geographical distribution, focusing on their education, national science awards, and citation circumstances of their works internationally and domestically, addressing issues of concern in the domestic scientific community and obtaining enlightening conclusions.

Li Hong is now a researcher at the Institutes of Science and Development of the Chinese Academy of Sciences. He deeply studied the theoretical foundations, structural functions, and development trends of citation index methods, compared the retrieval functions and effects of citation index methods with other indexing methods, studied various influencing factors and practical operational

characteristics in citation retrieval, discussed defects in citation index methods and their causes, and proposed improvement suggestions. Based on the understanding and mastery level of citation retrieval methods among Chinese users, he proposed recommendations for promoting citation retrieval methods. Gao Song used 21 English library and information science journals published between 1988-1996 as literature sources, and from the perspectives of source literature output analysis and citation analysis, explored the development trends of foreign bibliometrics literature over the past ten years, discussing issues such as author productivity, collaboration, research topics, bibliometrics discipline structure, research priorities, and hotspots. Li Rui is now a professor at Sichuan University who conducted in-depth and systematic research on citation behavior in patents, arguing that patent literature differs from scientific literature in that it is both technical and legal literature, and that analysis of citation relationships between patents cannot mechanically inherit scientific citation analysis methods. She compared the similarities and differences between patent citation behavior and journal paper citation behavior, identified three problems in patent citation analysis methods regarding the detection of relationships between science and technology, and from the perspective of patent law, pointed out that the technological advancement of a patent is not necessarily positively correlated with its citation frequency, and that the different meanings contained in examiner citations and applicant citations should be distinguished.

Throughout his academic career, Mr. Meng devoted tremendous effort to bibliometrics research and the construction of the Chinese Science Citation Database. To this day, when recalling how he overcame numerous difficulties in his work, tackled challenges one by one, and the various events during the struggle, he can recount many moving stories as if they were treasures, leaving younger generations deeply impressed by his genuine love for the library and information cause. Mr. Meng often says he was fortunate. As one of the earliest pioneers to attempt creating citation databases in China, he received support from the National Natural Science Foundation Commission and the Chinese Academy of Sciences. After unremitting efforts, his career achieved success and continues to develop, for which he feels grateful and proud. As Mr. Meng's students, we also feel honored and proud. In attempting to review Mr. Meng's research and practice journey through this article, we deeply feel that behind all achievements lies Mr. Meng's original aspiration for the library and information cause, his rigorous and pragmatic scholarly style, his courage to fill domestic gaps and face difficulties head-on, and his decades-long perseverance without being swayed by fame or fortune. May the intellectual and spiritual wealth he handed down to us endure for generations!

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Author Contributions:
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Ding Ying: Provided paper revision ideas and proofreading.

Not for Fame and Position, Years of Painstaking Work Bear Great Achievements—Meng Liansheng's Exploration and Influence in Bibliometrics and Chinese Science Citation Database Construction in China

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Abstract: *[Purpose/Significance]* This paper reviews and summarizes Professor Meng Liansheng's contributions to bibliometrics theory and methodology research, data system construction, practical research, international academic exchange, and personnel training, demonstrating his spirit of seeking, pioneering, and rigorous scholarship under arduous conditions. *[Method/Process]* Using literature research combined with character interviews, this paper studied his research process, results, significance, and influence. *[Result/Conclusion]* His innovative research has promoted the development of bibliometrics research and application in China and expanded China's international influence in this field. By leading the creation of CSCD and DISC databases, the application of bib-

liometrics methods in scientific and technological literature retrieval, scientific journal evaluation, and scientific activity evaluation has been promoted. These databases are important signs and achievements in the development of Chinese bibliometrics.

Keywords: Meng Liansheng; bibliometrics; scientometrics; Chinese Science Citation Database; Database of International Science Citation

Note: Figure translations are in progress. See original paper for figures.