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NATIONAL GAZETTEERS

AUTOMATED DATA PROCESSING

An automated bi-scriptual gazetteer of Israel and the graphics of toponymy**

Paper presented by Israel

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** Prepared by Dr. N. Kadmon, Chief Cartographer, Survey of Israel, and Senior Lecturer in Cartography, Jerusalem University.

The treatment of geographical names is, in many cases, restricted to a philological and linguistic level, ignoring the basic differences between toponyms and other names, and especially the fact that they have to appear not only in "single-dimensional" lists or texts, but in two-dimensional maps.

Toponyms are characterized by a number of properties. First, whereas in the past they evolved naturally, they are today often generated methodically by national names authorities, especially in areas of rapid development. Secondly, toponyms, like other names, may appear in different scripts; even geographical names of unwritten languages require printing in maps and atlases. Thirdly, toponyms gain by and frequently require standardization, both at the regional and the international level. Fourthly, a toponym has locational value; Cairo written at co-ordinates x_1, y_1 on the River Nile is distinct from Cairo on the Mississippi at co-ordinates x_2, y_2. Furthermore, toponyms in the linear and areal categories often have direction, as in the case of a mountain range; in a linear feature such as a river, direction may even be variable. Finally, toponyms indicate function and magnitude via their graphic hard-copy form; a relationship exists between name gestalt expresssed through typeface and colour, and the nature of the place represented (city, river etc.), while character size denotes a quantitative attribute such as size of population of the city or width of the river.

A national names authority (in Israel the Names Commission in the Prime Minister's Office, in which the author serves as chairman of the Geographical Names Sub-Commission) must not only finalize and ratify name forms but, in a multilingual country such as Israel, transform them from one writing system to one or more others, for example Hebrew, Arabic and Latin. One of the first systems of name transformation must have been the Septuagint translation of the Old Testament from Hebrew into Greek, and especially passages such as Joshua, chapters 12 and 15 to 19. The United Nations Conference on the Standardization of Geographical Names recommends romanization through a single official transliteration system, such as the one used in all official Israeli maps and recommended by the Third Conference to be adopted for Israeli place names. 1/

Toponyms can be stored mentally, bibliographically, cartographically and digitally. The most efficient repository is the map, since here the disposition of toponyms is analogous to that in nature, except for the reduction of the number of dimensions from three to two.

A gazetteer is a hard-copy single-dimensional listing of toponyms either serving as a substitute for, or supporting, a map, stored bibliographically, composed traditionally by hand and in the present case by computer lineprinter.

A national gazetteer occupies a central position in cartography. On the one hand it is used as an aid in producing maps, with place names taken from it.

1/ Third United Nations Conference on the Standardization of Geographical Names, Athens, 17 August-7 September 1977, vol. I, Report of the Conference (United Nations publication, Sales No. E.79.I.4), p. 29, resolution 13.

On the other hand, map references of objects described by toponyms are extracted from maps for the production of gazetteers. A stored record in a gazetteer should include the name, a numerical code for the generic type of item represented, a descriptor of magnitude for items of a quantitative character, spherical or plane locational co-ordinates, and height where relevant. However, administrative data and particulars of the toponomastic process may also be of interest. Computer output (ephemeral such as on a CRT screen, or hard-copy such as on a printer or plotter) can convert the numerical codes into verbal descriptions.

Automation in toponymy can be directed towards serving a number of needs concerned with the production both of single-dimensional name lists and two-dimensional maps. On the one hand it can speed up the production of gazetteers and other name lists such as those accompanying certain map sheets (not first editions, but revision and updating). It permits printout classified according to different criteria such as specific and generic component of the name, type of feature, location, date of ratification, ratifying authority etc. On the other hand it can aid in typesetting the names on computerized photo lettering equipment in chain-like (1-D) mode, or plotting them on automated plotters in 2-D mode.

The "Survey of Israel" has produced an automated gazetteer printed simultaneously in two scripts - Hebrew and Latin - on a computer lineprinter with a bi-scriptual printing chain. It prints in a single line the official name in Hebrew script, former names (also in Hebrew), the official transliteration 2/ into Latin script, local topographic (rectangular) map co-ordinates (two sets for spatially-extended features such as rivers or mountain ranges), height above sea-level and a type-and-magnitude code enabling link-up with an automated plotter as well as with a type-composing machine. This includes 24 different items such as cities and towns of different size, rivers, springs, mountains, archaeological sites, nature reserves, marine features etc. Each record also includes details of the toponomastic process such as the authority which ratified the name, date of ratification and number of the report of the Names Commission and the Government Gazette in which it was published.

The accompanying illustration shows a page from the English version of the gazetteer. However, printout can be produced, with either Hebrew or English headings, arranged alphabetically by Hebrew alphabet, by type of feature, by co-ordinates, by date of ratification of the official name, and sorted by various other criteria. At present all 6,068 officially ratified place names in Israel are stored in the system. Data were initially stored in 128-character records on punch cards; later they were stored on floppy disks, finally being transferred to mainframe disks, with magnetic tape as backup. Programmes for processing on a Data General Eclipse computer and printing in the various options were written in FORTRAN V by the author. An increasing number of institutions are making use of this gazetteer, from the Cartography section of the Government Survey Department

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2/ N. Kadmon and M. Talmi, The Transliteration of Geographical Names in the Topographic Maps of Israel (Israel, Department of Surveys, Cartographic Papers, No. 4 Tel-Aviv, 1969)(Hebrew, with English abstract).

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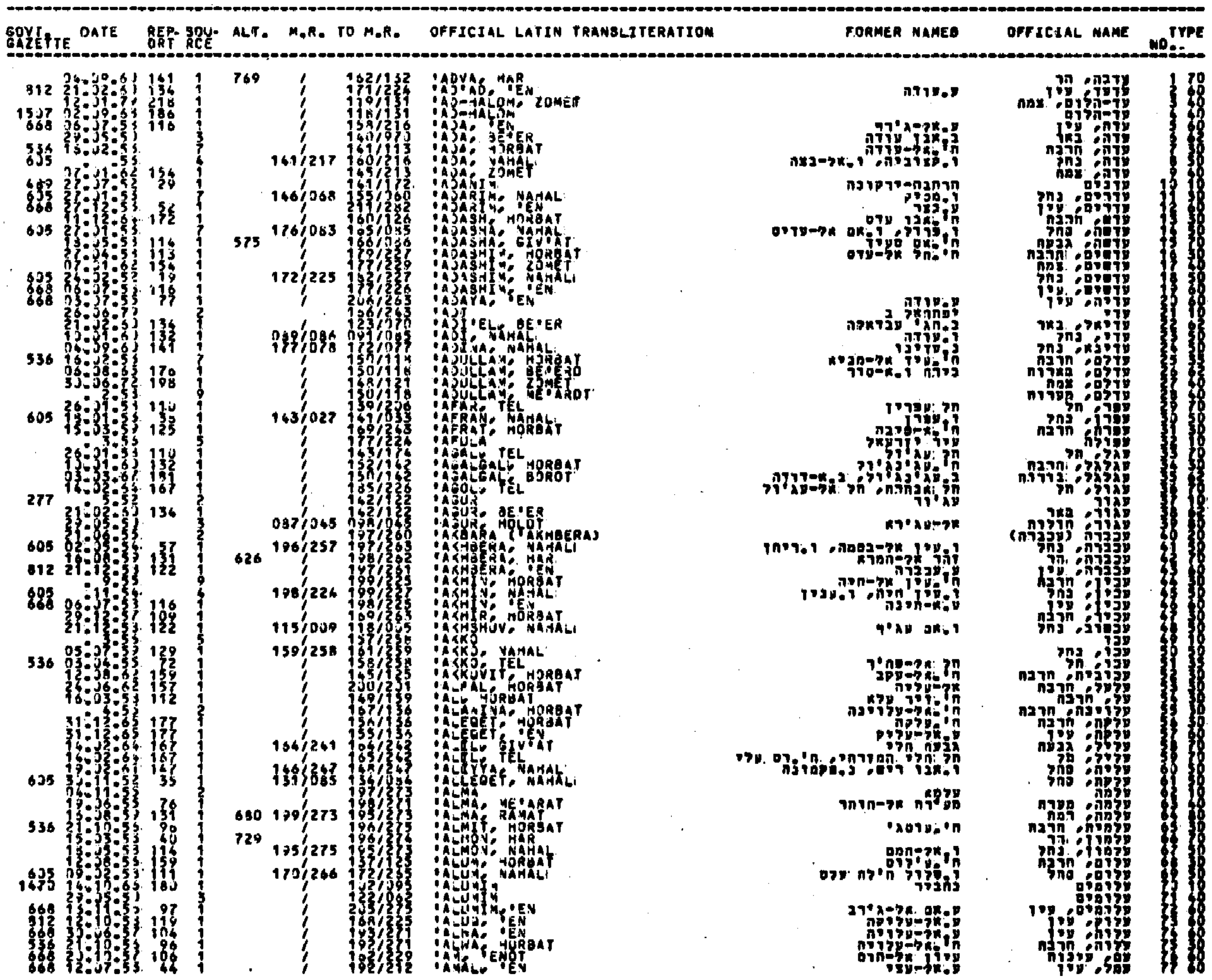

Figure 1. A page from the English version of the automated Hebrew-Romanized Gazetteer of Israel. Items in heading should be read from right to left in accordance with Hebrew usage. High-density printing serves internal use only.

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for mapping work, to the Botany Department of Jerusalem University in studying plant distributions. Interesting statistics on toponomastic procedures and processes, too, have been prepared with the aid of this automated bi-scriptual gazetteer, such as finding the change in the annual rate of name generation.

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Based on the paper "A Bi-Scriptual Gazetteer of Place Names in Israel produced by Computer", by N. Kadmon (ONOMA, vol. XXIV, 1980, pp. 98-102).