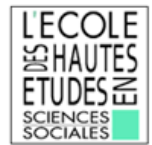




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New global scientific landscape is shaping up

Beijing, Tokyo, Paris, New York, Seoul, London... The world's largest scientific centers are losing some of their prominence due to geographical decentralization at the global scale, according to a team of researchers from the LISST (Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires, CNRS / Université de Toulouse II-Le Mirail / EHESS) who conducted a systematic statistical analysis of millions of articles and papers published in thousands of scientific reviews between 1987 and 2007. Their project, whose results were recently published on the *Urban Studies* website, was the first to focus on the geography of science in all the world's cities.

Geographic encoding, city by city, of all of the articles listed in the *Science Citation Index (SCI)* (1) between 1987 and 2007 shows that traditional scientific centers are not as prominent as they used to be: the combined share of the world's top 10 science cities dropped from 20% in 1987 to 13% in 2007. Researchers at the LISST (Laboratoire Interdisciplinaire Solidarités, Sociétés, Territoires, CNRS / Université de Toulouse II-Le Mirail / EHESS), aided by two collaborators at the CIRST (Centre Interuniversitaire de Recherche sur la Science et la Technologie) in Montreal, concluded that this phenomenon is accompanied by a general trend toward decentralization worldwide, especially in emerging nations. China offers a good illustration: the main provincial capitals are playing a much stronger role than they did in the past, and the skyrocketing development of science in China goes alongside with a geographical realignment. Whereas Beijing and Shanghai together accounted for 52.8% of the articles published by Chinese researchers in the *Science Citation Index* in 1987, this percentage dropped to 31.9% in 2007. Turkey is another striking example of an emerging nation whose scientific system has seen very rapid growth. In terms of the number of articles published, the country rose from 44th to 16th place worldwide between 1987 and 2007. Over the same period, its two main scientific hubs, Ankara and Istanbul, lost some of their pre-eminence within the country. While these two cities represented more than 60% of Turkey's scientific production in 1987, they now produce slightly less than half of the articles published by Turkish researchers. And, as in China, growth in scientific activity is accompanied by geographical decentralization: Turkey has more science hubs now than it did two decades ago, and its two traditional scientific capitals play a lesser role.

The US, which remains the world leader in terms of scientific production, is an exceptional case: the number of articles published by American researchers continues to rise steadily, but at a slower pace than in the emerging nations. Consequently, the country's share of worldwide scientific production is lower than it used to be: in 1987, the US represented 34% of the SCI, but by 2007 this figure had fallen to 25%. Nonetheless, the American scientific scene remains quite stable geographically: the role of its main



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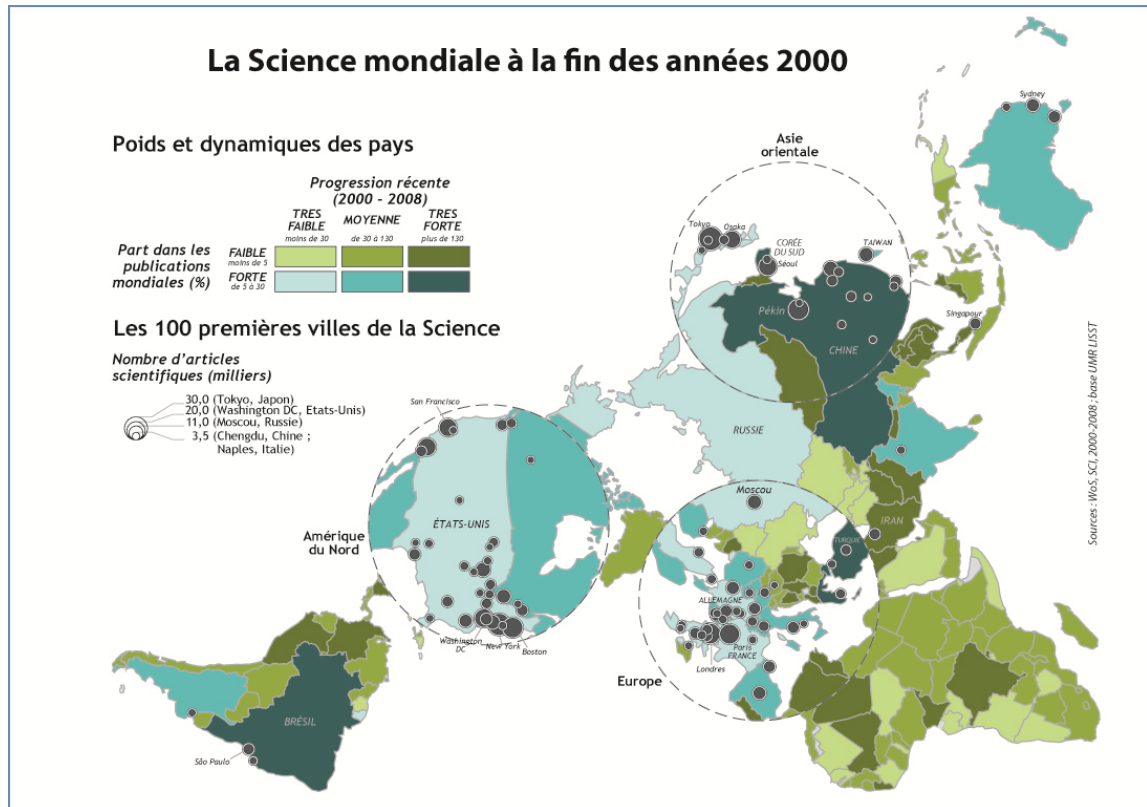


research centers has not evolved significantly because the US scientific establishment has always been one of the least centralized in the world, with research activities scattered across hundreds of cities of all sizes.

Does this development herald the decline of the great scientific centers? The fact that scientific activity is becoming more geographically decentralized on a worldwide scale does not imply that it is declining in large cities with a strong research tradition. The number of articles published in London, Paris, New York and Tokyo continues to rise every year. But the pace of growth in those traditional centers is slower than in others in the global scientific system. As more research is conducted in an increasing number of cities, the main scientific centers contribute a lesser share to the total.

The findings of this project, funded as part of an ANR program (2010-2013), challenge the assumption that scientific production inevitably tends to be concentrated in a few large urban areas, which therefore should be given priority in the allocation of resources.

(1) The Science Citation Index (or SCI) is a bibliographical database created in the US in 1964 for the purpose of documenting all scientific production worldwide. In its current version (SCI-Expanded), which is part of the Thomson Reuters Web of Science database (WoS), it registers more than one million scientific articles every year, encompassing the experimental sciences and sciences of the universe, medicine, the engineering sciences, etc., but not the humanities and social sciences, which are included in the SSCI. The SCI-Expanded records contain information on the content of each article (title, name of publication, summary, keywords), its author or authors (name, institution, city, country), and the list of references cited in the article.



conception et réalisation graphique Laurent Jégou ©UMR LISST

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