

Geographical Information Science: A Perspective of 1998

Zhilin Li* and Qiming Zhou†

*Department of Land Surveying and Geo-Informatics, The Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong

†Department of Geography, Hong Kong Baptist University
Kowloon Tong, Kowloon, Hong Kong

I. THE ORIGIN OF GEOGRAPHICAL INFORMATION SCIENCE

Geographical Information Science, as the name implies, is the science dealing with geographical information. It emphasises more on the scientific aspects of geographical information rather than its technological implementation, which has been the focus of geographical information systems. The term "geographical information science" is much newer than "geographical information systems". The latter was first introduced by Tomlinson (1967) 30 year ago while the former seems first appeared in an article by Goodchild (1990) for less than 10 years. Therefore, it is really a problem to determine where should be the starting point in an attempt to provide a perspective of geographical information science.

There must be different views regarding the history of geographical information science. Some may consider it as a more recent development while the geographical information systems as a technology becomes matured and research is emphasised on its scientific components. This is evidenced by the change of name for the then only academic journal in the field from *International Journal of Geographical Information Systems* to *International Journal of Geographical Information Science*. It is also evidenced by the proper name of this journal when it was established in 1995. However, some researchers consider the relationship otherwise. For example, Openshaw (1987) considered geographical information system as the "20th century technology being used for 19th century purposes". It means that the scientific foundation of many applications by geographical information systems was already laid even in the 19th century. Indeed, principles of some operations such as overlay have existed for a long time. In this sense, geographical information science could be as old as other scientific disciplines, since geographical information covers an enormous range "including the distribution of natural resources, the incidence of pollutants, descriptions of infrastructure, pattern of land use and the health, wealth, employment, housing and voting habits of people" (DoE, 1987).

It is also arguable that the start of an information science could be considered in an era when computer was used as information processor. Then late 1950s or early 1960s might be regarded as the reasonable period as the early days of geographical information science. Indeed, during this period, research articles began to appear in the literature on various aspects of geographical information such as automated cartography (Tobler 1959, Sawyer 1960), digital terrain modelling (Miller and Laflamme, 1958) and geographical analysis (Coppock, 1962).

II. EARLY DAYS OF GEOGRAPHICAL INFORMATION SCIENCE

The term geographical information covers a wide range and variety and any discipline dealing with such information may claim its contribution to the origin of geographical information science. However, it seems a consensus that the following two disciplines made most significant contribution, namely, automated cartography and quantitative analysis of geo-referenced data (geographical analysis).

In the area of automated cartography, some most significant establishments were initiated by the Experimental Cartography Unit (ECU) (see Rhind, 1988a), the Harvard Laboratory for Computer Graphics and Spatial Analysis (see Chrisman, 1988) and the University of Edinburgh (see Coppock, 1988). The Harvard Lab was founded in 1966 and a number of software packages for thematic mapping were developed. Among these, the most famous one was SYMAP which had over 500 sites installed world-wide. The Lab published research results in its journal called *Harvard Library of Computer Graphics*. In the 1960s and early 1970s, a number of statistical mapping packages were developed at the University of Edinburgh. A well-known one of these was GIMMS which was installed in over 200 sites in 12 countries. Unlike Harvard Lab and Edinburgh University, ECU, which

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