

# Use of archival aerial photographs for archaeological research in the Arabian Gulf

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## Summary

A valuable archaeological and historical resource is contained within recently declassified aerial imagery from the UK's Joint Aerial Reconnaissance Intelligence Centre (JARIC), now held at the National Collection of Aerial Photography in Edinburgh (NCAP). A project at UCL-Qatar has begun to exploit this to acquire and research the historical aerial photography of Qatar and the wider Gulf region. The JARIC collection, comprising perhaps as many as 25 million photographs from British intelligence sources in the twentieth century, mainly from Royal Air Force reconnaissance missions, is known to include large quantities of aerial photography from the Gulf that have never been seen outside intelligence circles, dating from 1939 to 1989. This paper will demonstrate how others may gain access to this valuable resource, not only for the Gulf but for the entire MENA (Middle East and North Africa) region. We will explore the research value of these resources and demonstrate how they enrich our understanding of the area. The archive is likely to be of equal value to archaeologists and historians of other regions.

**Keywords:** aerial photography, remote sensing, archaeological survey, landscapes

## Introduction

The value of aerial photography in historical research is well known, particularly in the Near East.<sup>1</sup> This fact is especially salient to scholars undertaking research in the Gulf: very often, the only reliable source of information on settlement, on the material remains of the built environment, and even of some behaviours are aerial photographs. Aerial photographs are 'uniquely rich and textured sources for the study of landscape — recording multi-temporal environments... that other media... cannot match... moments in time are frozen and preserved for future study, ranging from the mundane... to major events of the 20th century' (Cowley, Standring & Abicht 2010: 1). They are the 'prime non-destructive tool' of landscape and urban historical research (Stoker 2010: 33). As aerial imagery shot from aeroplanes, they are often more valuable than the declassified satellite images (e.g. CORONA) often used by archaeologists (e.g. Ur 2013), providing higher-resolution imagery in many cases, which allows the identification of smaller archaeological features. A case in point in the region of study is the use of aerial photographs to identify, map, and analyse the *c.*75,000 burial mounds of Bahrain, using

photographs taken in 1959 at the start of the ongoing phase of destructive development that has now almost wiped out the funerary landscape (Laursen & Johansen 2007). In the case of Bahrain, CORONA images are of insufficient resolution to permit this kind of analysis.

## Locating historical photographs

These points have also been soundly demonstrated in two UCL-Qatar based projects, The Crowded Desert Project and the Origins of Doha and Qatar Project, both funded by the NPRP programme of the Qatar National Research Fund, and both making extensive use of aerial and satellite imagery (Carvajal Lopez 2015; Carvajal Lopez et al. 2016; Fletcher & Carter 2017). Indeed, for both projects the base data supplied by such images is fundamental: these projects would be almost impossible without aerial imagery. During the process of researching and acquiring relevant aerial imagery, given in more detail below, recently declassified and other images housed in the archive at the National Collection of Aerial Photography (NCAP), Edinburgh, were extensively investigated. This prompted a realisation of the quantity, quality, and archaeological utility of available imagery for our region of study, and stimulated the foundation of another QNRF-funded project devoted to the acquisition and archiving of regional aerial images from NCAP at the

<sup>1</sup> Such as the pioneering work of Lionel Rees (Kennedy & Bewley 2009).

Qatar National Library (The Aerial Photography of Qatar, NPRP9-220-6-006).

While searching for maps in the context of the Origins of Doha Project, we discovered those available from Hunting Surveys Ltd, as well as the photographs from which the Hunting maps were drawn, which dated from 1952, 1959, 1966, 1968, 1971, and 1977. Further research uncovered photographs from the 1930s, with proper aerial surveys from 1952, 1953, and 1959 alongside some low-quality aerials from the 1960s and 1970s. The photography undertaken by the RAF, which was mentioned in written sources, and the complete collection of Hunting Survey photographs proved difficult to locate, however. Sourcing this photographic archive, as a resource to support not only our own work but also the future research of others, became a key objective of the project. It is our conviction that the protracted and convoluted process by which this under-utilized archive was uncovered will prove instructive for fellow investigators, potentially saving time and resources for researchers looking to work with this and similar sources of aerial imagery.

Reconstructing the tortuous history of the Hunting Aerial Surveys Ltd photographs proved a challenge, as the company had transformed itself time and time

again until final liquidation in 2001; nevertheless, it is fortunate that the entire Hunting archive landed at the National Collection of Aerial Photography (NCAP). This was providential, since while searching for Hunting Aerial Surveys photographs, we found that this organization also held photographs from Fairey Surveys, Clyde Surveys, Simmons Aerofilms, the Directorate of Overseas Surveys, the Mediterranean Allied Photo Reconnaissance Wing, and the Joint Air Reconnaissance Intelligence Centre (JARIC), among others. Ultimately, the various collections held in the NCAP stores in Edinburgh total in the millions of photographs, and date from 1939 to 1989. The most interesting of these were the photographs assembled in the so-called JARIC collection.

In 2004, a British Intelligence organization once known as MI4 or the Joint Air Reconnaissance Intelligence Centre (JARIC) began a project to declassify its old aerial imagery. After decades of secrecy, the aerial imagery held by JARIC was to be made publicly available. The result, finally deposited in the National Centre for Aerial Photography in Edinburgh (NCAP) in 2013, was a repository of more than 15 million images. While NCAP has naturally concentrated on digitizing British and European imagery, the original source of the photographs — JARIC — contained imagery

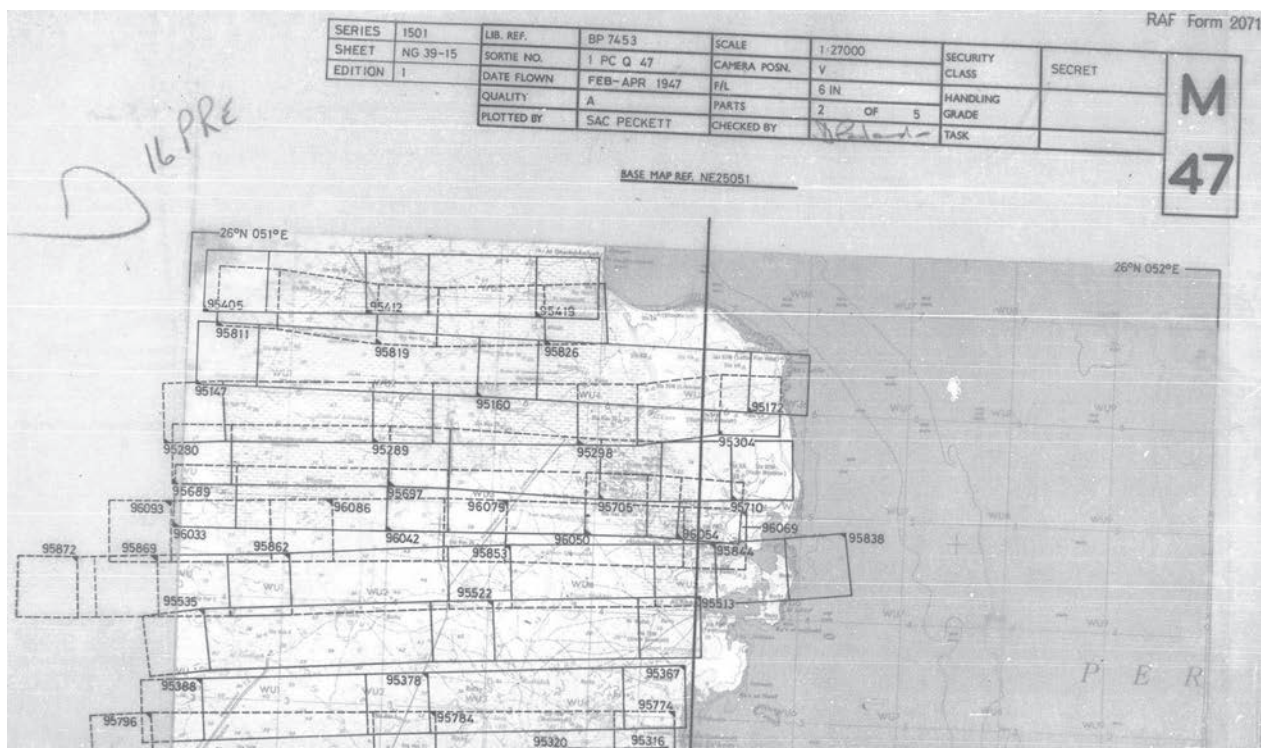


FIGURE 1. Plot of the 1947 sortie IPC Q 0047.

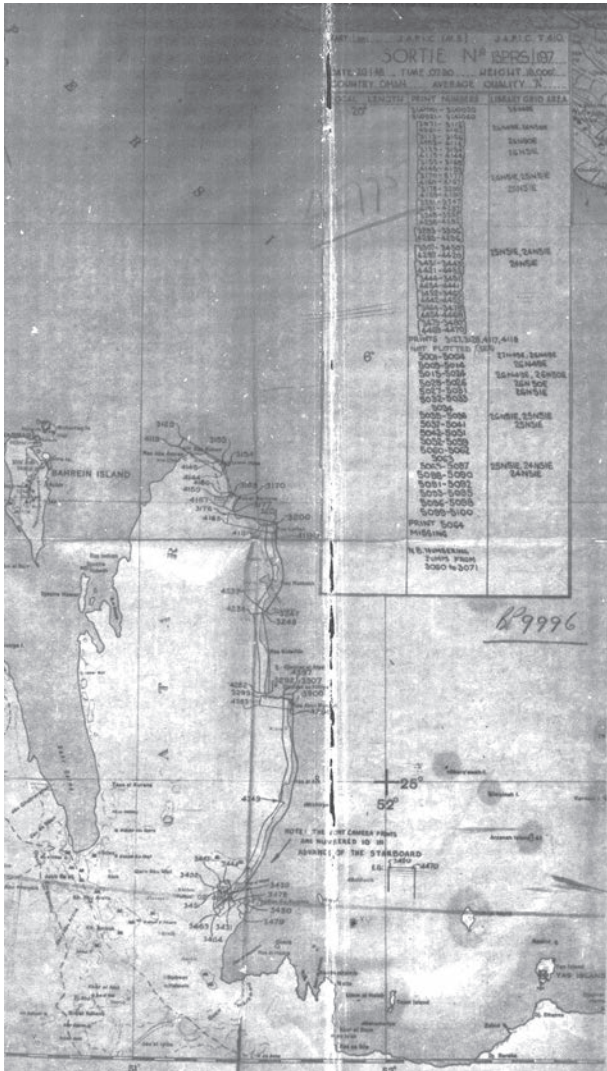


Figure 2. Plot of the 1948 sortie 13 RAF 0197.

from all over the MENA region. JARIC was, after all, the repository for aerial imagery from wherever UK forces had been in operation, or wherever the UK had had an interest. In 2013, JARIC was disbanded and its functions and staff were transferred to the newly formed Defence Geospatial Intelligence Fusion Centre (DGIFC) at RAF Wyton.

It is important to note that JARIC included all images once held by JARIC (Near East), which had been held in Cyprus until 1975, and from the year 2000 it also merged with Military Survey to form the Defence Geographic and Imagery Intelligence Agency (DGIA). All imagery from the Gulf and the whole MENA region, therefore, came to be in JARIC in the UK and was

eventually passed on to NCAP in Edinburgh. Crucially, the cataloguing information for all such photography was not passed on to NCAP; such information does, however, exist. At RAF Wyton, the current home of the Defence Geospatial Intelligence Fusion Centre, intelligence staff have provided the relevant information about some film metadata. Dr Paul Fox from UCL (London) — a former intelligence analyst specializing in aerial and satellite imagery — was able to inform us that such information is available from the CADSTAR database (Computer Assisted Data Storage and Retrieval) of photo-reconnaissance missions. This database kept the records of the so-called ‘plots’ of reconnaissance missions. The plots show the coverage of each mission, which in the past were produced manually by NCO ‘plotters’ and were not necessarily returned with the film.

When NCAP was first approached in 2015, it was believed that collections were ‘presently uncatalogued and it is not possible to conduct searches within it for aerial photography of specific geographical areas’ (NCAP website 2015, [ncap.org.uk](http://ncap.org.uk)). By contacting RAF Wyton directly, however, we were able to find two of the earliest reconnaissance sorties of Qatar. Two missions were flown over Doha: 28 February 1947 and 20 January 1948 (Figs 1 & 2).

Acquisition of these plots gave us some indication of what to expect. The 1948 mission coded ‘1PC Q 0047’, for example, appears to have more than 700 photographs. The 1947 sortie ‘13 RAF 0197’ produced at least 1000 images. The plots provided by RAF Wyton allowed us to order from NCAP Edinburgh photographs of Qatar that had not been seen since they were first taken in the 1940s.

While RAF Wyton had been very helpful, it was pointed out that for Joint Force Intelligence Group (JFIG) at RAF Wyton to conduct further work for us, they needed ‘to be formally tasked’. We were able to contact the officer responsible for some of these matters at UK Joint Forces Command. Wing Commander Derek Miller (now retired) was very helpful and informed us that a Freedom of Information request could be made to the Defence Intelligence Secretariat. Our first attempt was therefore made to [cio-foi@mod.uk](mailto:cio-foi@mod.uk) and to [DIRes-SecFOI@mod.uk](mailto:DIRes-SecFOI@mod.uk) requesting the following:

MOD Information Rights Team  
 2nd Floor, Zone N  
 Main Building  
 Whitehall

London SW1A 2HB

Email: cio-foi@mod.uk

Dear MOD Information Rights Team,

The purpose of this letter is to make a formal Freedom of Information request for some limited film reel information and 'finding aids' for declassified aerial images once held by Joint Air Reconnaissance Intelligence Centre (JARIC) at RAF Wyton.

Requirements: UCL-Qatar are asking to have access to that part of the database held at RAF Wyton that describes the declassified photographs held at NCAP Edinburgh only of the Persian Gulf region 1939–1980 (approximately). Specifically, we ask for records containing the words 'Qatar' and 'Dubai' and 'Abu Dhabi' and 'Kuwait' and 'Bushehr' (Alternative spellings include 'Dubayy' and 'Abu Zabi' and 'Kuwayt' and 'Bushire') only between 1948 and 1962.

The request was refused: 'The MOD is unable to comply with your request under Section 12 of the FOI Act. Section 12 makes provision for public authorities to refuse requests for information where the cost of dealing with them would exceed the appropriate limit. This limit is specified in FOI regulations and for central government is set at £600'. Another request was therefore sent limiting the request to just one town between 1950 and 1960. This request was granted, although the information received included plots for the *entire* Gulf region between 1942 and 1960. The information received was in the form of an 11-page PDF file containing data on 347 reconnaissance sorties, one page of which is shown (Fig. 3). The particularly useful information here is the date of the sortie, the approximate location, and in the last column the sortie identification code. For example, on 20 January 1948 a sortie was flown in Qatar and called 'Ash Shamal/ Al Khawr' and given the identification code 13 RAF 0197. When the code 13 RAF 0197 is given to NCAP,

4147	15/01/1946	Khuzestan	Iran	IR	IRN	A--	BW	V	6779	680B RAF 0208
4200	15/01/1946	Fars	Iran	IR	IRN	A--	BW	V	6749	680BT RAF 0082
4316	15/01/1946	Fars	Iran	IR	IRN	A--	BW	V	6786	680BT RAF 0081
4242	16/01/1946	Esfahan	Iran	IR	IRN	A--	BW	V	6749	680BT RAF 0084
4987	16/01/1946	Chahar Mahall va Bakhtiari	Iran	IR	IRN	A--	BW	F	7779	680BT RAF 0083
4168	17/01/1946	Chahar Mahall va Bakhtiari	Iran	IR	IRN	A--	BW	V	6749	680BT RAF 0086
4169	18/01/1946	Esfahan	Iran	IR	IRN	A--	BW	V	6769	680BT RAF 0087
3653	22/01/1946	Khuzestan	Iran	IR	IRN	A--	BW	V	6656	680BT RAF 0069
16955	22/01/1946	Fars	Iran	IR	IRN	A--	BW	V	4520	680BT RAF 0088
4170	23/01/1946	Fars	Iran	IR	IRN	A--	BW	V	7661	680BT RAF 0089
4198	29/01/1946	Fars	Iran	IR	IRN	A--	BW	V	6786	680BT RAF 0072
7453	01/03/1947	Jarayan al Batnah Al-Wakrah	Qatar	QA	QAT	A--	BW	V	9482	IPC Q 0047
4043	29/09/1947	Al Basrah	Iraq	IZ	IRQ	A--	BW	F	11044	13 RAF 0170
4044	29/09/1947	Al Basrah Khuzestan	Iraq	IZ IR	IRQ	A--	BW	F	8170	13 RAF 0171
43888	30/12/1947	Khuzestan	Iran	IR	IRN	A--	BW	V	1079	13 RAF 0190
9438	12/01/1948	Masqat	Oman	MU	OMN	A--	BW	V	7568	13 RAF 0193
9996	20/01/1948	Ash Shamal Al Khawr	Qatar	QA	QAT	A--	BW	V	7494	13 RAF 0197
4057	21/01/1948	Ash Sharqiyah Jarayan al Batnah	Saudi Arabia	SA QA	SAU	AB-	BW	V	7525	13 RAF 0199
4055	22/01/1948	Musandam	Oman	MU	OMN	ABC	BW	F	7525	13 RAF 0200
4149	07/03/1948	Khuzestan	Iran	IR	IRN	A--	BW	V	6775	680DEV RAF 0072
4205	26/10/1948	Khuzestan	Iran	IR	IRN	A--	BW	V	7574	13A RAF 0134
4206	27/10/1948	Khuzestan	Iran	IR	IRN	A--	BW	V	6762	13A RAF 0136
4229	29/10/1948	Khuzestan	Iran	IR	IRN	A--	BW	V	6767	13A RAF 0140
4203	09/11/1948	Khuzestan	Iran	IR	IRN	A--	DW	V	7155	13A RAF 0149
4215	12/11/1948	Khuzestan	Iran	IR	IRN	A--	BW	V	9281	13A RAF 0158
3699	13/11/1948	Dhi Qar Al Basrah	Iraq	IZ	IRQ	A--	BW	F	6832	13A RAF 0161
16791	13/11/1948	Dhi Qar	Iraq	IZ	IRQ	A--	BW	V	4387	13A RAF 0160
16792	18/11/1948	Al Basrah	Iraq	IZ	IRQ	A--	BW	V	8188	13A RAF 0166
3704	10/12/1948	Maysan	Iraq	IZ	IRQ	A--	BW	V	8154	13T RAF 0001
4655	15/12/1948	Maysan	Iraq	IZ	IRQ	A--	BW	F	7158	13A RAF 0178
4971	02/04/1949	Al Ahmadi	Kuwait	KU	KWT	A--	BW	V	8624	16 AGS ME 0004
28164	09/05/1949	Al Basrah	Iraq	IZ	IRQ	A--	BW	O	5772	208A RAF 0017
16797	09/02/1950	Al Ahmadi Hawalli Al Kuwayt Al	Kuwait	KU	KWT	A--	BW	V	8200	13 RAF 0489
4945	29/10/1950	Ra's al Khaymah	United Arab Emirates	AE	ARE	A--	BW	V	7466	13 RAF 0545
3911	21/11/1950	Al Jahrah	Kuwait	KU	KWT	A--	BW	V	6710	683A RAF 0119
4947	24/03/1951	Al Muharraq	Bahrain	BA	BHR	A--	BW	V	7217	13A RAF 0274
4950	24/03/1951	Ra's al Khaymah	United Arab Emirates	AE	ARE	A--	BW	F	8580	13A RAF 0271

FIGURE 3. Example of plots of reconnaissance missions in the Gulf, 1946–1951.

they will supply a number of plots (see, for example, Fig. 2) from which photographs can be selected.

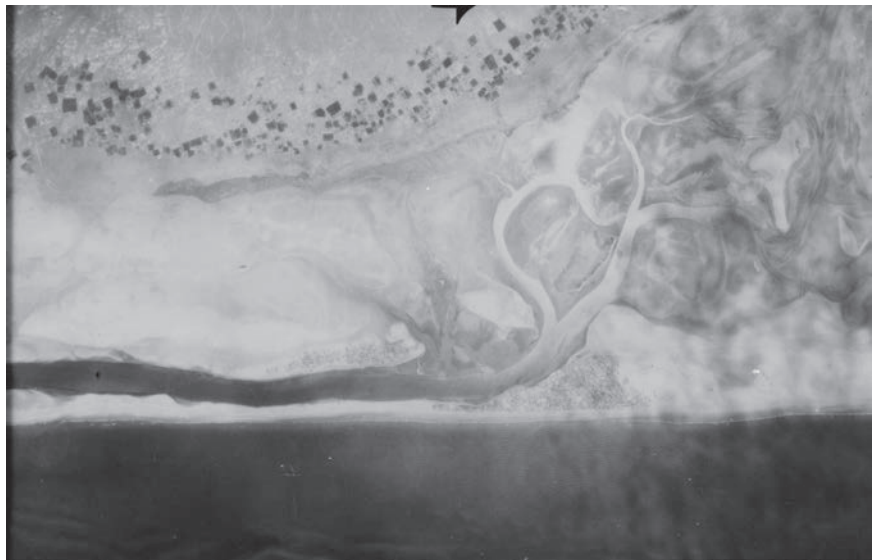
### **Potential utility of the photographs**

The quality and usefulness of the photographs that can be ordered from NCAP vary according to several factors. While NCAP will allow the purchase of the very highest quality images, what one receives will depend on the

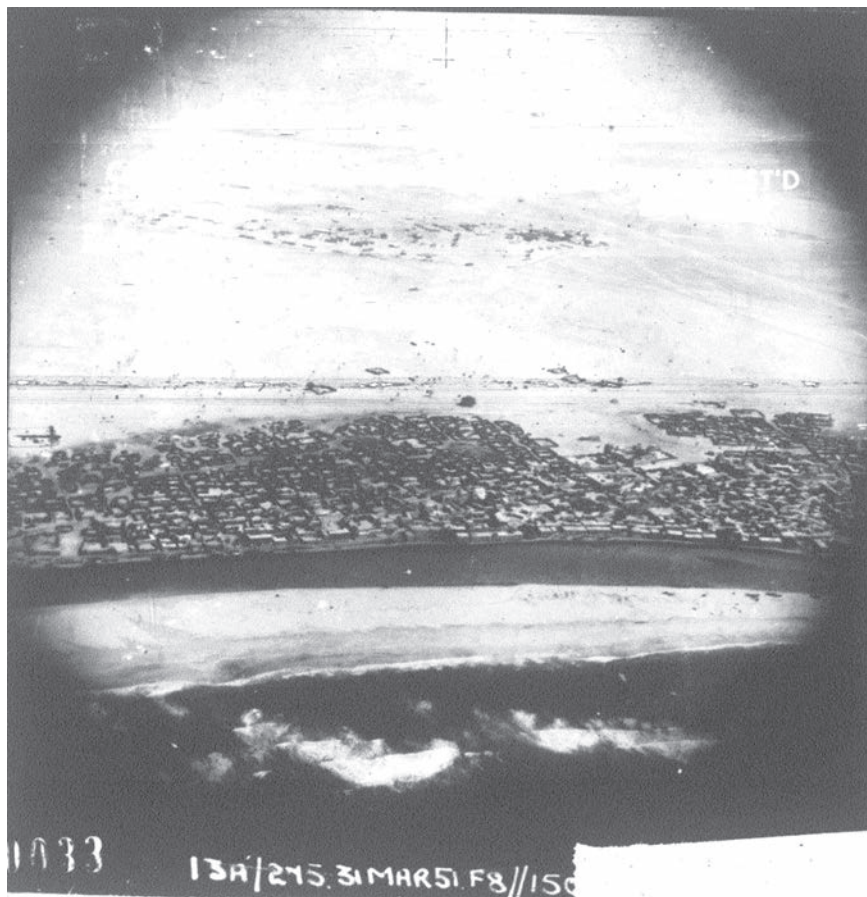
quality of the image held in NCAP's collection. Some images allow one to see an individual walking along a road (Fig. 4). Other images, however, are of poor quality and were originally faulty or defective (Fig. 5). Much depended on the cameras used, the film, the height, the skill of the reconnaissance team, and weather and visibility conditions. Most photographs are overheads and they overlap to a greater or lesser extent, although oblique photographs are known (Fig. 6).



**FIGURE 4.** *Two people walking along a road north of Doha in 1948 (sortie 13 RAF 0197).*



**FIGURE 5.** *Ras al-Khaimah in 1951 (sortie 13A RAF 273).*



**FIGURE 6.** *Sharjah in 1951*  
(*sortie 13A RAF 0275*).

Usually, all the photographs enumerated in the plots of any sortie are available from NCAP and the staff there are helpful and efficient in providing scans. There are instances, however, when coverage may be incomplete. An example is Bushehr in the 1940s. Several sorties covered this town, but all copies of photographs of the old town have been lost. It is likely that one Intelligence Officer never returned the photographs of the old town after inspection (Fig. 7).

### Conclusion

The utility of the photographs is without question, particularly with regard to research in history and historical archaeology. In the Origins of Doha and Qatar Project, the photographs have provided high-resolution overhead and oblique shots of living and recently abandoned villages and townscapes, allowing us to make a detailed assessment of the sedentary occupation of Qatar in the 1930s–1940s, this being the period of depression and depopulation that followed the collapse

of the pearl fishery (formerly the mainstay of the regional economy). This allows a comparison with the pre-oil peak occupation of the region at the start of the twentieth century, as detailed in Lorimer’s statistical data and maps (Lorimer 1908), as well as a comparison with the patterns of renewed growth and reorganization that occurred in the 1950s under the impact of oil revenues. Moreover, the aerial photographs permit us to conduct a detailed urban analysis of the towns of Qatar and the Gulf, being of sufficient resolution to allow the digitization of individual houses, roofed areas, and streets and alleyways, thus allowing GIS-based spatial analysis and comparisons (see Fletcher & Carter 2017 for an initial study of Doha). Historians, museum professionals, and other heritage experts have already begun to use the high-resolution imagery to reconstruct urban scenes and 3D models using CAD applications.

Archaeological applications for earlier time periods are already apparent, for example at the eighteenth–twentieth-century site at Fuwayrit, Qatar (currently under excavation by the Origins of Doha and Qatar Project),

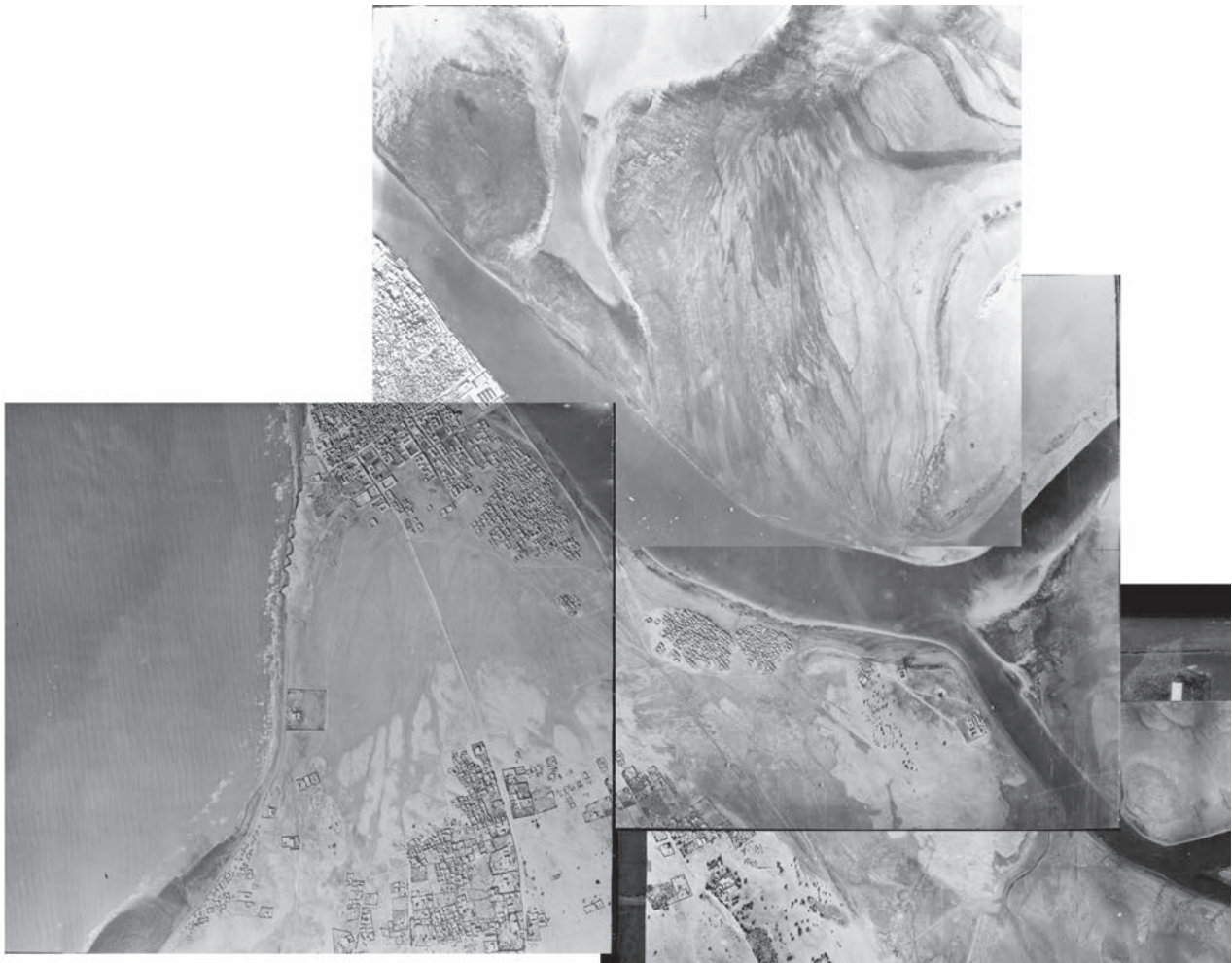


FIGURE 7. *Bushehr in 1945 (sortie 680BT RAF 54).*

where a whole section of the site — previously unknown — was revealed by 1940s aerial photographs (Fig. 8). As noted above, however, the range of resolution and quality of imagery is variable and, in some cases, we have observed archaeological features that are visible today on recent satellite imagery available online (via Google Earth), which cannot be seen on the JASIC aerial imagery. We nonetheless anticipate that detailed examination of other regions of Qatar and the Gulf will reveal further archaeological features which have since been disturbed or destroyed, and which are not as clearly visible in archival satellite imagery.

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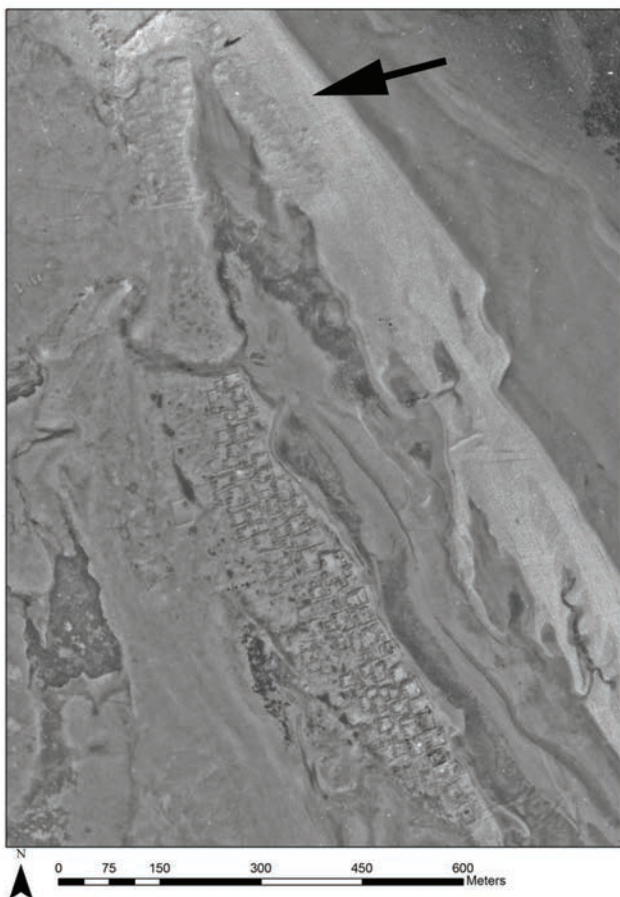


FIGURE 8. *Fuwayrit in 1948.*

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