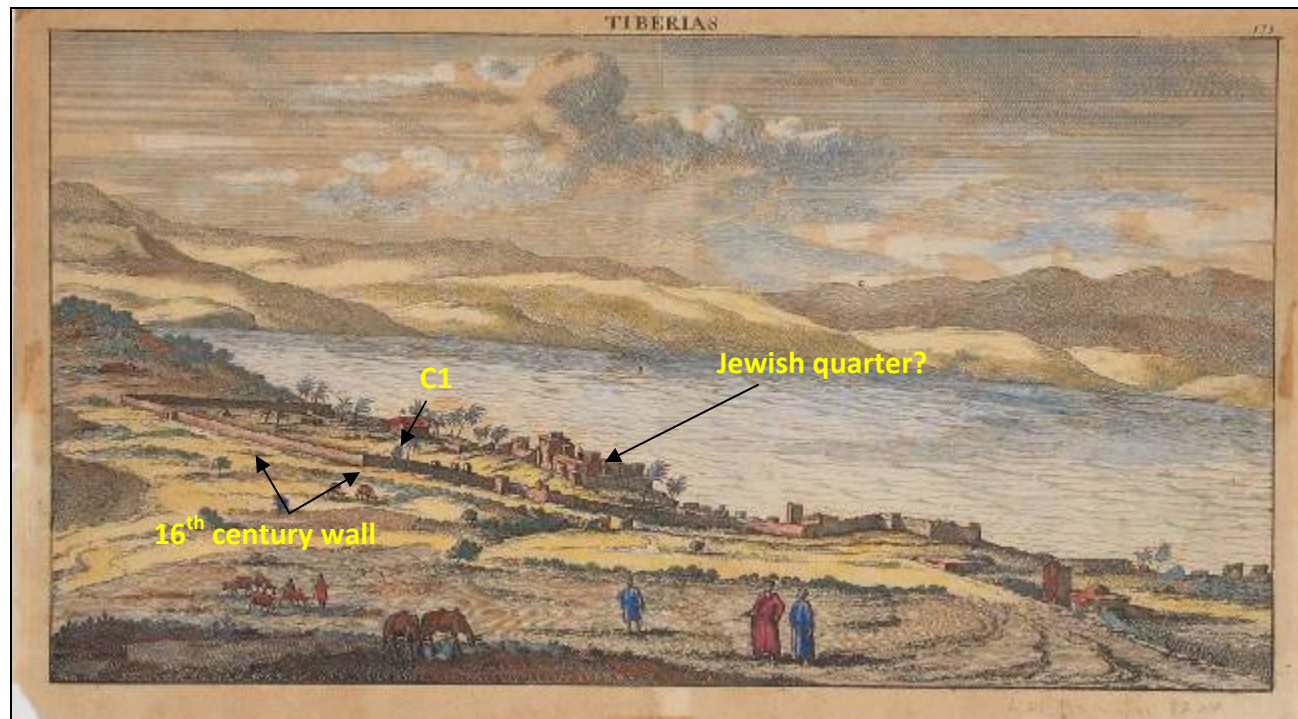


**Appendix 1:** Visual sources (Drawings, maps, sketches, photographs and air photos) used in this study for reconstruction of the 3D models of Tiberias prior to and after the 1837 earthquake. Some of the sources were compared to recent photographs (taken by M. Zohar and R. Rubin in 2013 and 2015) in order to identify prominent structures of Tiberias at the time (see also Table 2).

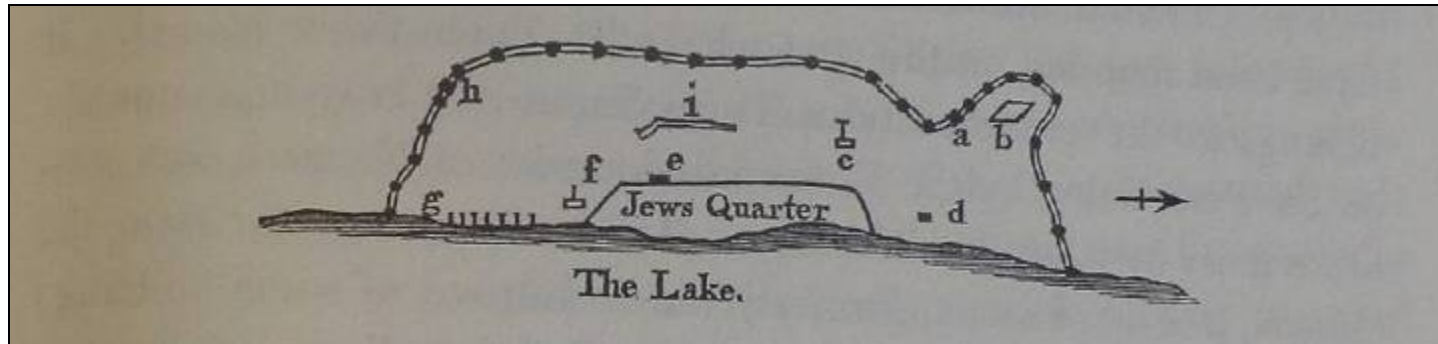
### Sources describing Tiberias prior to the earthquake



1. **1681:** Tiberias walls before the reconstruction of Dahir al-Umar. Note the church of St. Peter (C1) and the probable location of the Jewish quarter (de-Bruyn, 1702)

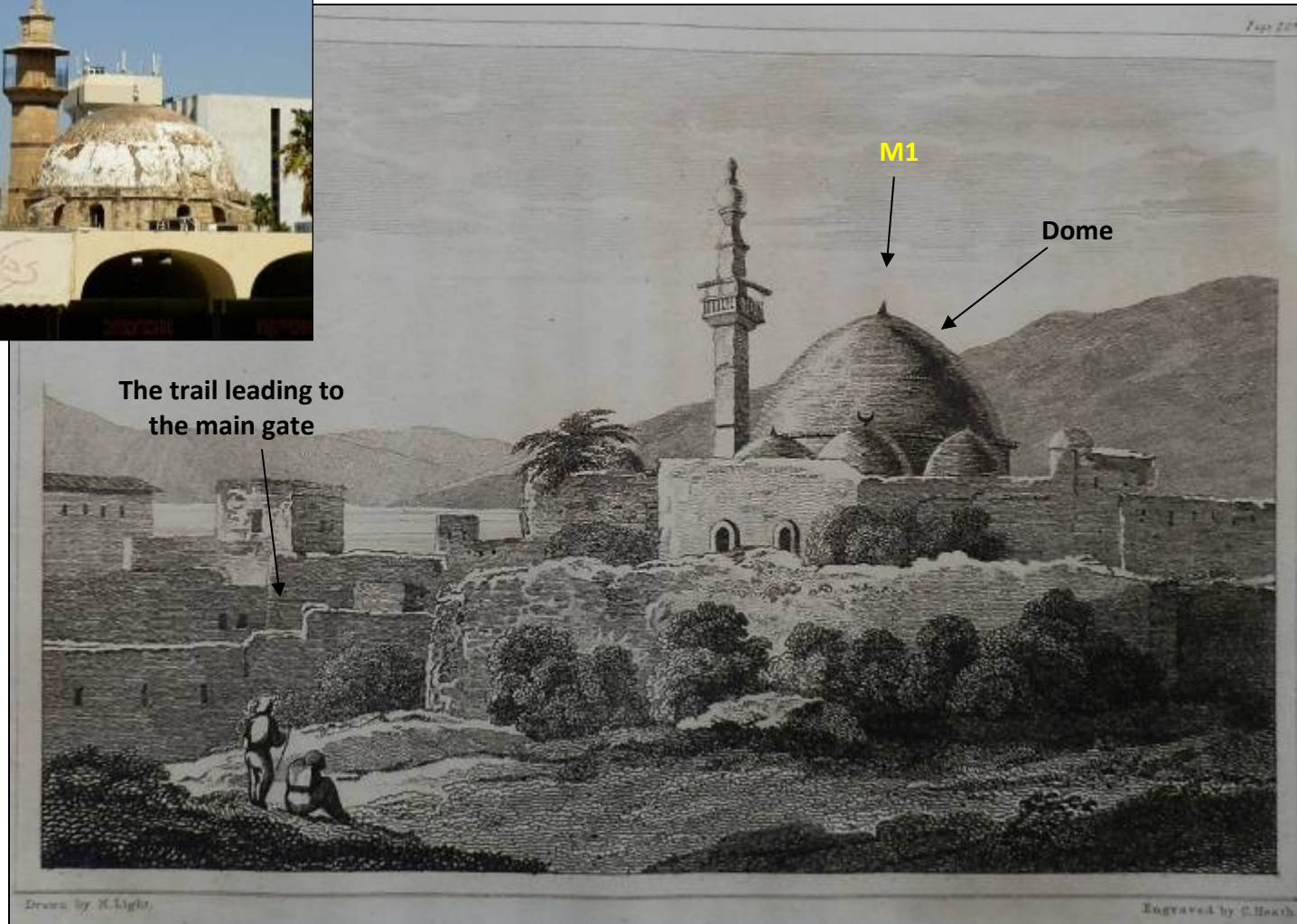


2. **1799:** Tiberias at the end of the 18<sup>th</sup> century as mapped by Jacotin for military purposes. Note the roads leading to the city and the fact that there is no road entering Tiberias from the north. See also the location of the main (G1) and southern (G2) gates (Jacotin, 1799)

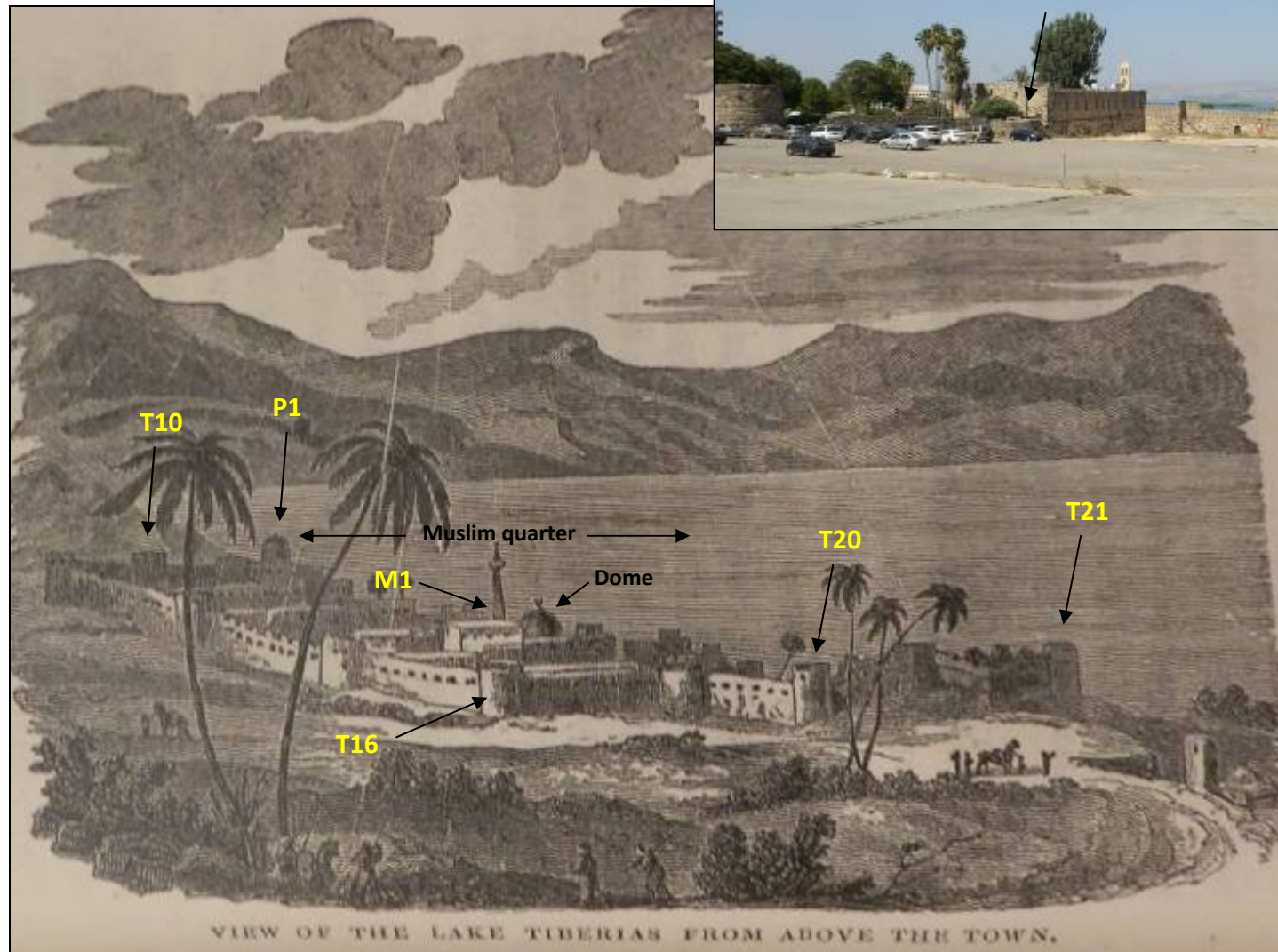


3. **1810-12:** Tiberias at the beginning of the 19<sup>th</sup> century (in brackets - identification according to Table 3): (a) the town gate [the western gate, G1]; (b) the Seraiah or palace of the Musellim [the citadel, P1]; (c) the mosque [al-Zaydani mosque, M1]; (d) the Catholic church [St. Peter church, C1]; (e) the gate of the Jewish quarter [JG1] ; (f) a mosque [probably al-Bahri mosque, M2]; (g) a range of large vaults [P8] ; (h) a small town-gate now walled up [the southern gate, G2]; and (i) newly built bazaar [P7] (Burckhardt, 1822). Note that Burckhardt confuses the number of turrets (counts 25 instead of 21) and neglects a northern turret (T1)

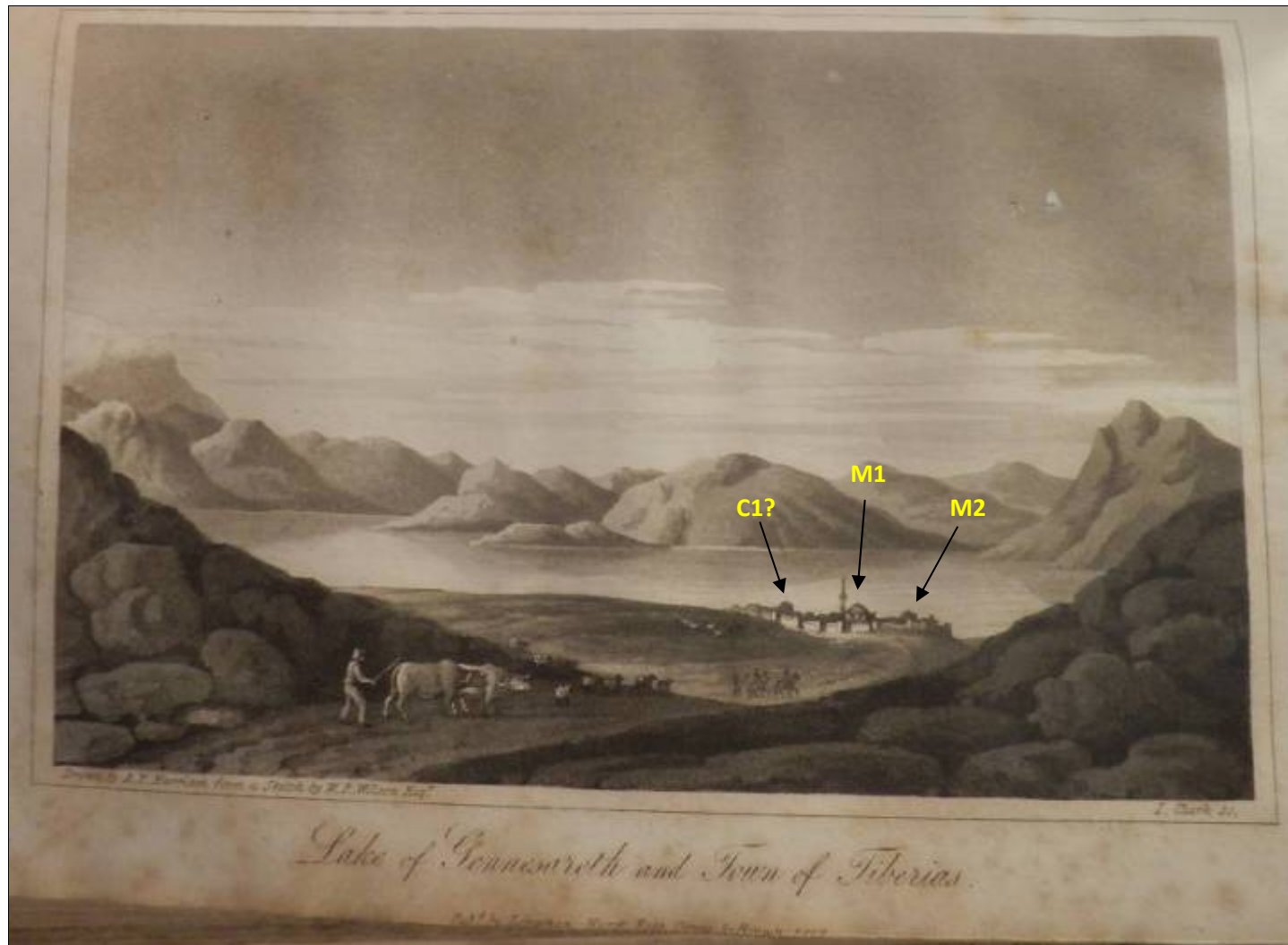




4. **1814:** al-Zaydani mosque drawn from close range within the city itself (Light, 1818). Note the relatively large dome also present in other pre-1837 drawings (e.g., Buckingham, 1822; Marilhat in de Laborde, 1837; Wilson, 1823).

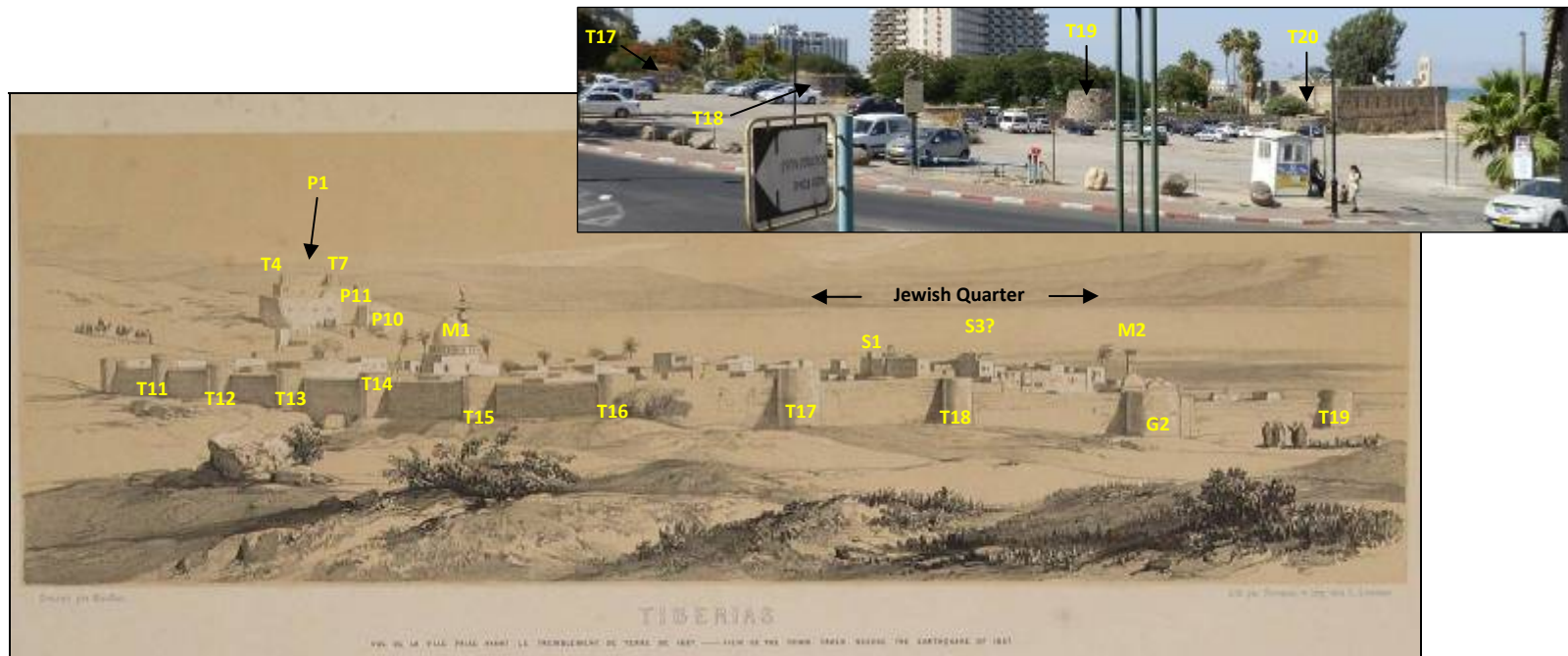


5. **1816:** Buckingham draws the citadel (P1) as having only one turret but the other turrets (e.g., T10, T16, T20, T21) seems to be drawn correctly. Note the al-Zaydani mosque (M1) (Buckingham, 1822).

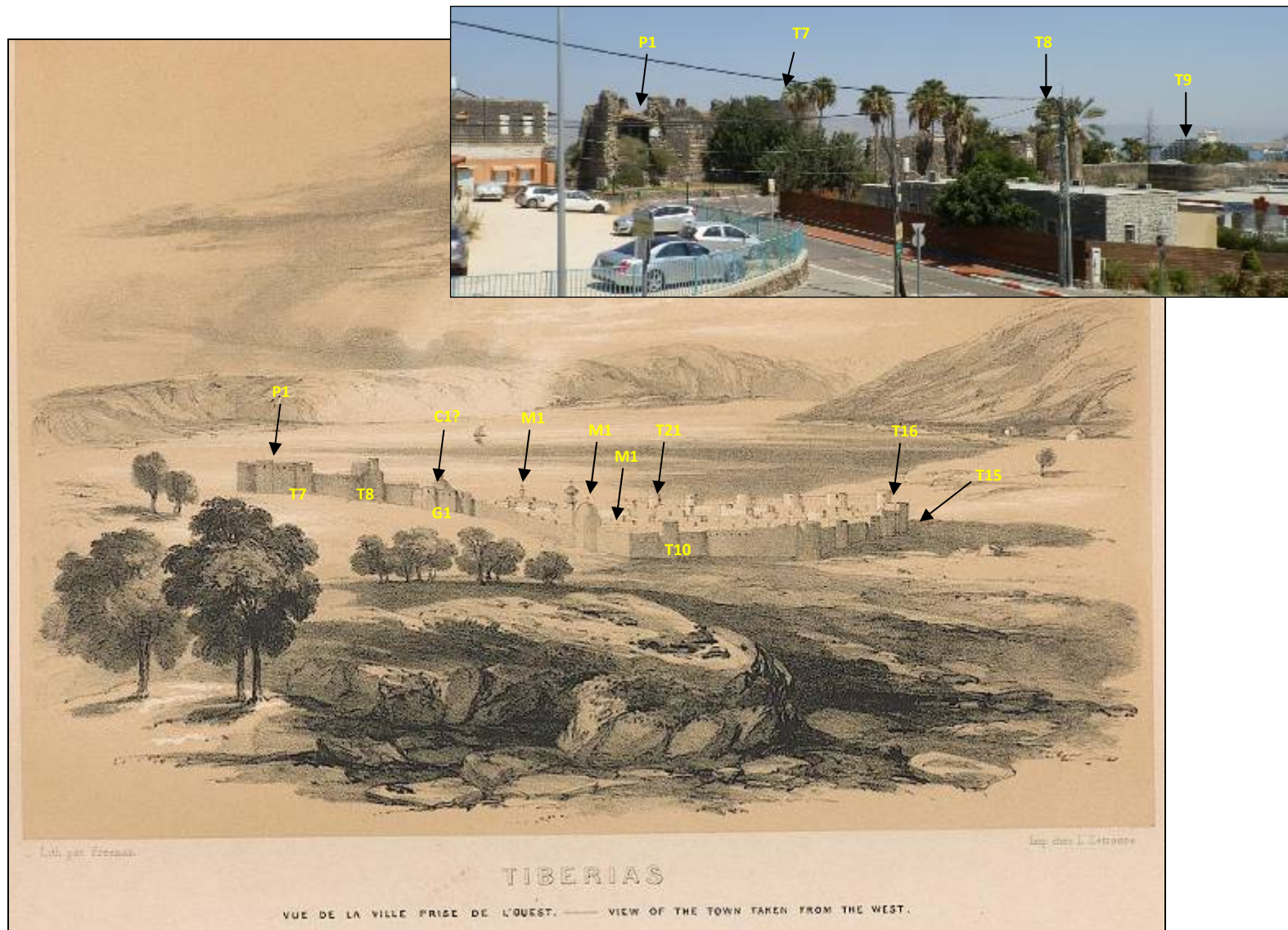


6. **1822:** al-Zaydani (M1) and al-Bahri (M2) mosques. The minaret of al-Zaydani is portrayed relatively high above the dome. Note the possible identification of St. Peter church (C1) (Wilson, 1823).



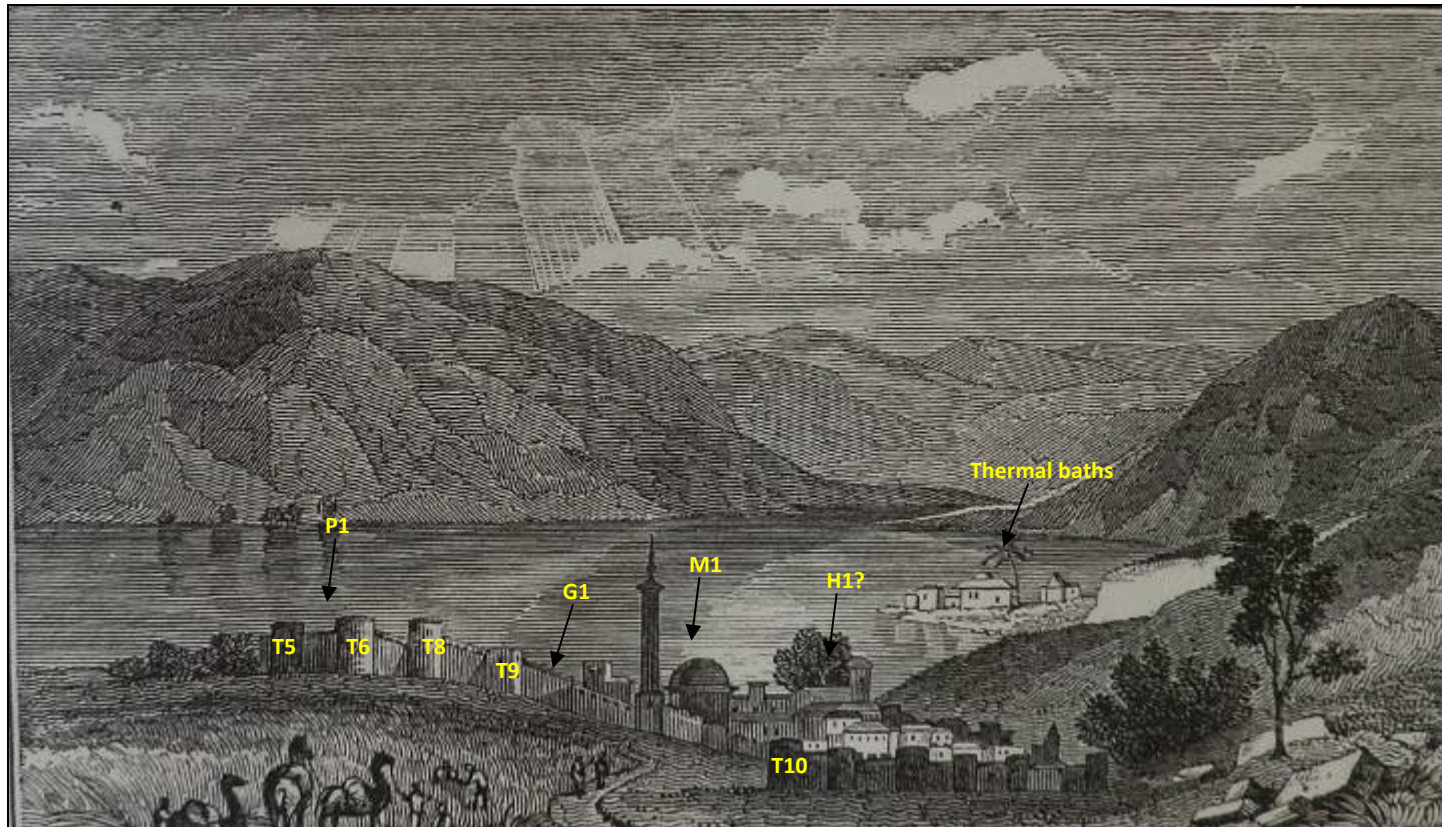


7. **1828:** Tiberias from the south in the book of Leon de Laborde. The latter visited Palestine in 1828 but his book on Syria, Lebanon and Palestine was published only in 1837. The book contains also other artist's drawings. This drawing was drawn by Marilhat and considered realistic. For example, the number of turrets and location of the citadel are accurate in light of our current knowledge of the Tiberias morphology (Marilhat in de Laborde, 1837)

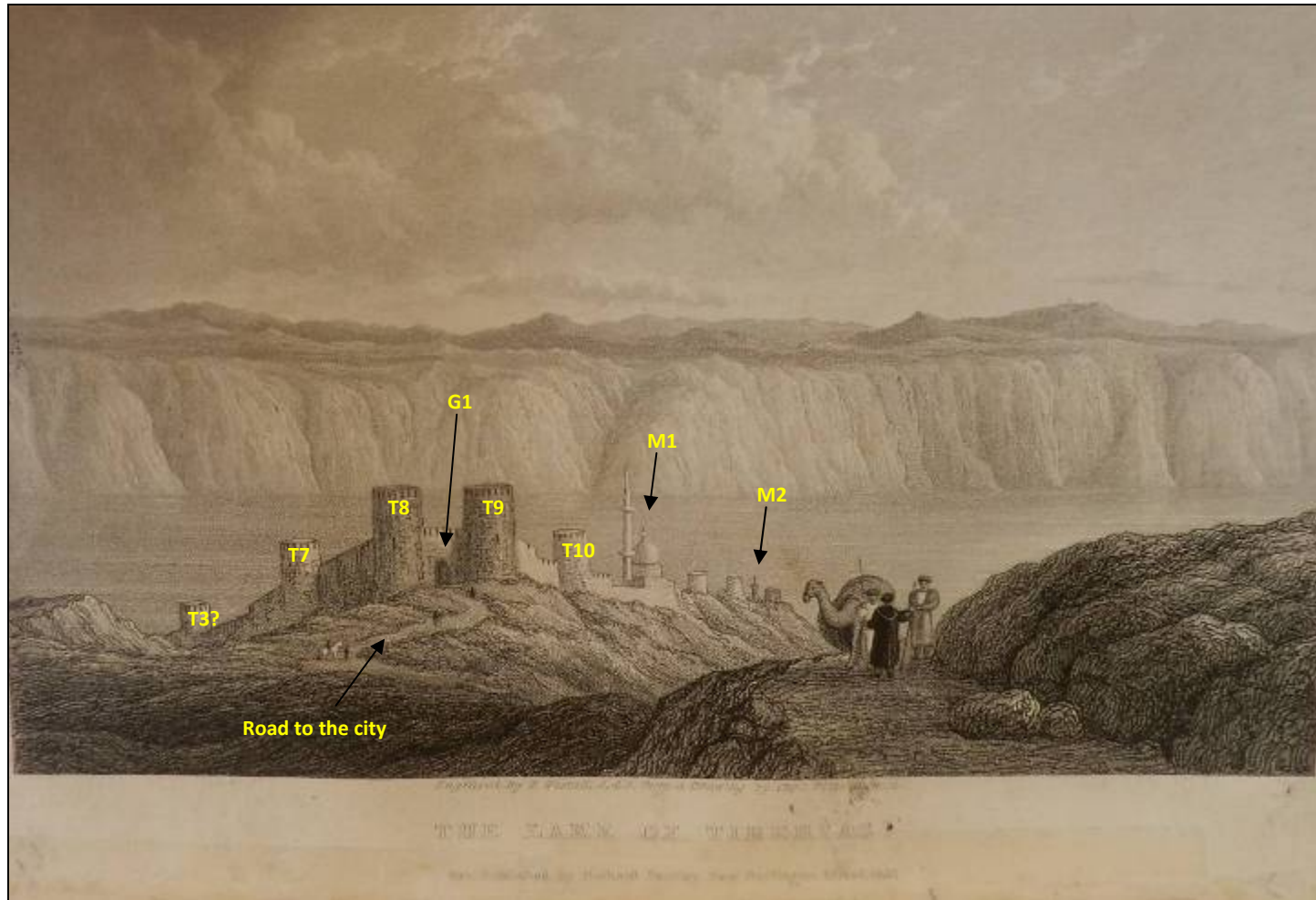


8. **1828:** Tiberias from the west (de Laborde, 1837). Note the accuracy in counting the turrets: six (T16-T21) at the south of the city and six (T10-T15) at its western side.

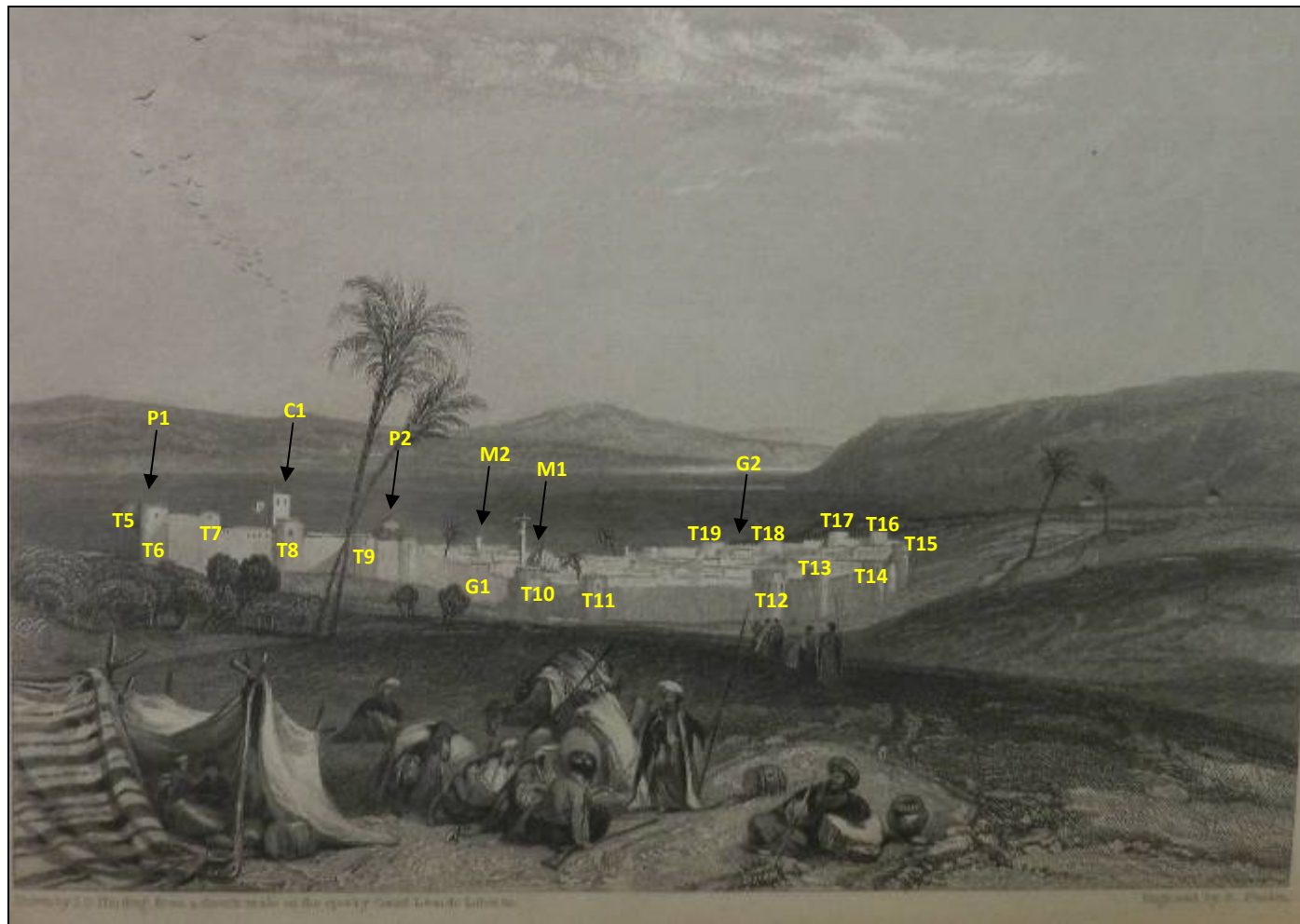




9. **1832:** The city drawn from the north (Russell, 1832).



**10. 1833:** Sketch of Tiberias drawn from northeast of the city. Despite the exaggerated topography one can detect prominent features, e.g., the western main gate (G1) and the surrounding turrets. Note that two minarets appear, probably of the al-Zaydani (M1) and al-Bahri (M2) mosques (Skinner, 1836).

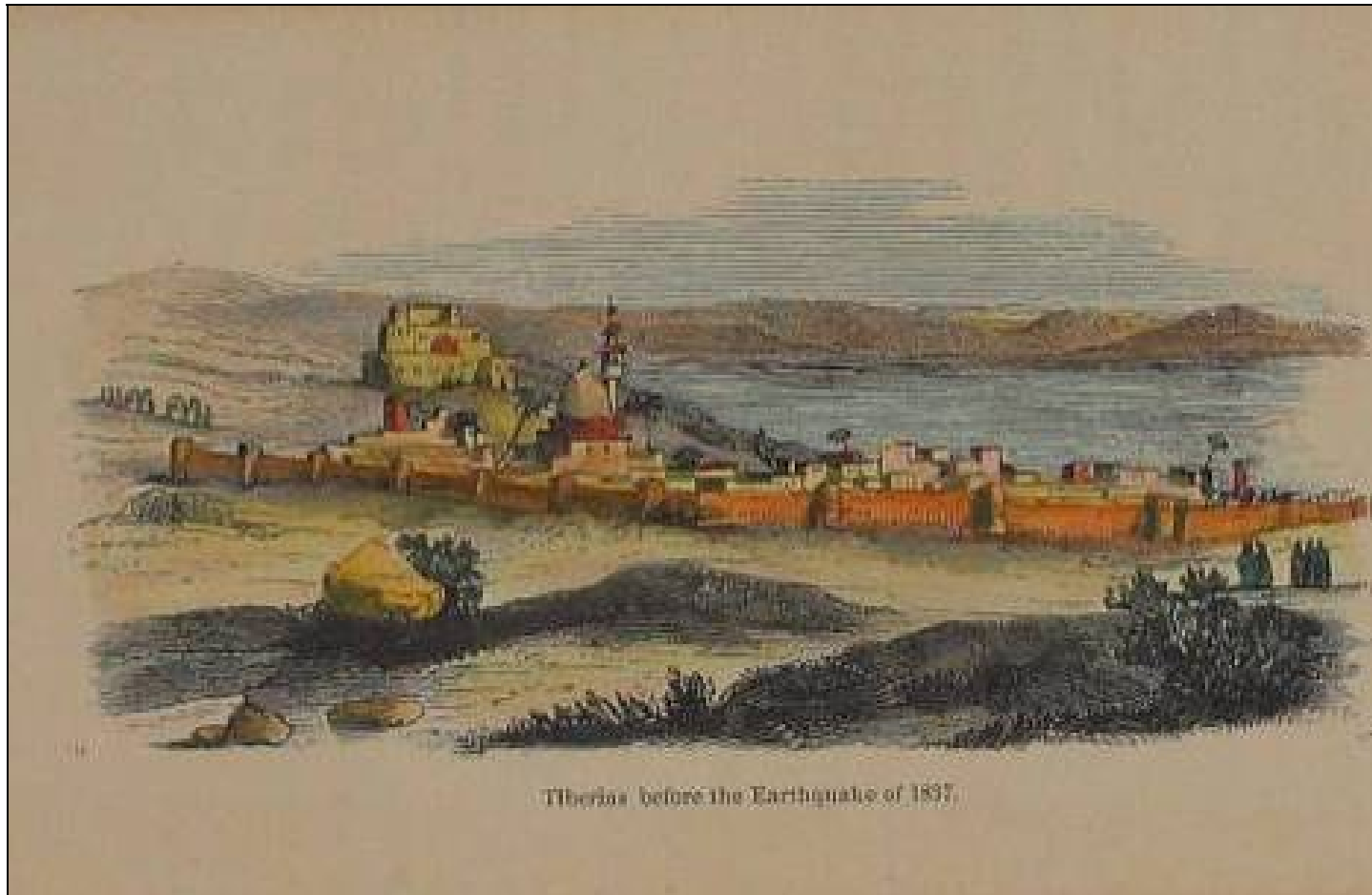


**11. 1835:** The town from the north. Note the turrets and the two minarets of al-Zaydani and al-Bahri mosques (Harding, 1835). The drawing was probably copied from the drawing of Marilhat (in de Laborde, 1837).





**12. Prior to 1837 (1835?):** Tiberias and the Sea of Galilee. No significant identification of features (Thomas Allom in Carne, 1838).

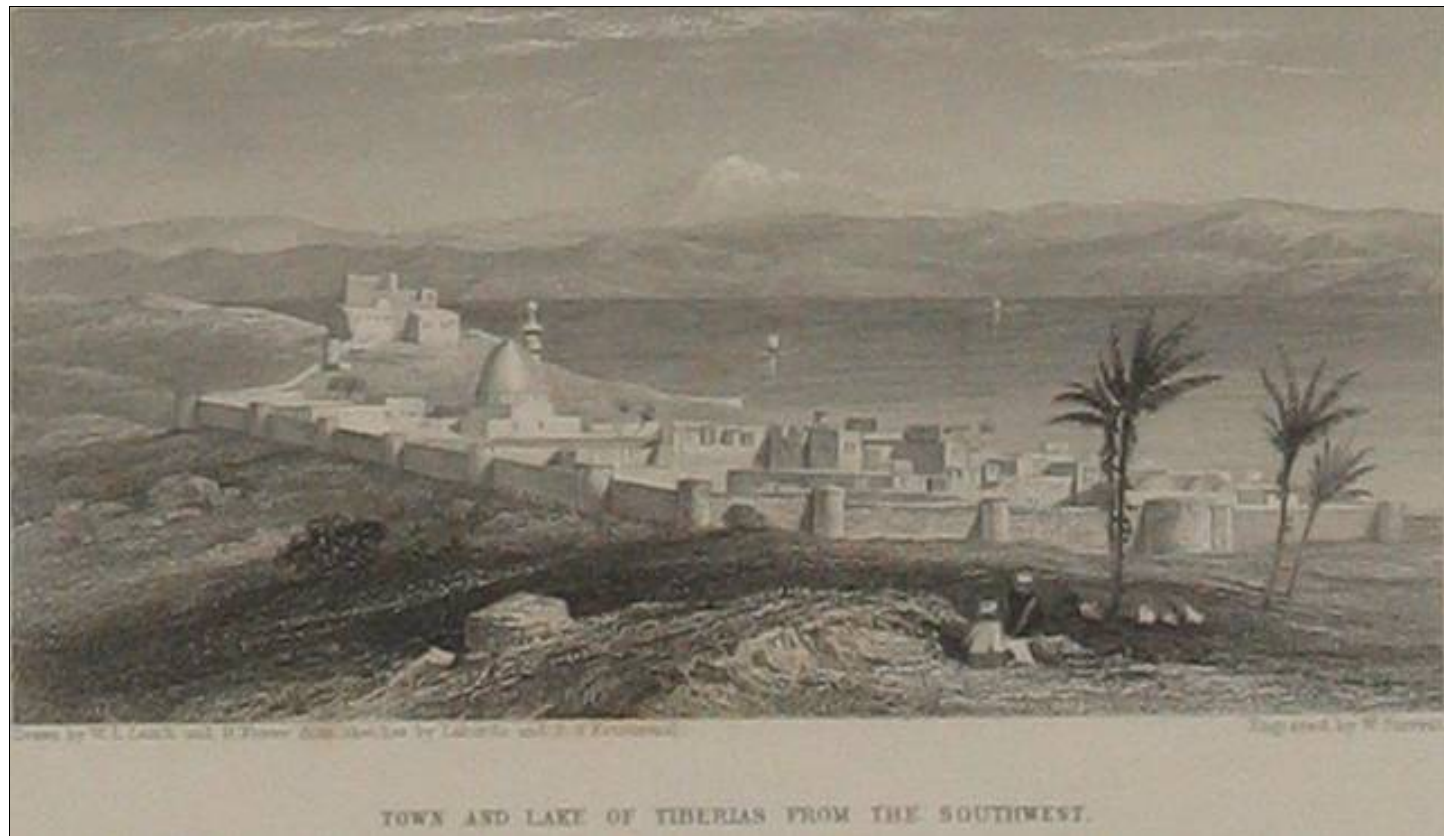


- 13. Prior to 1837:** Tiberias from the south (Lindsay, 1858). The drawing portrays Tiberias prior to the earthquake but the date is unresolved. The drawing appears only in the 5<sup>th</sup> edition of the book of Lord Lindsay published in 1858. However, Lindsay visited Palestine only after the earthquake, in 1837 and 1847. Thus, in my opinion, it was copied from a previous drawing, perhaps from Marilhat (de Laborde, 1837).



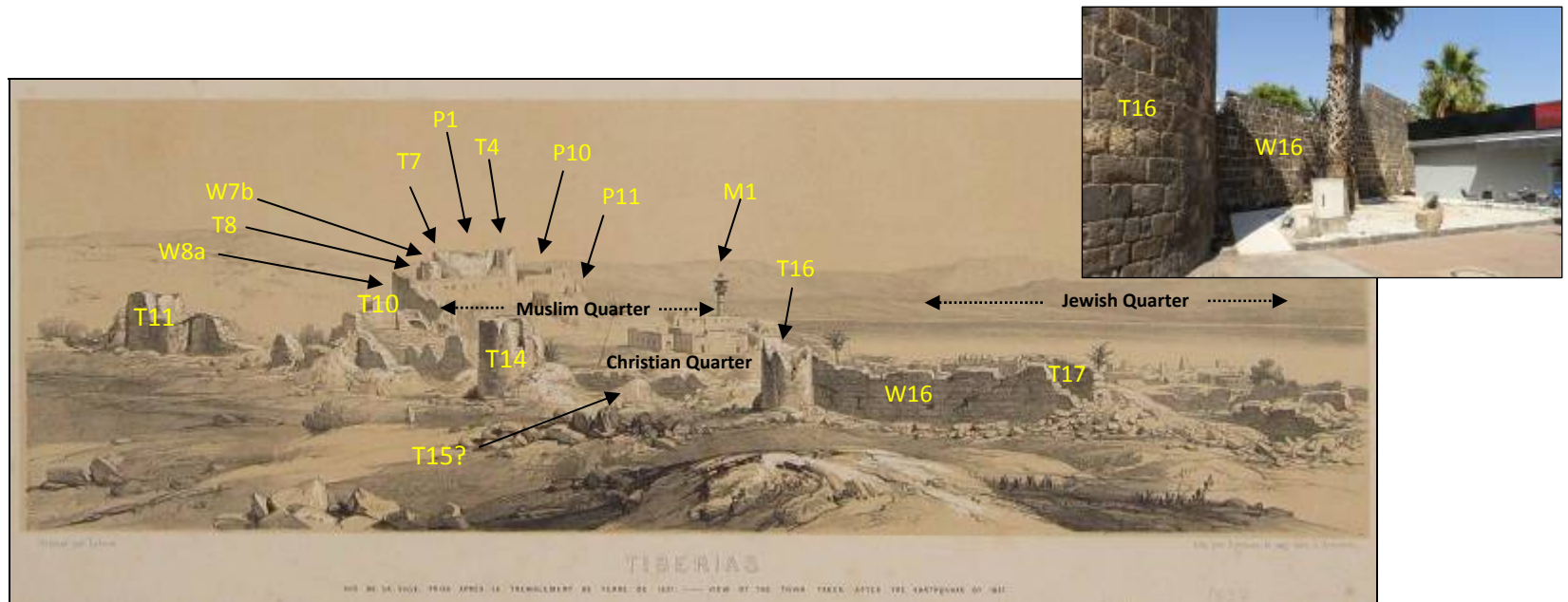
**14. Prior to 1837:** Tiberias from the north (Leitch & Foster, 1855). In my opinion, this is probably a copy of the sketch after Marilhat (de Laborde, 1837).





15. **Prior to 1837:** Tiberias from the south (Leitch & Foster, 1855). In my opinion, this is probably a copy of the sketch after Marilhat (de Laborde, 1837).

## Sources describing Tiberias after the earthquake

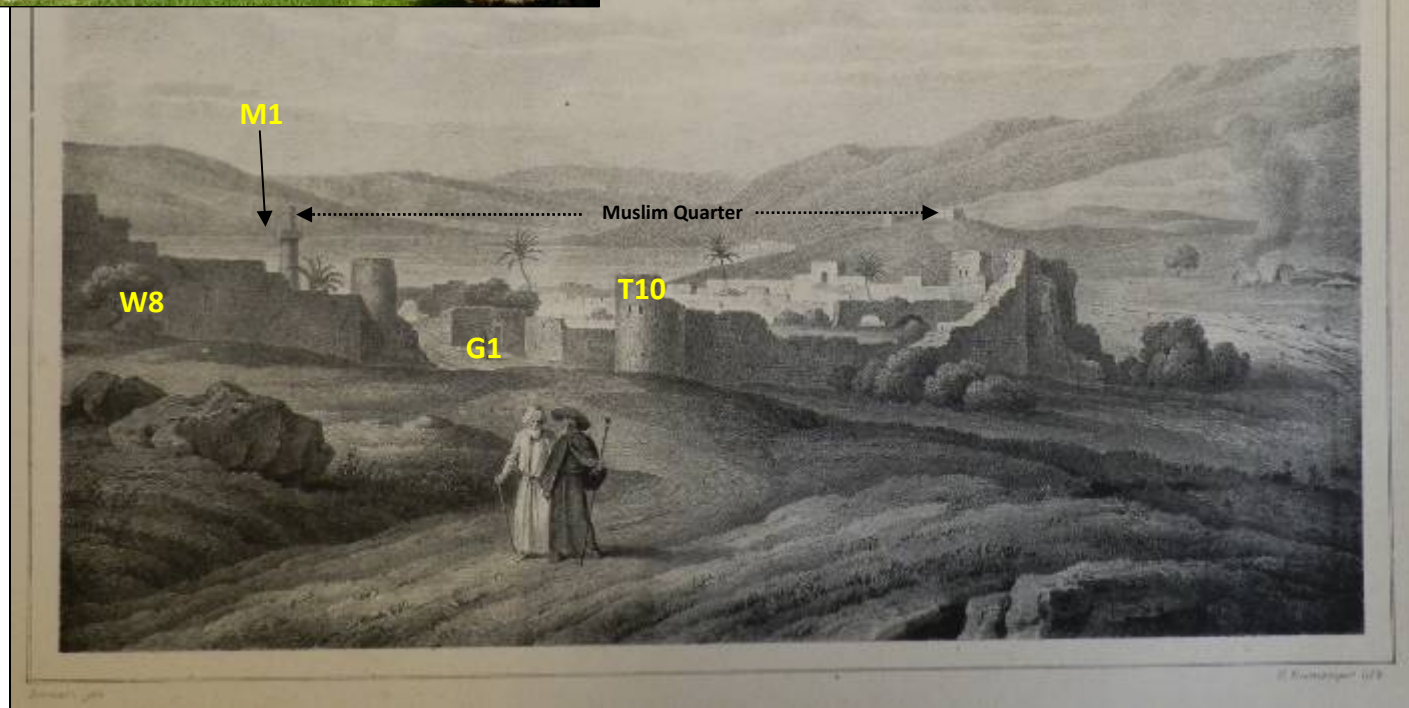
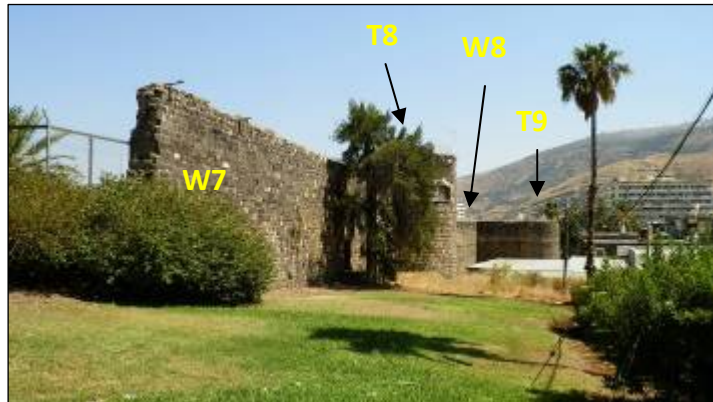


- 16. 1837:** Tiberias after the earthquake drawn from the south. Note the damage to the citadel (P1), to the walls and to its turrets (T4-T17). The Jewish quarter is depicted as partially destroyed while in the Muslim and Christian quarters there are hardly any standing dwellings. The drawing seems to be realistic: parts of the walls (e.g., W7b, W8a, and W16) and turrets (e.g., T8, T10 and T16) that were drawn as not destroyed still exist till today (Lehoux in de Laborde, 1837).

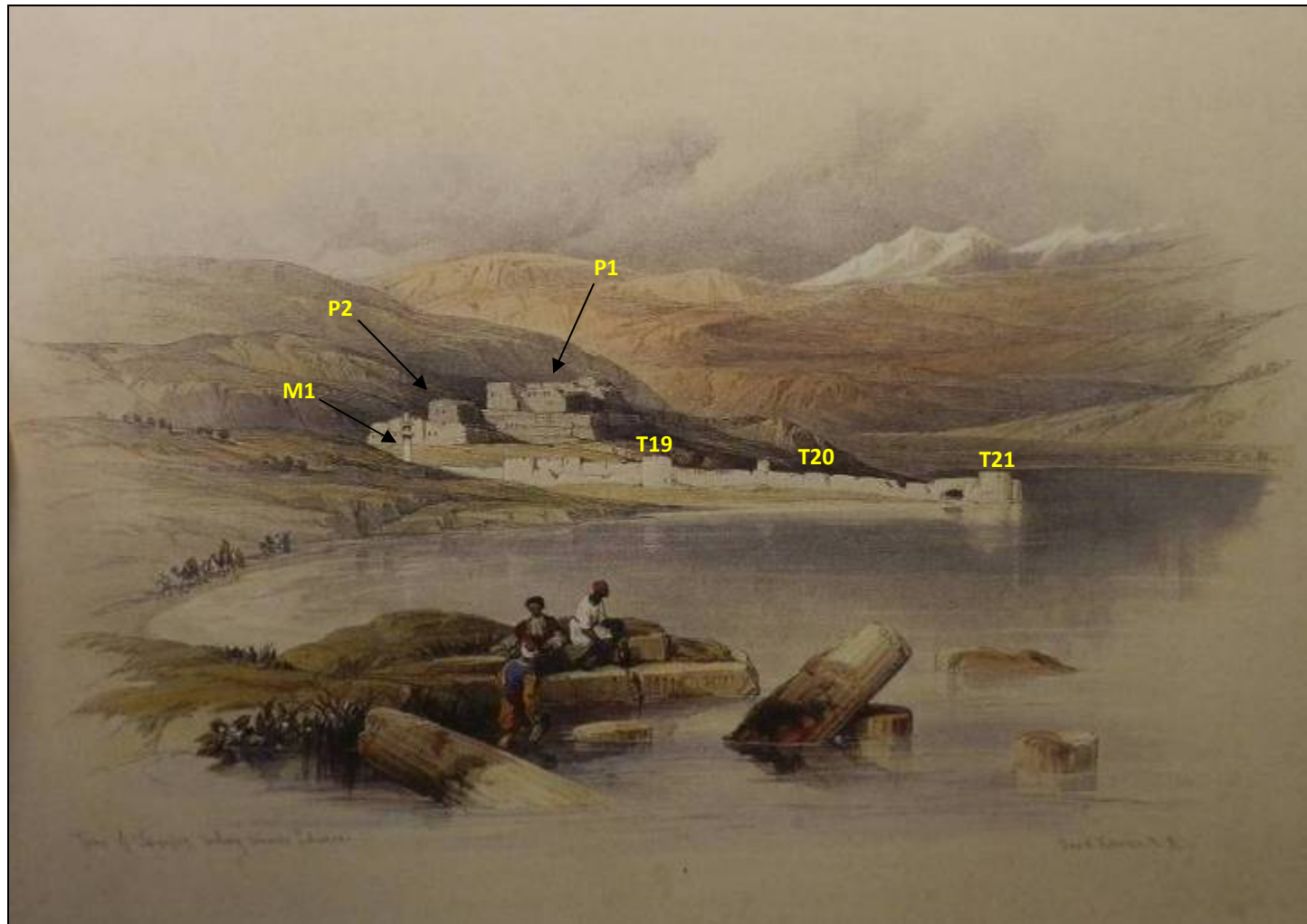


- 17. After 1837:** The drawing portrays Tiberias prior to the earthquake but the date of painting is unresolved. It appears only in the 5<sup>th</sup> edition of Lindsay (1858). Lindsay visited Palestine twice and only after the earthquake (1837 and 1847) and thus, in my opinion, the drawing is a copy of a previous one, perhaps of Lehoux (de Laborde, 1837)





**18. 1837:** Tiberias from the north, after the voyage of Bernatz and Schubert (Bernatz & Schubert, 1839). The drawing seems to be realistic as prominent features (e.g., W8 and T10) are depicted in similar shape and size as they are today.



**19. 1839a:** Damage to the citadel and walls. Note the completeness of the Seraiah (P2) and the presence of the minaret of al-Zaydani mosque (M1) (Roberts, 1842-1849).



**20. 1839b:** Tiberias from the south. Note the arched vaults (P8), al-Zaydani mosque and minaret but no dome, the ruined citadel (P1), the Seraiah (P2), a Synagogue (Etz Hayim?, S1), turret T1 in the water, and St. Peter church (Roberts, 1842-1849).

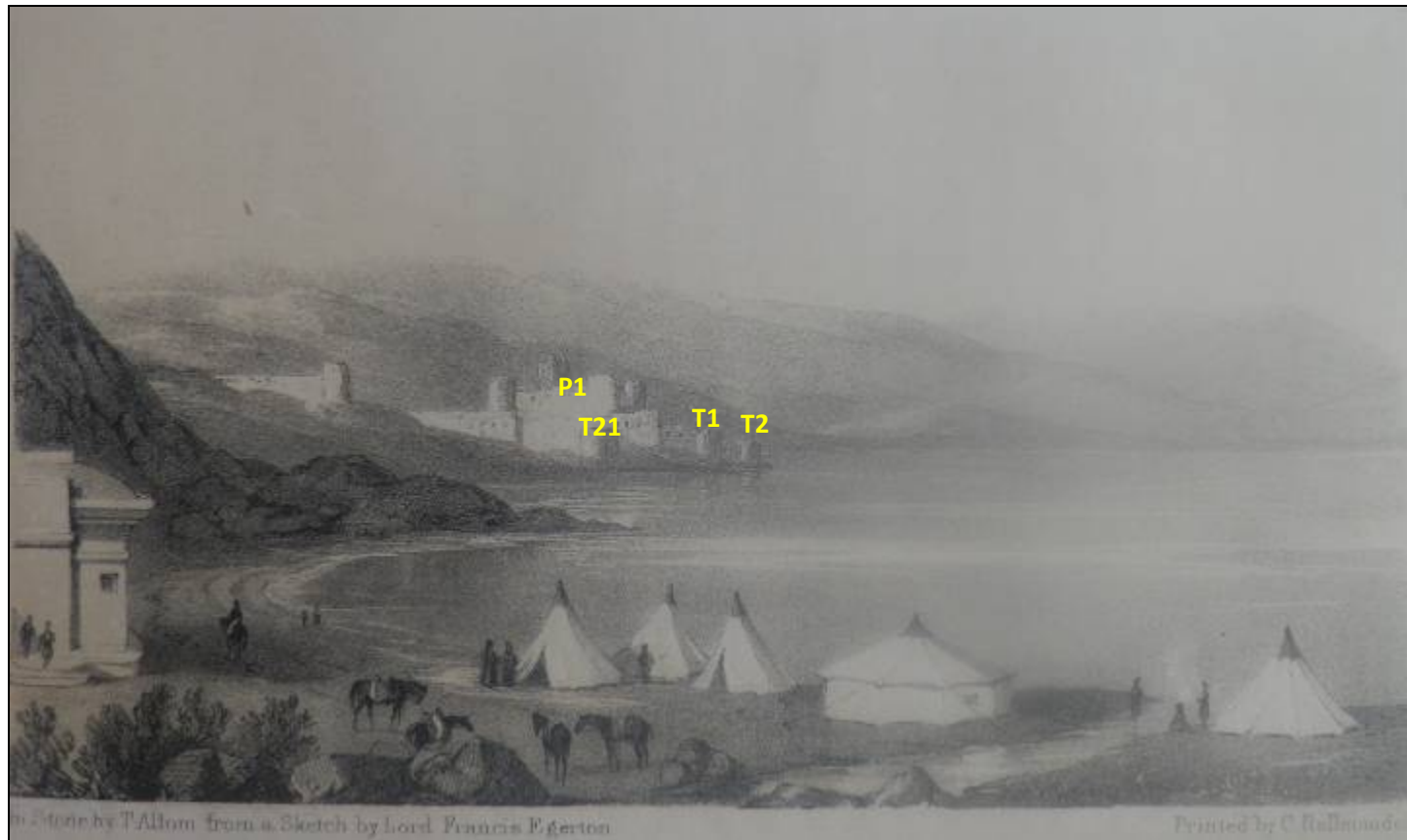




**21. 1839c:** The western walls are drawn as partially ruined (Roberts, 1842-1849).

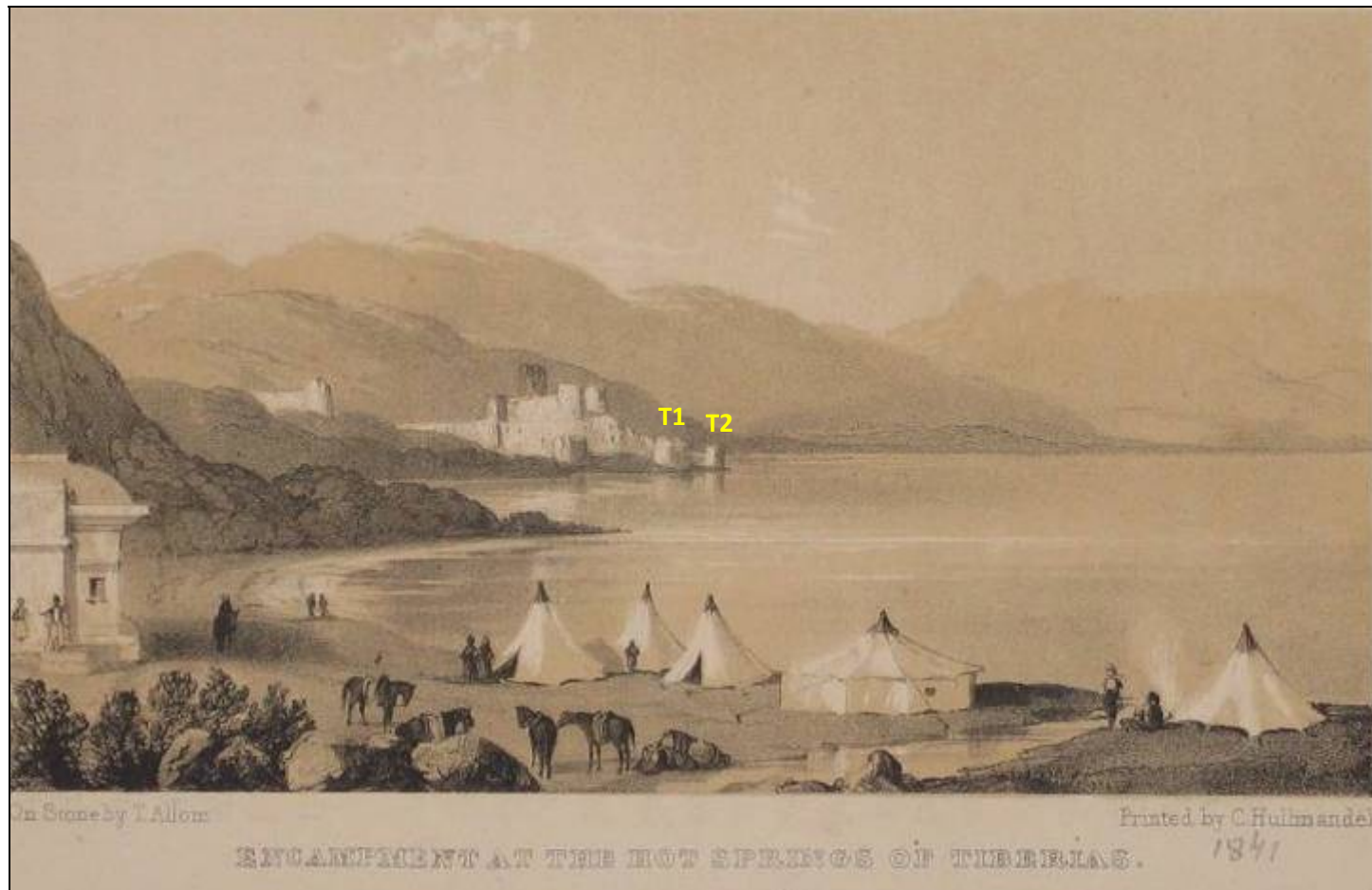


**22. 1839d:** The citadel (P1) is depicted partially ruined; the Seraiah (P2); the walls that are partially ruined, al-Zaydani mosque without a dome (Roberts, 1842-1849). Note turret T21 leaning towards the east and its lower supporting belt (noted by red arrow).

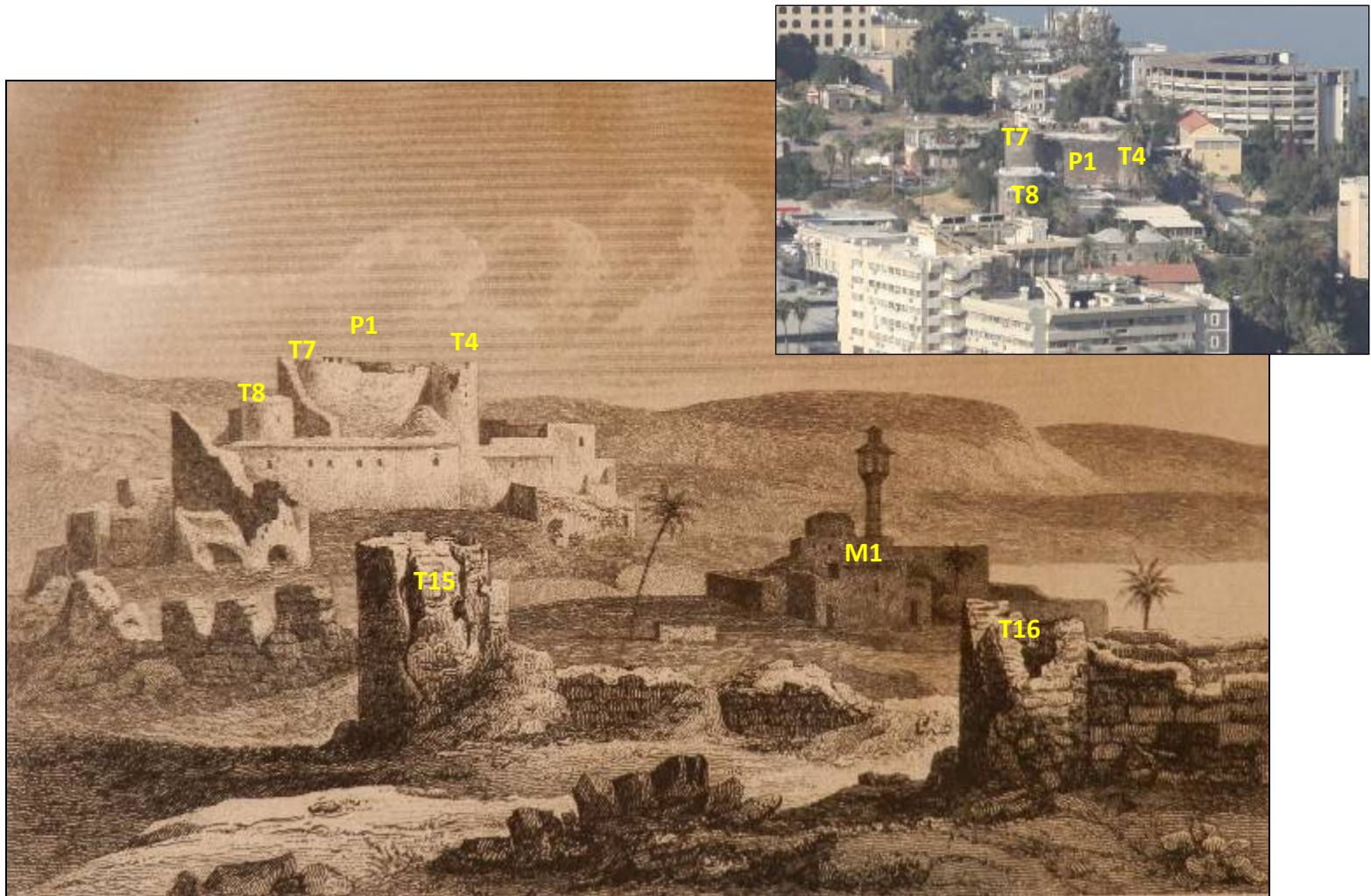


**23. 1840:** Tiberias from the south, probably from a spot close to the thermal baths. The depiction of the city is vague but one can detect the citadel (P1) drawn as slightly damaged and few turrets (T1, T2 and T21) (Egerton, 1841)

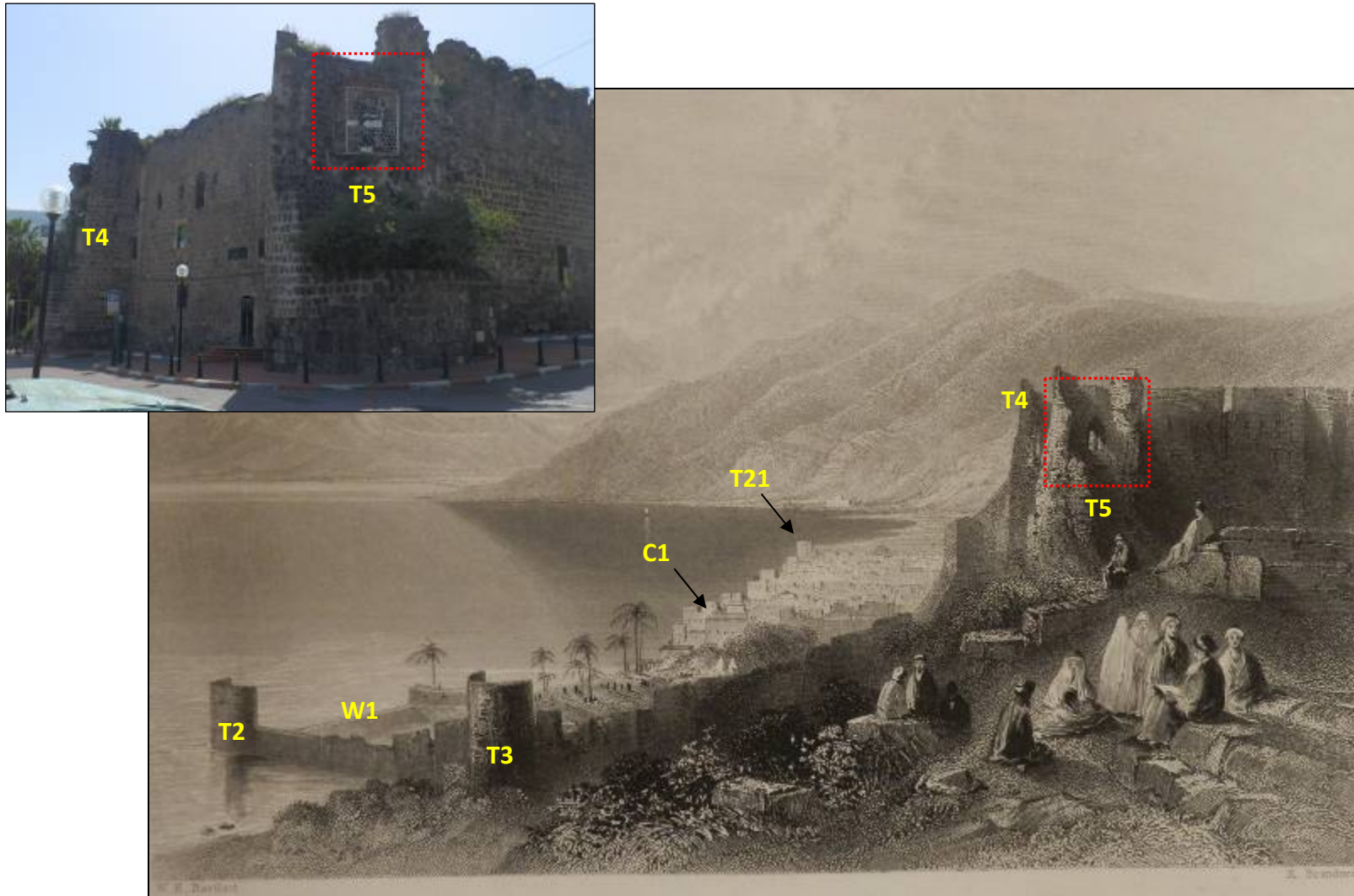




**24. 1841:** Tiberias from the south by Barnes (1841). Although few features are depicted differently, it seems that this drawing was copied from the drawing of Egerton (1841). Yet, note that in this drawing the lean of T1 and T2 is clearly seen.



**25. 1841:** Ruins of Tiberias. The citadel (P1) is depicted as slightly damaged (Munk, 1845).



**26. 1842a:** Tiberias and its citadel in a drawing drawn from the north (Bartlett in Stebbing, 1847). Note the similarity of T4 and T5 to their recent state (upper left corner) and the accuracy of the hatch (red square) as drawn by Bartlett.





**27. 1842b:** Tiberias drawn from the thermal baths. Note the four turrets that erect above the others (probably ruined) and remains of damaged walls (Bartlett in Stebbing, 1847).

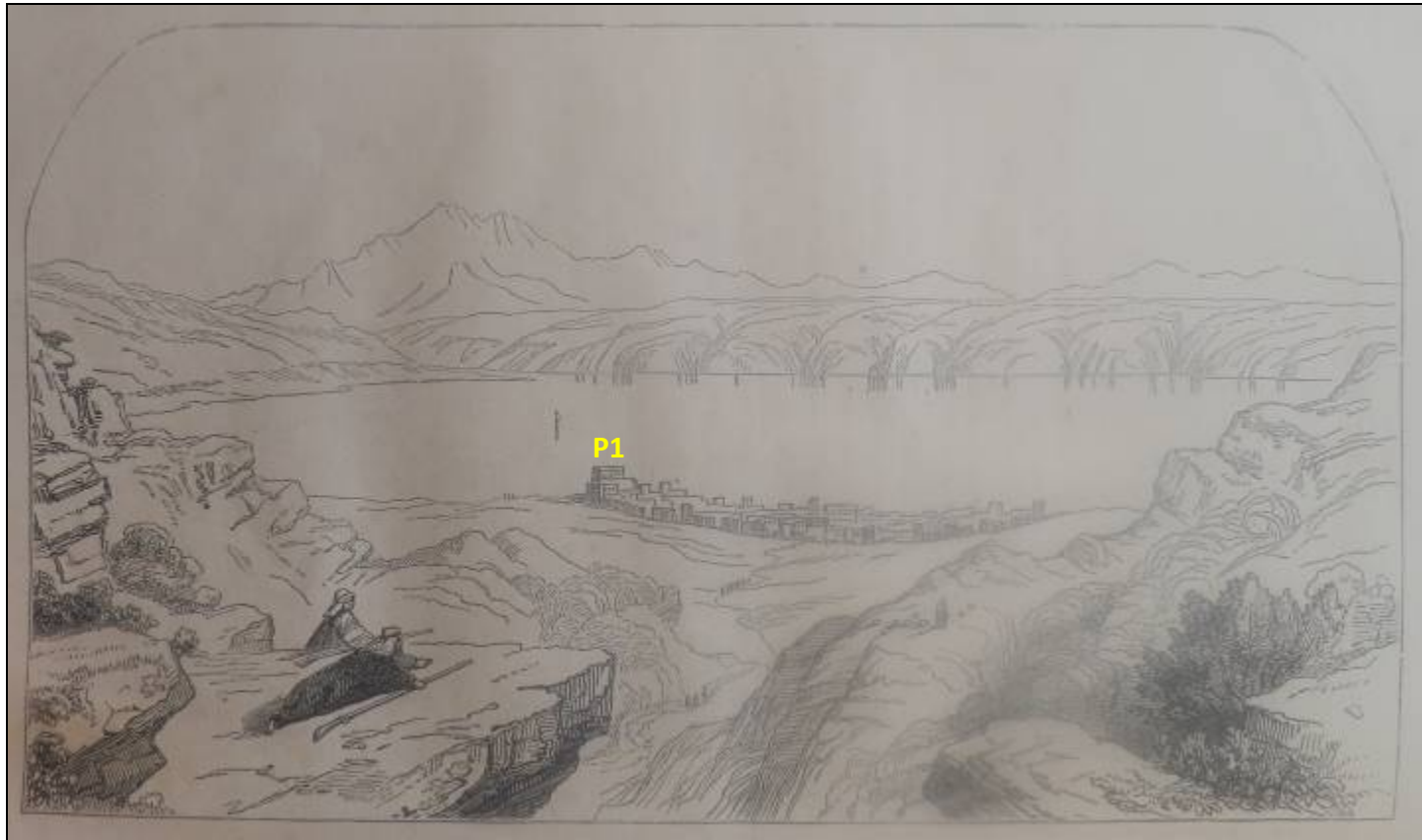


**28. 1842c:** Tiberias from the west. Several turrets seem to be relatively higher than the others and in the western walls large breaches appear (Bartlett in Stebbing, 1847).

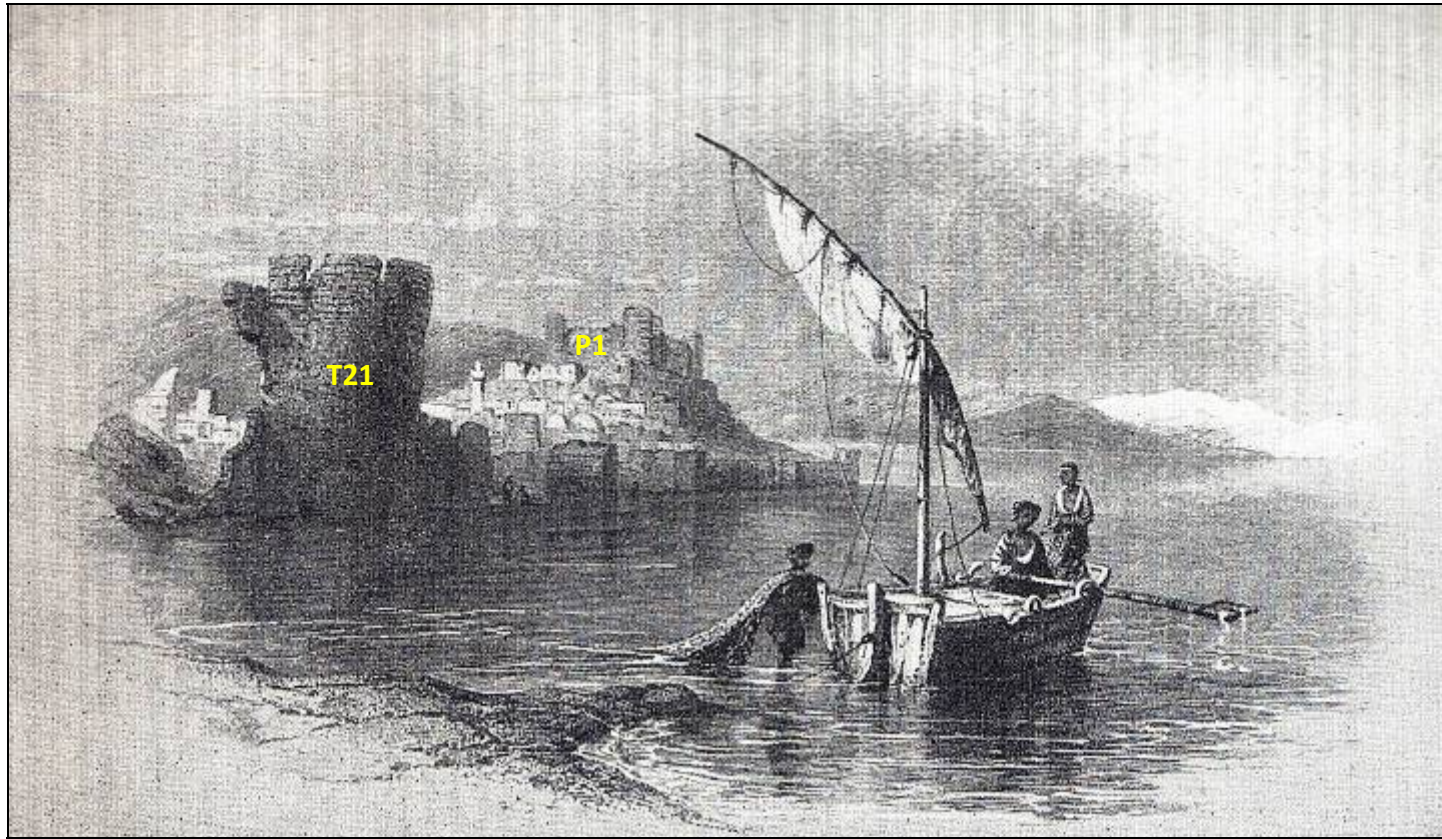


**29. 1842d:** Tiberias view drawn from the citadel of Safed. Note the citadel of Tiberias (P1) (Bartlett in Stebbing, 1847).





**30. 1842e:** sketch of Tiberias from the west. Large breaches appear in the western and southern walls of the city (Bartlett, 1850).



**31. 1842f:** the leaning turret (T21) and the citadel (P1) (Bartlett, 1850).



**32. 1848:** Tiberias from the north, probably drawn somewhere on the hill of the citadel (Lynch, 1849). Prominent features: the vaulted St. Peter church (C1); Etz-Hayim synagogue (S1); al-Zaydani mosque (M1); Menahem Mendel synagogue (S3); House of Zee'v Woolf (J1) and western damaged walls.





**33. 1849:** the road from Safed leading to Tiberias, the citadel and the walls (Spencer, 1850).



**34. 1851:** The citadel of Tiberias from the north (Schulz, 1852). One can observe a trail leading from the shore of the lake of Galilee into the city.

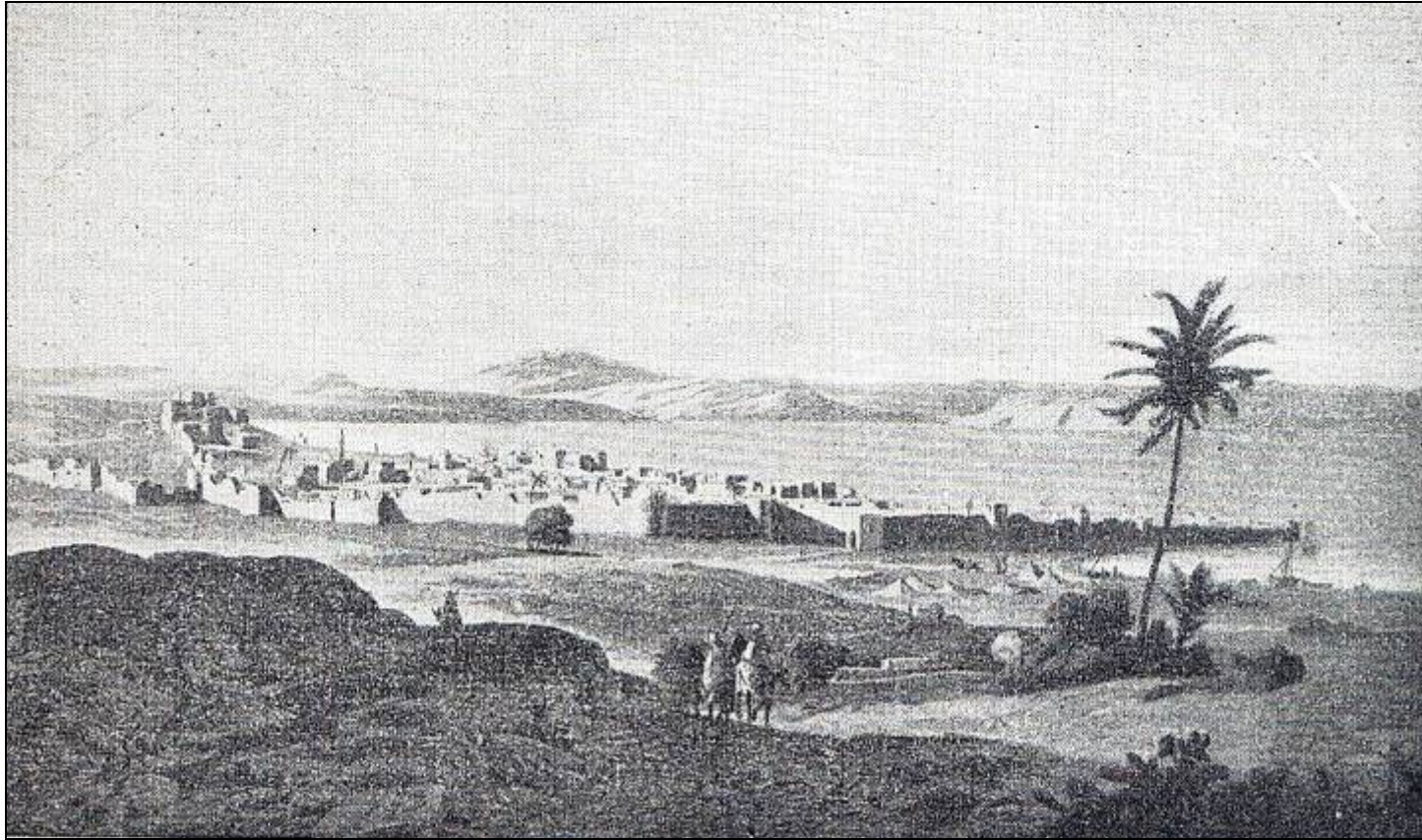


**35. 1851-52:** Tiberias from the south (Van de Velde, 1857).





36. 1856 (?): the region surrounding the Sea of Galilee (Robinson & Smith, 1856)



**37. 1860:** Tiberias from the south (Strauss, 1861).





**38. 1863:** Tiberias from the western road leading to the main gate. Note the possible identification of turret T17 (Unknown, 1867). In my opinion the drawing was copied from Munk (1845).

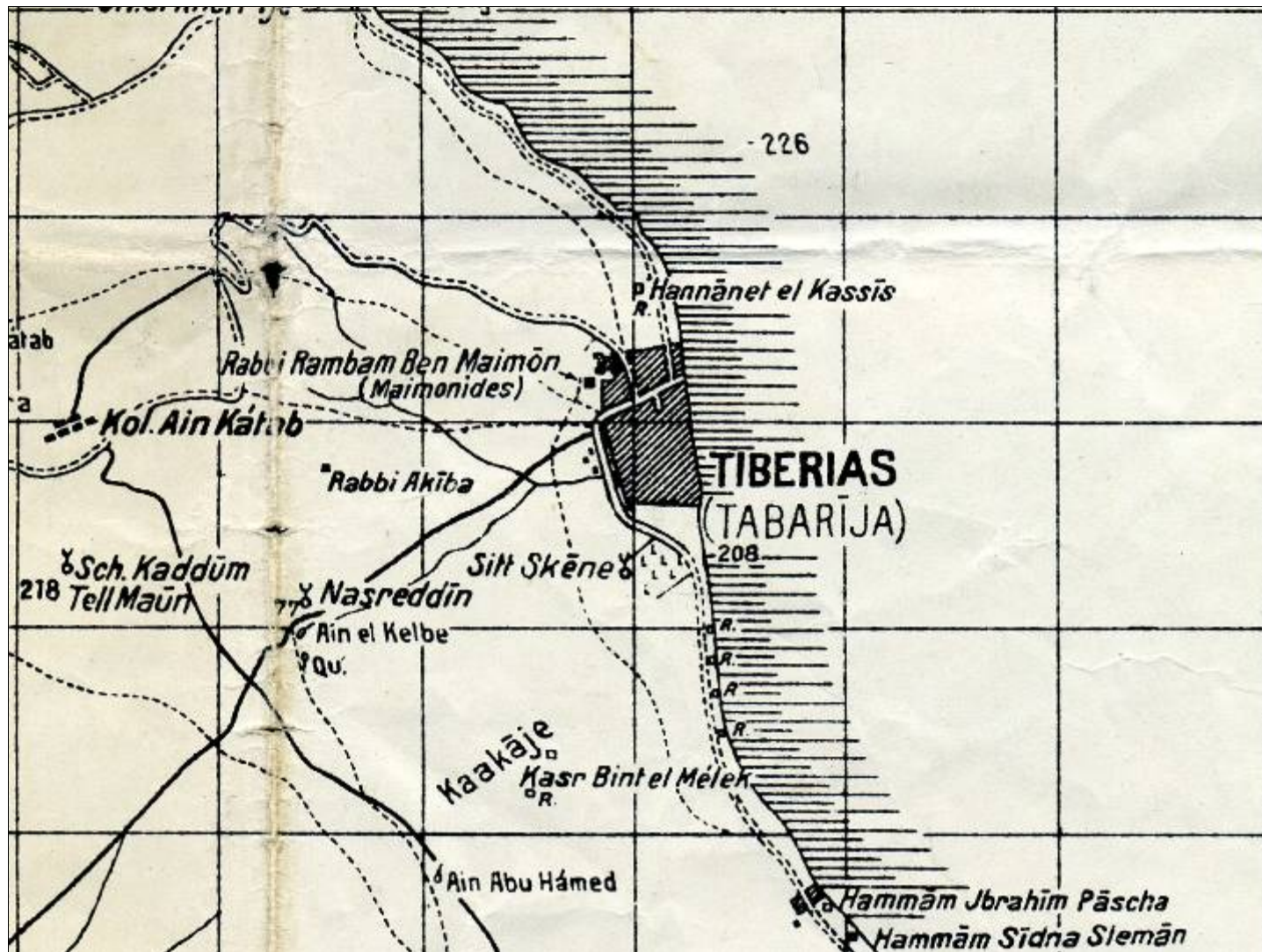




**39. c.1870:** a photograph probably taken from the hill of the citadel (Bonfils, 1878?). The northern region was not populated. No minaret of al-Bahri mosque, no dome to al-Zaydani.



40. 1880: Map of the Sea of Galilee and Tiberias (Lvov, 1880).



41. 1880: Tiberias and its close vicinity (PEF, 1918).





42. 1885 (?): Tiberias towards the end of the 19<sup>th</sup> century (Frei, 1885).

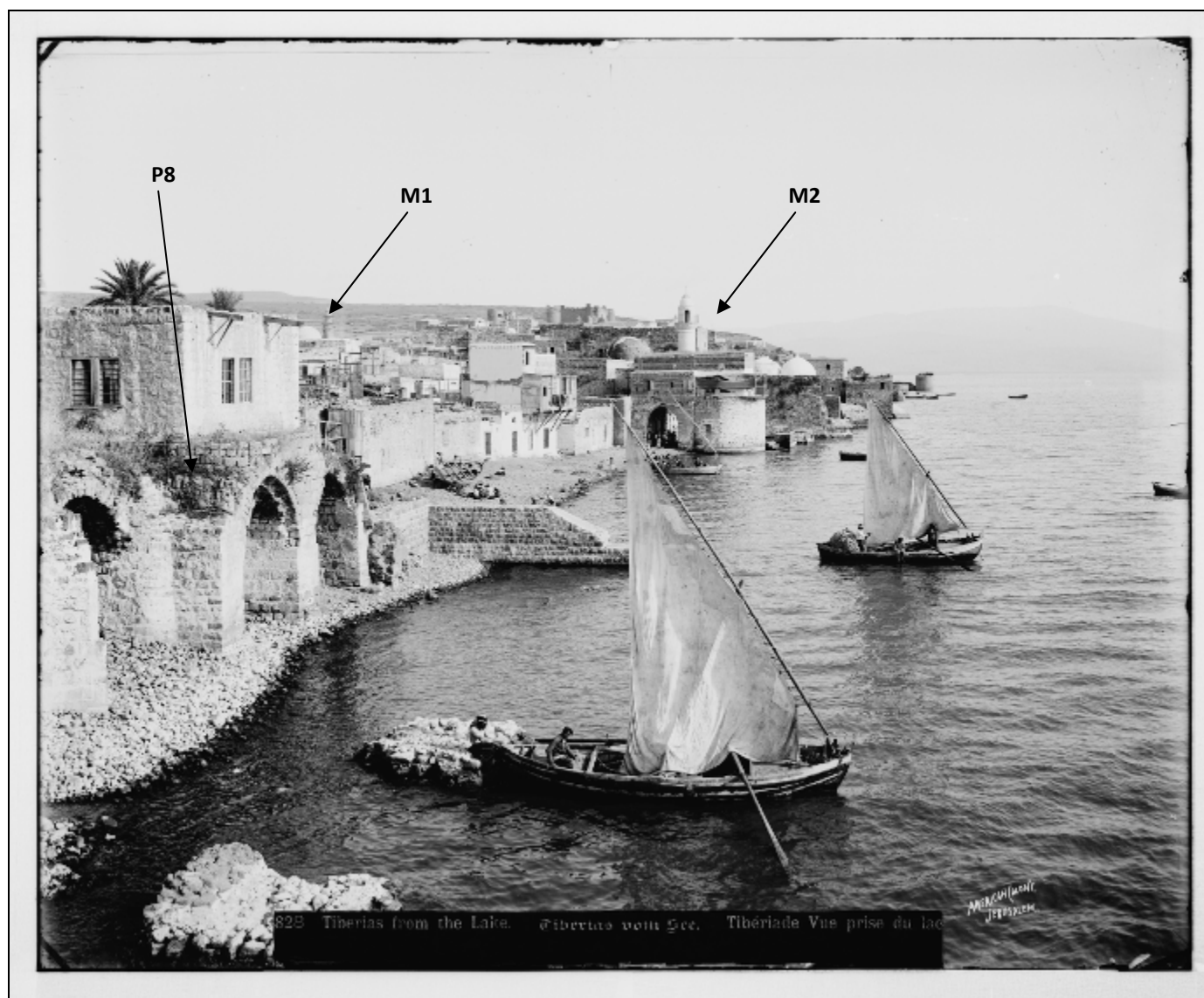


43. 1900-1920: (ACPD, 1900-1920).



- 44. 1898-1914:** (ACPD, 1898-1914a): large breaches in the western walls, similar to the drawings of Lehoux 1837 (item 16). Note the new dome of al-Zaydani mosque (M1) and that there is no minaret to al-Bahri mosque. Turrets T16-T17 marks the transitions between unharmed and harmed part of the southern wall. A southern road entering the city, probably an expansion of a large breach in the walls, is clearly observed.





45. 1898-1914: (ACPD, 1898-1914b)

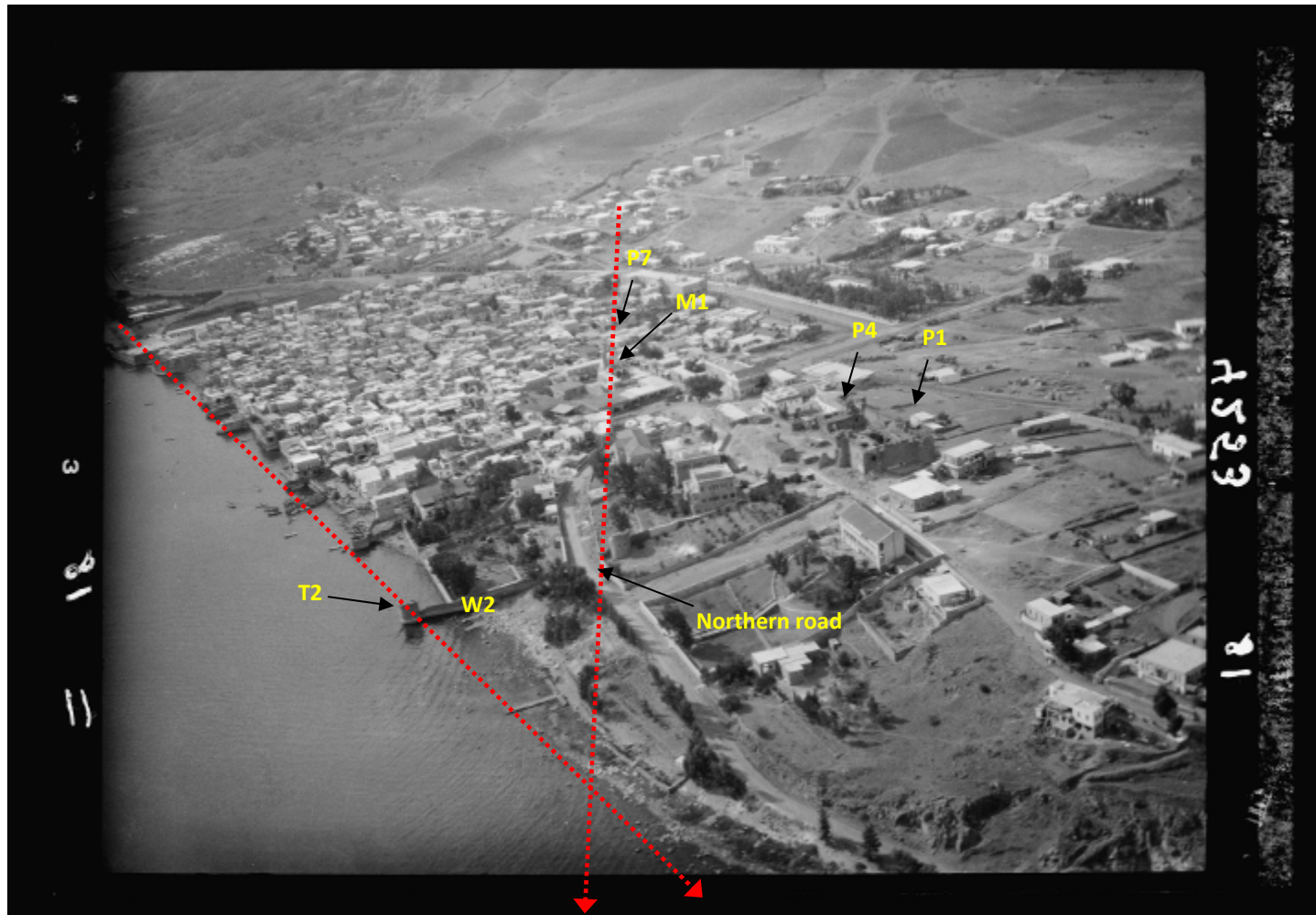


46. 1898-1946: (ACPD, 1898-1946b)



47. 1898-1946: (ACPD, 1898-1946a)

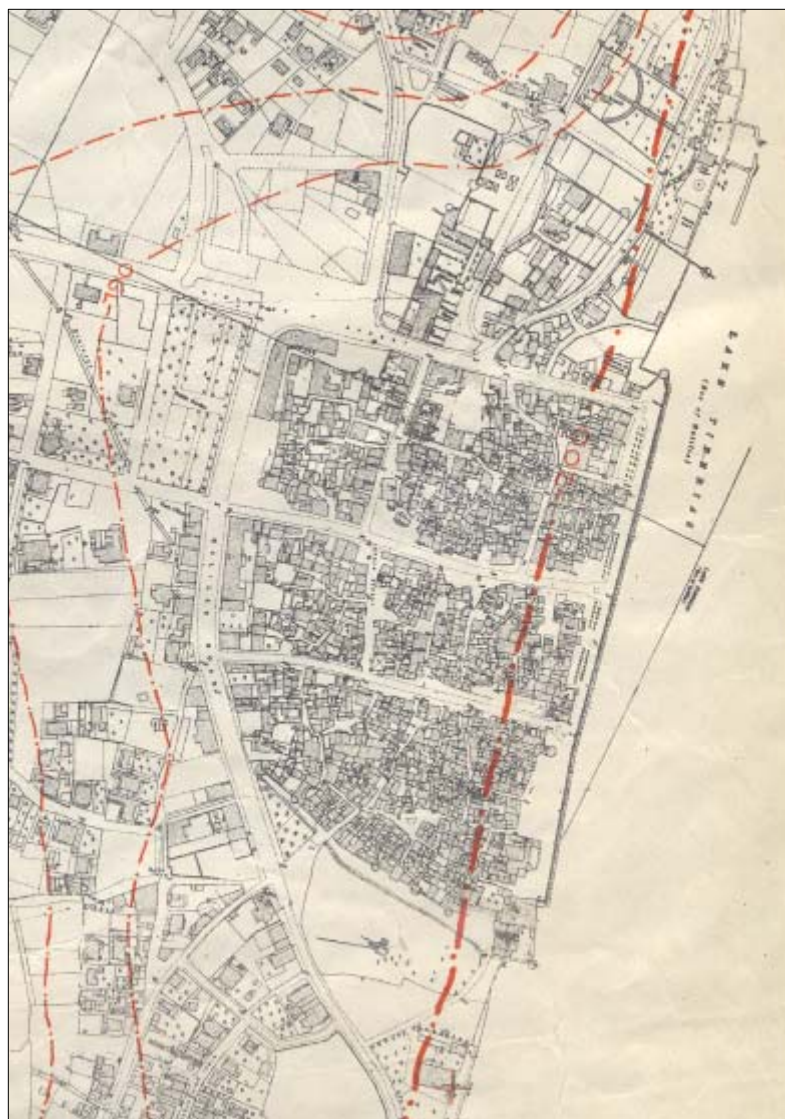




48. 1931: air photo of Tiberias taken from north of the city (ACPD, 1931a). The W2 part of the walls seems to be compatible with the drawing of Bartlett (item 26) and strengthens the claim that the northern parts of the walls were not affected significantly. Other breaches in the northern walls (E.g., the breach of the northern road to the city) might have been extended only after the event. The red dotted line assists in geo-tagging the location of the photographing camera/airplane (Fig. 3)



**49. 1931:** air photo of Tiberias taken south of the city (ACPD, 1931b). Note that some dwellings at the beginning of the 20<sup>th</sup> century were built on top of existing turrets (e.g., T19 and T20). The red dotted line assists in geo-tagging the location of the photographing camera/airplane (Fig. 3)



**50. 1938:** British map of Survey of Palestine, 1938 (Survey of Palestine, 1938).



## REFERENCES

- ACPD. (1898-1914a). Northern views. General view of Tiberias (Tabariyeh). In LC-DIG-matpc-07009 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1898-1914b). Northern views. Tiberias from the lake. In LC-DIG-matpc-07012 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1898-1946a). Tiberias. In LC-DIG-matpc-08965 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1898-1946b). Tiberias. In LC-DIG-matpc-08964 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1900-1920). Series of first aerial photographs of Palestine and Syria. Tiberias from 1000 m. In LC-DIG-matpc-05596 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1931a). Air views of Palestine. Tiberias looking south over suburbs on north shore. In LC-DIG-matpc-15820 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA*. Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- ACPD. (1931b). Air views of Palestine. Tiberias. View toward the north coast. Foothills south of Tiberias in foreground. In LC-DIG-matpc-22081 (Ed.), *Library of Congress Prints and Photographs Division Washington, D.C. 20540 USA* (Vol. 1 negative : glass, dry plate ; 4 x 5 in. or smaller.). Jerusalem: G. Eric and Edith Matson Photograph Collection, Library of Congress, Prints & Photographs Division.
- Barnes. (1841). Encampment at the Hot Springs of Tiberias, on stone by Allom, T., the National Maritime Museum.
- Bartlett, W. H. (1850). *A Pilgrimage Through the Holy Land: Explanatory of the Diorama of Jerusalem and the Holy Land*. London: Publisher not identified.
- Bernatz, J. M., & Schubert, G. H. (1839). *Afbeeldingen van het Heilige Land, Bestaande uit Veertig Gezigten van Belangrijke Plaatsen, in de Heilige Schrift Vermeld*. Amsterdam: Johannes Muller.
- Bonfils, F. (1878?). *51 photographs of Palestine*. Alais?: Publisher not identified.
- Buckingham, J. S. (1822). *Travels in Palestine Through the Countries of Bashan and Gilead* (Vol. 2). London: Longman, Hurst, Rees, Orme, and Brown.

Burckhardt, L. J. (1822). *Travels in Syria and the Holy Land*. London: J. Murray.

Carne, J. (1838). *Syria, the Holy Land & Asia Minor Illustrated* (Vol. 3). London: Fisher, Son, & Co.

de-Bruyn, C. (1702). *A Voyage to the Levant: or, Travels in the Principal Parts of Asia Minor, the Islands of Scio, Rhodes, Cyprus, & c. .* London: Printed for Jacob Tonson and Thomas Bennet.

de Laborde, L. M. (1837). *Voyage de la Syrie*. Paris: Firmin Didot, Freres Editeurs.

Egerton, F. (1841). *Journal of a Tour in the Holy Land, in May and June 1840*. London: Harrison and Co.

Frei, A. (1885). Tiberias. *Zeitschrift des Deutschen Palästina-Vereins*, 4.

Harding, J. D. (1835). *The Biblical Keepsake, or, Landscape Illustrations of the most Remarkable Places Mentioned in the Holy Scriptures* (Vol. 2). London: John Murray.

Jacotin, P. (Cartographer). (1799). Carte topographique de l'Egypte et de plusieurs parties des pays limitrophes... Construite par M. Jacotin.

Leitch, W. L., & Foster, B. (1855). Tiberias (pp. Engraved by W.Forrest after pictures by W.L.Leitch and B.Foster, published in a bible about 1855. Multi-view steel engraved print with recent hand colour). The National Maritime Museum.

Light, H. (1818). *Travels in Egypt, Nubia, Holy Land, Mount Lebanon and Cyprus in the Year 1814*. London: Printed for Rodwell and Martin.

Lindsay, A. W. C. (1858). *Letters on Egypt, Edom, and the Holy Land / by Lord Lindsay* (5 ed. Vol. 2). London: H. Colburn.

Lvov, P. (Cartographer). (1880). Map of Galilee, Military Russian Archive, collection 444, list no. 1, file no. 59.

Lynch, W. F. (1849). Narrative of the United States' expedition to the river Jordan and the Dead Sea / by W.F. Lynch, U.S.N., commander of the expedition with maps and numerous illustrations. *Narrative of the United States' expedition to the river Jordan and the Dead Sea*.

Munk, S. (1845). Palestine : Description géographique, historique, et archéologique / par S. Munk.

PEF (Cartographer). (1918). Palestine Exploration Fund Map Sheet 4.

Roberts, D. (1842-1849). *The Holy Land, Syria, Idumea, Arabia, Egypt & Nubia*. London: F. G. Moon.

Robinson, E., & Smith, E. (1856). *Biblical Researches in Palestine, and in the Adjacent Regions. A Journal of Travels in the Year 1838 & 1852* (Vol. 2). London: John Murray.

Russell, M. (1832). *Palestine or the Holy Land; from the Earliest Period to the Present Time*. Edinburgh: Oliver & Boyd, Tweeddale-Court.

Schulz, E. W. (1852). *Reise in das Gelobte Land*. Mülheim an der Ruhr F.H. Nieten.

Skinner, T. (1836). *Adventures During a Journey Overland to India by Way of Egypt, Syria, and the Holy Land* (Vol. 2). London: Richard Bentley, New Burlington Street.

Spencer, J. A. (1850). *The East : Sketches of Travels in Egypt and the Holy Land*. London: J. Murray.

Stebbing, H. (1847). *The Christian in Palestine*. London: George Virtue.

- Strauss, F. A. (1861). *Die Länder und Stätten der Heiligen Schrift / in ausgewählten Bildern mit erläuterndem Texte von Friedrich Adolph Strauss und Otto Strauss die Bilder sind nach Zeichnungen von Halbreiter, Bernaz u. a.* Stuttgart: J. G. Cotta.
- Survey of Palestine, Tiberias, 1:5000, 1938.
- Unknown. (1867). *Pictorial Journey through the Holy Land : or, Scenes in Palestine.* London: Religious Tract Society.
- Van de Velde, C. W. M. (1857). *Le pays d'Israël : collection de cent vues prises d'après nature dans la Syrie et la Palestine / par C. W. M. van de Velde ... pendant son voyage d'exploration géographique en 1851 et 1852.* Paris: J. Renouard.
- Wilson, W. R. (1823). *Travels in Egypt and the Holy Land.* London: Longman, Hurst, Rees, Orme, and Brown.