

be positioned on geo-referenced gridded maps. The initial and most important single scheme was carried out by a colonial body *par excellence*, a detachment of the Napoleonic Egyptian expeditionary forces. Formed on the spot in 1798, the Service topographique de l'armée d'Égypte worked as a veritable survey authority, although understaffed and obstructed by many external imperfections. By 1801 it had achieved the first triangulation of some parts of the region. The survey resulted in the first map of the Middle East along modern principles. Forming part of the *Description de l'Égypte*, 47 sheets were printed on a scale of 1:100,000 showing the settled areas along the Nile, the Mediterranean coast of Sinai, and the Levant up to Sidon in great detail and expressive graphic style.³¹

This pioneering work was recommenced in Egypt only after the establishment of the Egyptian Survey Authority in 1878—the very year the British and French disempowered the Khedive.³² Western Palestine saw an interlude from 1871 to 1878, when British military personnel mapped most of the area on behalf of the—specially founded—Palestine Exploration Fund (PEF),³³ before finally, in 1920, the British established the Survey of Palestine.³⁴ In Syria and Lebanon, large-

³¹Field work was conducted from 1798 to 1801, and the engraving of the plates in Paris was completed in 1803. Put to press in 1808, the map was guarded as a state secret and published only ten years later, then entitled “Carte topographique de l'Égypte et de plusieurs parties des pays limitrophes levée pendant l'expédition de l'armée française . . . à l'échelle de 1 millimètre pour 1000 mètres.” Together with a three-sheet version on a reduced scale, it constituted the *Atlas géographique*, ed. Pierre Jacotin (Paris, 1818), being part of the *Description de l'Égypte, ou Recueil des observations et des recherches qui ont été faites en Égypte pendant l'expédition de l'armée française*, édition impériale. The reprint of the atlas (Paris, 1826) within the 2nd ed. or édition royale is now also accessible through the DVD edition of the corpus by the Bibliotheca Alexandrina (Alexandria, 2004). This includes Jacotin's “Mémoire sur la construction de la carte de l'Égypte,” *Description de l'Égypte: État moderne*, 1st ed., vol. 2.2 (1822), 1–118 (= 2nd ed., vol. 17 [1824], 436–652), and the “Index géographique, ou Liste générale des noms de lieux de l'Égypte . . .,” in *ibid.*, 787–846 (= 2nd ed., vol. 18.3 [1830], 35–266). See Anne Godlewska, *The Napoleonic Survey of Egypt: A Masterpiece of Cartographic Compilation and Early Nineteenth-Century Fieldwork* (Toronto, 1988) = *Cartographica* 25 (1988), 1/2; Ghislaine Alleaume, “Entre l'inventaire du territoire et la construction de la mémoire: L'œuvre cartographique de l'expédition d'Égypte,” in *L'expédition d'Égypte: Une entreprise des lumières 1798–1801*, ed. Patrice Bret ([Paris], 1999), 279–94.

³²Its major mission to produce a cadastral survey did not progress well. Replaced by the Survey Department in 1898, activities regained momentum and resulted in a cadastral map series of more than 30,000 sheets on a scale of first 1:4,000, later 1:2,500 (Cairo, 1892–1918). See *La cartotheque méditerranéenne*, <http://cartomed.mmsh.univ-aix.fr/mmsh/Egypte/series/G16.swf> and [~/G98.swf](http://cartomed.mmsh.univ-aix.fr/mmsh/Egypte/series/G98.swf).

³³Claude Conder and Horatio Herbert Kitchener, *Map of Western Palestine in 26 Sheets from Surveys Conducted for the Committee of the Palestine Exploration Fund . . . during the Years 1872–1877*, scale 1:63,360, one inch to the mile (London, 1880), indexed by *Arabic and English Name Lists*, ed. Edward Henry Palmer (London, 1881).

³⁴Clifford W. Mugnier, “Grids and Datums: The State of Israel,” *Photogrammetric Engineering and*



scale³⁵ mapping languished until in 1918 the same rush for mandatory institution-building impelled France to set up the Bureau topographique de l'Armée française du Levant.³⁶ One need not be a Foucauldian to notice that the cartography of the Middle East was thus deeply rooted in the European struggle for domination.

In the meantime, the agents of mapping projects were individuals, or at most tiny companies of scholars and/or adventurers, who traveled on behalf of an inquiring princely Maecenas, an academic society, or on their own behalf. Following the example of Carsten Niebuhr, most traveler-explorers in the Orient were trained in the use of astronomic and geodetic devices, as well as the scrutiny of textual sources. They supplemented the positioning of sites by asking how historical place names preserved in ancient and medieval literature ought to be identified against the background of recent toponymy. Consequently, large-scale maps of selected small regions were often produced together with an onomastic commentary and tentative historical geography.

The better of these mapping projects not only appealed to the Orientalist but were on the cutting edge of geography and cartography. Hence, it is not surprising that researchers and professional cartographers encouraged and supported each other. Alois Musil's map "Northern Arabia"—companion to his four volumes of topographical itinerary—lent the crowning glory to that map-cum-text genre,³⁷ but even though he was a highly-trained and untiring map maker,³⁸ he had the map drawn by the Militärkartographisches Institut in Vienna, one of the most advanced institutions of its kind at that time. Probably the most productive liaison

Remote Sensing (abbr. *PE&RS*) 66 (2000): 915b; Dov Gavish, *A Survey of Palestine under the British Mandate, 1920–1948* (London, 2005), based on his *Qarqa' u-mapah: Me-hesder qarqa'ot le-mapat Erets Yisra'el, 1920–1948* (Jerusalem, 1991).

³⁵Even cartographers get confused once in a while about what is termed large and small. Thus it may be helpful to mention that scales are fractions; hence a scale of 1:10,000 (one ten-thousandth) is larger than a scale of 1:1,000,000 (one millionth).

³⁶Clifford J. Mugnier, "Grids and Datums: The Syrian Arab Republic," *PE&RS* 67 (2001): 1000–3.

³⁷Alois Musil, *Northern Arabia*, scale 1:1,000,000, on four sheets (New York, 1926), accompanying four of his monographs in the American Geographical Society's Oriental Explorations and Studies series, vols. 2–5 (previously published as *Karte von Nordarabien, nach eigenen Aufnahmen*, same scale [Vienna, no date]). Along the course of the Euphrates it adjoins the map "Southern Mesopotamia" on the same scale, attached to his *The Middle Euphrates: A Topographical Itinerary*, vol. 3 of the series (New York, 1927), while the southwestern sheet is elaborated by the map on a scale of 1:500,000 which is attached to his *The Northern Heğâz: A Topographical Itinerary*, vol. 1 of the series (New York, 1926).

³⁸E.g., his journey of 1908–9 yielded no less than 61 manuscript maps on a scale of 1:300,000 of 37 × 35.5 cm each with an approximate 3,000 place names. See Musil's communication in the Viennese *Anzeiger der Kaiserlichen Akademie der Wissenschaften: Philos.-hist. Kl.* 47 (1910): 188–89. The series merged in the map *Northern Arabia* (see n. 37).



across the disciplines was established between the distinguished geographers and cartographers Heinrich Kiepert (1818–99) and Richard Kiepert (1846–1915) and several scholarly explorers, among them Edward Robinson and Eli Smith, L. M. A. Linant de Bellefonds, Richard Lepsius, Johann Gottfried Wetzstein, Eduard Sachau, Carl Humann, and Max Freiherr von Oppenheim.³⁹ While the Kiepersts regarded their reports and drafts as full-fledged sources, the ensuing maps of the Middle East helped define the state of the art in regional cartography and in return cleared the way for other explorers to come. Despite many inevitable shortcomings, the best of these maps remained in use for decades and served as a basis for later topographical studies until World War I.⁴⁰

Understanding the contemporary topography was considered such an essential prerequisite to historical understanding that historiographic mapping itself was discouraged for most of the nineteenth century. As long as the determination of coordinates was the focus, stock-taking implied a tendency to absorb the remnants and toponymic substrata of different eras and blend them into area-specific maps. This has been demonstrated in the case of the Napoleonic scholars whose policy on toponymy was directed towards standardization.⁴¹ Although mapping seemed urgent enough to leave nothing undone, several regions remained difficult to access and therefore survey, and were thus even more aptly subjected to historical reconstructions. Such conditions prevailed beyond the Nile Valley and the Fertile Crescent. It is for this reason that Ferdinand Wüstenfeld, who had neither been to the region nor considered doing so, could dare to combine a tentative geographical outline with place names derived from medieval Arabic historians and geographers. The first such map was lent credence by having been

³⁹E.g., Heinrich Kiepert, “A New Map of Palestine Including also Phoenicia and Coelesyria,” scale 1:600,000, on two sheets in Edward Robinson, Eli Smith, et al., *Later Biblical Researches in Palestine and the Adjacent Regions: A Journal of Travels in the Year 1852* (London, 1856), following 664; H. Kiepert, eight maps on various scales in Richard Lepsius, *Denkmaeler aus Aegypten und Aethiopien*, plate vol. 1 (Berlin, [1859]), pls. i–vi, some based on Linant de Bellefonds and Lepsius himself; H. Kiepert, “Die Landschaften im Osten von Damaskus (Ḥaurân und Trachonen),” scale 1:400,000, in Johann Gottfried Wetzstein, *Reisebericht über Hauran und die Trachonen nebst einem Anhang über die sabäischen Denkmäler in Ostsyrien* (Berlin, 1860), preceding p. i; H. Kiepert, two maps on a scale of 1:750,000, attached to Eduard Sachau, *Reise in Syrien und Mesopotamien* (Leipzig, 1883); H. Kiepert, “Karte des nördlichsten Theiles von Syrien,” scale 1:300,000, in Carl Humann and Otto Puchstein, *Reisen in Kleinasien und Nordsyrien*, atlas (Berlin, 1890), preceding pl. i; Richard Kiepert, map on a scale of 1:850,000 on two sheets, attached to Max Freiherr von Oppenheim, *Vom Mittelmeer zum Persischen Golf durch den Ḥaurân, die Syrische Wüste und Mesopotamien* (Berlin, 1899/1900), also separately published (Berlin, [1915]).

⁴⁰E.g., see Gavish, *A Survey of Palestine*, 12, 14–15.

⁴¹Alleaume, “Entre l’inventaire du territoire et la construction de la mémoire,” 282–85.



executed by Heinrich Kiepert,⁴² but as the successive maps bear only Wüstenfeld's name it is conceivable that the venture had proven unrewarding to the specialist.⁴³ After all, intense and fruitful cooperation between cartographers and historians, philologists, and others lasted only as long as the political situation on the ground did not allow for regular surveying along technical lines.

2. DIVERGING PATHS

The turning point in the relationship between topography and historiographic mapping was reached when the example of Egypt was followed in the establishment of survey authorities all over the region at the beginning of the British and French mandatory administrations. A bifurcation took place. On the one hand, hosts of professional engineers, geodesists, and cartographers took up work in a field which was now pacified. At the same time, the heterogeneous national or mandatory mapping activities in the region began to adapt—due to the first internationally agreed-upon mapping scheme, the *Carte internationale du monde/International Map of the World*⁴⁴—to a system of divisible metric scales and sheet lines.⁴⁵ The cartographers applied ever better scales and more sophisticated techniques to the areas previously mapped and set about filling in the blanks. Only part of the interior of the Arabian Peninsula retained for some time the air of

⁴²Heinrich Kiepert, map on a scale of 6 cm to 150 *mīl* or 50 *farsakh* (i.e., ca. 1:5,000,000) in Ferdinand Wüstenfeld, "Die Strasse von Baġra nach Mekka mit der Landschaft Dharīja, nach arabischen Quellen bearbeitet," *Abhandlungen der Königlich-Gesellschaft der Wissenschaften zu Göttingen: Hist.-philol. Cl.* (abbr. *AGWG*) 16 (1871): following 89.

⁴³Ferdinand Wüstenfeld, map on a scale of 6.7 cm to 140 *mīl* (i.e., ca. 1:4,000,000) in his "Das Gebiet von Medina, nach arabischen Geographen beschrieben," *AGWG* 18 (1873): facing 86; idem, map not to scale in his "Baġrein und Jemâma, nach arabischen Geographen beschrieben," *AGWG* 19 (1874): facing 222. Both maps as well as that in n. 42 were also included in the monographic offprints (Göttingen, 1871, 1873, and 1874).

⁴⁴The framework of the World series on the millionth scale, published from 1913 on, sprung from a proposal of 1891 and was agreed upon by international conferences at London 1909, Paris 1913, and Cambridge 1928. It was projected under the combined aegis of national, colonial, and mandatory survey authorities and published accordingly by a multiplicity of bodies. The Middle East was the responsibility of Great Britain's Ordnance Survey, Southampton, except for Egypt which was covered by the Survey Department, later Survey of Egypt, Giza. Collaboration broke off during World War II at a state of about a sixth of the planned number of sheets; it was resumed in 1945 and continued from 1953 on under the auspices of the United Nations until it petered out in the mid-1980s while still less than half of the sheets had been achieved. The relative importance which was attributed to Egypt, Palestine, Syria, and Iraq is illustrated by the fact that they counted among the well covered areas of the World series even before World War II.

⁴⁵As the pace of integration was slow, the various grids (Egyptian quadrant/standard and kilometric/normal grids, Palestine grid, Lambert Levant grid, etc.) remained in use well into the mid-twentieth century.



terra incognita to the Western observer.⁴⁶ As now even many remote and sparsely settled areas could be surveyed, it became possible to expand the representation of the topography beyond the river valleys and densely populated areas onto the entire region. Only then did maps attain a fully two-dimensional quality. Furthermore, the replacement of old-style provisional hachures, form lines, and hillshades by contour lines and elevation coloring allowed map-makers for the first time to shape a consistent and reliable overall picture of the region's three-dimensionality. In the case of Egypt, coverage had proceeded so far as to allow the compilation of atlases.⁴⁷ As professional cartography outgrew its dependence on the contribution of semi-skilled enthusiasts, the physical aspect became dissociated from the historical.

On the other hand, specialization, as well as technical and organizational progress, could not leave the mapping activity of men of letters untouched. In fact, it suffered badly. The publication of Musil's map of Northern Arabia in 1926, though marking the apogee of the older one-man business, was belated, the basic inquiries having been conducted between one and almost two decades earlier. Consequently, it was also anachronistic in that it mirrored pre-World War I requirements of primary exploration.⁴⁸ Only in the field of historical geographies and gazetteers could advantage be taken of the European preeminence over the region in the period until the end of World War II. Several works of lasting value were compiled on that background, e.g., by René Dussaud on Syria and Lebanon⁴⁹ and by the British Naval Intelligence—for official use only—in its geographical handbook series on most of the region.⁵⁰ The way had been paved in pre-1900 Egypt by 'Alī Bāshā Mubārak's geographical lexicon and the country's surveyors.⁵¹

⁴⁶The first modern map series superior to the millionth scale, a work of collaboration between the U.S. Geological Survey and the Arabian American Oil Company, was executed only from the late 1950s on: *Geographic Map . . . , Kingdom of Saudi-Arabia*, scale 1:500,000, 21 maps (Washington, D.C., 1956–62), accompanied by *Arabian Peninsula: Official Standard Names Approved by the United States Board on Geographic Names* (Washington, D.C., 1961).

⁴⁷*Atlas of Egypt*, scale 1:50,000, 2 vols. (Cairo, 1914); *Atlas of Egypt: A Series of Maps and Diagrams with Descriptive Text Illustrating the Orography, Geology, Meteorology and Economic Conditions*, scales 1:500,000 to 1:7,500,000 (Giza, 1928).

⁴⁸For an exemplary description of his mapping method that also concedes various sources of inaccuracy see Alois Musil, *Arabia Deserta: A Topographical Itinerary* (New York, 1927), xiii–xvi.

⁴⁹René Dussaud, *Topographie historique de la Syrie antique et médiévale* (Paris, 1927).

⁵⁰Originally, only a few classified copies were sent to press. They are now accessible through two series of reprints: *A Collection of First World War Military Handbooks of Arabia, 1913–1917*, 9 vols. (Farnham Common, 1988), and *The Middle East Intelligence Handbooks 1943–1946*, 5 vols. (Gerrards Cross, 1992).

⁵¹'Alī Bāshā Mubārak, *Al-Khiṭaṭ al-Tawfiqīyah al-Jadidah li-Miṣr al-Qāhirah wa-Mudunihā wa-Bilādihā al-Qadimah wa-al-Shahirah*, 20 vols. (Bulāq, 1887–89). A selection of the older Orientalist research



There, historical geography flourished so much that a voluminous special bibliography could be compiled as early as 1929.⁵²

A special point must be made about Palestine as the initial focus of Western Middle East mapping. The country's special place as the Holy Land has nourished a prolific mutual relationship between men of letters and cartographers ever since the Middle Ages. Recalling that Palestine already formed part of the Napoleonic survey and that the 1880 PEF map of Western Palestine marked another groundbreaking step, it became virtually over-mapped in both topographical and historical regards, although Muslim affairs were dealt with far less than Biblical and Crusader matters. Accordingly, Palestine was also the first and only part of the region that attracted continuous carto-bibliography.⁵³

Aside from the Holy Land, however, the individual scholarship of Orientalists could not maintain its importance opposite the advancement of surveys on a regional scale. The interest of Orientalists in mapping declined and simultaneously focused *volens nolens* on historical matters. As the status of cartography sank to the point that it was deemed an ancillary science, that which remained to be done was taken over by non-cartographers—a fact which proved detrimental to quality. It is not necessary to focus on any particular specimen of Orientalist (not to mention Mamlukist) research to illustrate this point, nor would it be fair to do

has been assembled in *Texts and Studies on the Historical Geography and Topography of Egypt*, 5 vols., ed. Fuat Sezgin (Frankfurt am Main, 1992). Besides, the constriction of Egypt to the banks of the Nile together with the intensity of cultivation there conditioned a cadastral—and thus chiefly contemporary—approach to geography. See *Dictionnaire des villes, villages, hameaux, etc. de l'Égypte* (Bulāq, 1881); [Albert Boinet], *Dictionnaire géographique de l'Égypte*, and its Arabic version, *Qāmūs Jughrāfi lil-Quṭr al-Miṣri* (both Cairo, 1899); [idem], *Géographie économique et administrative de l'Égypte*, vol. 1 (Cairo, 1902, no more published). See also, in the historical field, Jean Maspero and Gaston Wiet, *Matériaux pour servir à la géographie de l'Égypte*, vol. 1 (Cairo, 1919, no more published).

⁵²Henri Munier, *Bibliographie géographique de l'Égypte*, vol. 2, ed. Henri Lorin (Cairo, 1929). Carto-bibliography was as well restricted for a long time to either Palestine or Egypt. See n. 53 and Alfred L. Fontaine, *Monographie cartographique de l'isthme de Suez, de la péninsule du Sinai, du nord de la Chaîne Arabique, suivi d'un catalogue raisonné sur les cartes de ces régions* (Cairo, 1955).

⁵³Reinhold Röhricht, *Bibliotheca geographica Palaestina: Chronologisches Verzeichniss der auf die Geographie des Heiligen Landes bezüglichen Literatur von 333 bis 1878 und Versuch einer Cartographie* (Berlin, 1890), 2nd ed. procured by David H. K. Amiran (Jerusalem, 1963), especially 598–662. Materials published between 1878 and 1945 were recorded by Peter Thomsen, *Die Palästina-Literatur: Eine internationale Bibliographie in systematischer Ordnung mit Autoren- und Sachregister*, 5 vols. (Leipzig and Berlin, 1908–38), sections 4 and 5, and three posthumous supplementary volumes (Berlin, 1956–72). The quarterly Jewish (later, Israeli) national bibliography *Qiryat Sefer* has continued the report (Jerusalem, 1924/25–2003), first without a special rubric, later in section 14. It now works as an online resource, http://aleph500.huji.ac.il/F/?func=file&file_name=find-b&local_base=nnlqrs&con_lng=eng.



fact, electronic mapping on the basis of georeferenced remote sensing data is invaluable for the achievement of a precise topography in which history can be embedded soundly. Speaking in general, combination with a digital elevation model (DEM) allows for a three-dimensional impression with a vast potential to fuel one's spatial imagination and is yet technically impeccable. Furthermore, the integration of electronic maps in a geographical information system (GIS) opens up unforeseen possibilities of thematic analysis, interpretation, and presentation.⁸⁴ Finally, distribution of the results in electronic form is a welcome opportunity to advance the recognition and further study of spatial contexts in history.

⁸⁴See *Islamic Area Studies with Geographical Information Systems*, ed. Okabe Atsuyuki (London, 2004).

