

CONTENTS

<i>TEXTS AND MANUSCRIPTS: DESCRIPTION AND RESEARCH</i>	3
J. Musaelian. On the First Kurdish Edition of the <i>Sharaf-nāma</i> by Mullā (Melā) Maḥmūd Bāyazīdī	3
M. Vorobyova-Desyatovskaya. A Sanskrit Manuscript on Birch-Bark from Bairam-Ali: I. The <i>Vinaya</i> of the Sarvāstivādins (part 3)	7
M. Hasani. A Unique Manuscript of the Medieval Medical Treatise <i>al-Iktifā'</i> by Abū-l-Muṭrib 'Abd al-Raḥmān	20
Du Weisheng. The Ancient <i>Fengkui</i> 縫續 (Stitched) Books from Dunhuang	25
<i>TEXT AND ITS CULTURAL INTERPRETATION</i>	33
I. Petrosyan. Pre-Islamic Turkic Tradition in the Writings of the Early Ottoman Historiographers	33
<i>PRESENTING THE COLLECTIONS</i>	36
M. Vorobyova-Desyatovskaya. Sanskrit Manuscripts from the N. F. Petrovsky Collection in the St. Petersburg Branch of the Institute of Oriental Studies	36
<i>MANUSCRIPTS CONSERVATION</i>	40
N. Brovenko. On Changing the Means of the Berezovsky Collection Storing	40
<i>ORIENTAL MANUSCRIPTS AND NEW INFORMATION TECHNOLOGIES</i>	47
H. Kaileh. A Feasibility Study for the Digitalisation of Arabic Manuscript Collections in Jerusalem.	47
<i>PRESENTING THE MANUSCRIPT</i>	58
O. Akimushkin. A Copy of the "Early <i>Dīwān</i> " by Jāmī in the Collection of the St. Petersburg Branch of the Institute of Oriental Studies	58
<i>BOOK REVIEWS</i>	66
<i>Manuscripta Orientalia</i> in 1999, vol. 5, Nos. 1—4 (list of contributions)	71

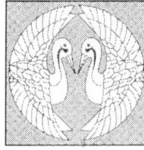
Front cover:

"The Sultan's repose in nature", miniature from 'Abd al-Raḥmān Jāmī's *Dīwān*, manuscript C 1697 in the collection of the St. Petersburg Branch of the Institute of Oriental Studies, A. D. 1486/87, fol. 243 b, 7.7×7.7 cm.

Back cover:

"Portrait of some Moghol principal or influential grandee sitting in a chair (throne?) with a falcon on his right arm", miniature from the same manuscript, fol. 1b, 7.3×14.8 cm.

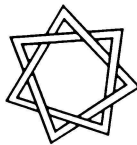
RUSSIAN ACADEMY OF SCIENCES
THE INSTITUTE OF ORIENTAL STUDIES
ST. PETERSBURG BRANCH



Manuscripta Orientalia

International Journal for Oriental Manuscript Research

Vol. 5 No. 4 December 1999



TSESA
St. Petersburg-Helsinki

ORIENTAL MANUSCRIPTS AND NEW INFORMATION TECHNOLOGIES

Hala Kaileh

A FEASIBILITY STUDY FOR THE DIGITALISATION OF ARABIC MANUSCRIPT COLLECTIONS IN JERUSALEM

The digitalisation of documents is a new technology that has recently come to be practised in libraries. It is an extremely important technique for increasing the value of documents, which are part of the national heritage, and manuscripts in particular, by improving access to them and helping with their preservation. This report is a feasibility study of the digitalisation of a collection of manuscripts in Jerusalem.

In the last few years, with the development of new information technology and improvements in communications, especially with the emergence of the Internet, digitalisation has become a technique which seems to be capable to solve many problems of conservation, dissemination of information and its processing. Applied to documents, it can help with their preservation, improving the possibilities of access to them. This new technology offers the best means of close study of manuscripts as well as a means to gain ready access to them from distance. The studies carried out by the author of the present article have established a huge important potential of this technology exists to improve preservation of the national heritage and manuscripts

in particular. Good examples of this are the projects of the Bibliothèque Nationale de France and that of the Vatican Library.

Manuscript collections in Jerusalem constitute a very important cultural resource which deserves being preserved as part of the universal cultural heritage and of the Palestinian national heritage as well. The transmission of knowledge is a strategic factor in social and cultural development. For this reason, carrying out a study on the possibility of preserving and safeguarding those manuscripts by using digitalisation technique can be viewed as a very important task, since the new technology enables us to have a good means to present the treasures of the national heritage to everyone. It is of especially importance when there are problems of access as is the case with Jerusalem which has been closed to the residents of the West Bank and the Gaza strip since 1993. At the same time, the political situation in Palestine makes access to Palestine and its cities (in particular, to Jerusalem) impossible for the majority of residents in the neighbouring countries.

1. HISTORY AND STATUS OF MANUSCRIPTS

For centuries Jerusalem has stored very rich manuscript collections, both in Arabic as well as in other languages. It is only natural that the majority of these manuscripts are in the Arabic language, and Jerusalem remains a major centre for Islamic studies. A great deal of these manuscripts have been in private hands until recently, and it is thanks to the efforts of many families that the manuscripts have survived. U. Haarmann [1] mentions that information on manuscripts kept in Jerusalem is recorded in a catalogue dating back to the fourteenth century. However, the most ancient surviving catalogue of Arabic manuscripts in Jerusalem goes back to 1881. According to the *Majallat al-Athār* (Zahlah, Lebanon), it was composed by the priests of the Greek Orthodox Monastery for their collection.

Similarly, during the Ottoman period, the library of the al-Khalīdī family possessed a register (*daftar*) of all their manuscripts, with information on when they came into the possession of the family. It is now evident from these catalogues that a number of the manuscripts has been lost. Indeed, not only manuscripts have disappeared, the whole libraries which were recorded as existing during the British mandate have vanished. According to Conrade and Salameh, these libraries ceased to exist after the war of 1948. The war also forced some families to leave their places of residence, and this may explain the existence of some of these manuscripts outside Palestine, which constitutes a great loss to the Palestinian national heritage, and especially to Jerusalem. At present, most of the remaining

manuscript collections face others problems, such as the lack of resources by families and religious institutions for their conservation and restoration.

The second volume of the "World Survey of Islamic Manuscripts" al-Khalidī [2], published by Al-Furqān (Islamic Heritage Foundation), contains the following information: there are approximately 21 institutions in Palestine which possess Islamic manuscripts in the Arabic language;

the total number of manuscripts there is approximately 11,275; 10,403 of these manuscripts are in Jerusalem, from which 8,476 are in the holdings of Palestinian institutions and 1,927 — of Israeli institutions. The rest 872 manuscripts are found in cities other than Jerusalem: Abu Sinan, Acre, Burquayn, Hebron, Jaffa, Nablus and Tel Aviv.

However, now there is the opportunity to include in this list the collection of the Greek Orthodox Monastery library.

2. PRESENTATION OF INSTITUTIONS AND COLLECTIONS

Five libraries, studied here, include 5,650 manuscripts constituting the majority of Arabic manuscripts. The following abbreviations for these libraries are used:

- L1: the al-Aqṣā mosque library
- L2: al-Khalidī library
- L3: Markaz Ihyā' al-Turāth al-Islāmī library
- L4: Markaz 'Isāf al-Nashāshibī library
- L5: Greek Orthodox Monastery library

It turned out to have been not possible to include al-Budayrī library which also holds an important collection of manuscripts: it was closed because of administrative and economic problems. However, it is necessary to point out that there is a catalogue of this library, which includes an introduction on the history of the library and a list of 636 manuscripts it possesses. This library is the private property of al-Budayrī family.

2.1. THE STATUS OF THE INSTITUTIONS

The institutions covered by the inquiry can be divided into two types. The first takes into account the status of the institution — whether it is under a public tutelage or in private property.

The second type considers the nature of the institutions — whether they are encyclopaedic or specialised. The crossing of these two typologies gives us the results as shown in *Table 1*.

Table 1

Typology 1 \ Typology 2	Private	Public
Encyclopaedic	L 2, L 5	L 1
Specialised	L 4	L 3

The table shows that the majority of the institutions that hold these manuscripts (three) have a private status. This situation can be explained by the absence of a Palestinian national state that would be able to unite manuscripts in a national library, as is in most countries, or to place libraries under the public authority which would allow manuscripts to be classified as the national heritage and the inalienable property of the state. Moreover, in the absence of a national state, some families have played and continue to play a decisive role in the safeguard of this patrimony. The expression 'private status' here refers to family libraries or to the institutions created originally on personal or family initiative but subsequently transferred into cultural centres and libraries belonging to religious institutions (monasteries, mosques, etc.).

These institutions sometimes benefit from external financial assistance from other institutions such as cultural foundations or famous funding bodies in the western countries. The collections of these private libraries represent family inheritance (*waqf dhurrī*), some of them being very old. For example, L 2 can be traced to the end of the nineteenth century. This library is lodged in a building that dates from thirteenth century, i.e. from the Mamlūk period. L 5

possesses rare collections in ancient languages, while L 4, is specialised in all the subjects relating Jerusalem and its personalities. The latter was founded in 1986 as a part of Dār-al-Ṭifl College. After it was attached to the university of al-Quds in 1992, it came to be known as the Islamic research Centre which existed until 1996. It then achieved an autonomous status and was renamed 'Isāf al-Nashāshibī Centre.

Palestinian families have even played a role in the foundation of some public libraries' collections, as is the case of L 1, whose manuscript collection grew out of family collections. Four different collections were united to constitute the current library: the ancient library of Dār Kutub al-Masjid al-Aqṣā, of shaykh Ḥasan al-Ḥusaynī (d. 1811), shaykh Khalīl al-Khalidī (d. 1941), and the collection of 360 manuscripts in Arabic of shaykh Muḥammad al-Khalīlī (d. 1734). This library was created in 1922 by the High Islamic Legislative Advisory of Jerusalem under the name of Dār Kutub al-Masjid al-Aqṣā in the ancient Madrasa al-Ashrafiyya (school al-Ashrafiyya) established in the fifteenth century by the Mamlūk Sultan Qā'it Bāy. Not all the wealth of the collection has been transmitted to the current library which was opened on 1976 as Al-Awqāf Public

Library. **L 3** is an academic library that also possesses rare and ancient manuscripts. One of its missions is to revive the collections of Islamic manuscripts. The library is at present

under the responsibility of the Palestinian authority and is attached to the University of Al-Quds.

2.2. DESCRIPTION OF THE COLLECTION

Table 2

Manuscripts Number	Library
(250)	L 5
(400)	L 4
(1246)	L 2
(2000) (MSS and <i>majmū'āt</i>)	L 1
(3700)	L 3

In terms of manuscripts number, **L 1** possesses the second collection after **L 3**. It contains approximately 2,000 manuscripts and collections (*majmū'āt*) which date back to the Mamlūk and Ottoman periods. They cover the following subjects: religion, Arabic language and literature, biography, and mathematics. The most ancient manuscript dates to 450/1058—59. One of the most important manuscripts of this collection is dated by 1228 and is entitled *al-Nawādir al-sultāniyya wa-l-mahāsin al-Yūsufiyya* (the author of the work is Bahā' al-Dīn Yūsuf b. Rafī' Ibn Shaddād). This manuscript was copied six years before the death of its author.

L 2 possesses manuscripts that date back to the Ayyūbid, Mamlūk and Ottoman periods. There are 1,246 manuscripts in Arabic, 36 in Turkish and 18 in Persian. Subjects covered by these copies are history, religion, philosophy, mathematics, medicine, pharmacology, and music. The collection of **L 2** originates from the eighteenth century. Its most ancient manuscript was written in 1027/1617—18. This collection contains 70 very rare manuscripts, including 3 that are the only copies in the world. Among them is *al-Akhhbār al-mathūra* by Muḥammad b. al-Ḥaṣan Ibn Durayd that dates to the fourth century A. H.

The fund of **L 3** also goes back to the Ayyūbid and Ottoman periods. It is the most important fund from the viewpoint of manuscripts number. Among 7,000 titles that constitute the funds of this library, there are 3,700 manuscripts

on history, religion, philosophy, Arabic language and literature (syntax), mathematics, astrology and engineering. The library also holds a collection of postcards of Jerusalem of the Ottoman and British Mandate periods. The most important manuscript in the library is a copy of the Qur'ān that goes back to the second century A. H.

The fund of **L 4** contains up to 9,000 titles from which 400 manuscripts relate to Jerusalem. But it also contains works on theology (*uṣūl al-fiqh*), philosophy, medicine and biography. These manuscripts go back to the Mamlūk and Ottoman periods. The most important manuscript is *Risālat al-jawāb al-qawīm al-muta'alliq bi-iqtā al-Sā'id Tamīm al-Dārī*. This manuscript is the only surviving copy in the world. It has been published recently.

The manuscripts in **L 5** are the most old and date back to ninth — tenth centuries. The library contains several old and rare collections such as the "Holy Sepulchre", Salbonique, Syriaque, Georgian, Ethiopian collections and the collection of the Mār Saba monastery. 250 of these manuscripts are in the Arabic language and range from the ninth century to the Ottoman period. They cover the following subjects: history, religion, philosophy, Arabic literature. The most important Arabic manuscript is *al-Nāmūs al sharīf wa-l-muṣḥaf al-'ālī al-munīf al-mutaqāmin al-subāt majmū'a al-kibār*. Written on a special paper manufactured from cotton, it was offered as a gift to the Patriarch Basil in the seventeenth century. The only existing catalogue of these Arabic manuscripts goes back to 1901.

3. PARTICULAR PROBLEMS

3.1. ADMINISTRATIVE AND JUDICIAL PROBLEMS

There is a total judicial void concerning copyright regulation, etc. in Palestine. The institutions which hold manuscripts in Jerusalem also suffer from administrative supervision. The political status of this city, which has still not been determined, puts some Palestinian institutions, as well as their libraries, under organisational and administra-

tive risk. Such is the case of **L 1**. This is part of the Awqāf Organisation, which is under the Jordanian administration. The latter has a great deal of influence on the general situation of the library, and sometimes it can hinder development library projects.

3.2. ECONOMIC PROBLEMS

Table 3

Financial support	Library
Specific manuscripts budget	L 1, L 3, L 4, L 5
Sufficient budget (with no guarantee of the continuation of further financing)	L 2
Modest budget for particular aims	L 1, L 2, L 3, L 5 (fumigation) L 2 (air conditioning) L 4 (sterilisation)

Generally speaking, the five libraries, regardless of their status, suffer from financial shortages. They have no fixed budgets for manuscripts conservation and restoration. However, the situation in L 2, which is a private library, is relatively better than in other libraries. The budget of a private library is usually more flexible, especially if the proprietors are active and motivated to safeguard their family treasure. Thanks to the efforts of one of the members of al-Khalīdī family who resides in the United States, L 2 has been given a grant for the restoration of the manuscripts and for the improvement of their conservation. Unfortunately, nobody can guarantee the renewal of this allowance. Nevertheless, thanks to this grant, L 2 has currently an important programme under way, and it is able to afford costly abroad restoration that reaches 3,700 FF for each manuscript. The overall conservation cost reaches 10,000 FF.

L 5 is financed by the general budget of the Monastery, but unluckily it has no permanent or specified budget. Library finances solely fumigation, which demands 50,000 FF per year. The case of L 1 is a little different, because the Awqāf Organisation which manages the library is still under the Jordanian administration. It is this last that determines the budget. L 1 spends approximately 15,500 FF per year on fumigation.

L 3 is under the Palestinian authority and this one has not yet established a fixed budget for the safeguard of manuscripts. Nevertheless, fumigation expenses reach approximately 91,000 FF per year.

The budget of L 4 is in a stage of reorganisation after the library's detachment from the Islamic Study Centre. Meanwhile, there is a modest budget of approximately 3,300 FF for manuscripts sterilisation.

3.3. TECHNICAL PROBLEMS

3.3.1. Conservation and restoration conditions

Table 4

Manuscripts conservation	Library
Not satisfactory conservation	L 1, L 3, L 4, L 5
Conservation according to professional criterion	L 2
No restoration	L 1, L 4, L 5
Library restoration	L 3
Abroad restoration	L 2

All five libraries possess microfilm copies of at least some of their manuscripts. L 1 has about 2,000 microfilms of manuscripts, L 2 — 700, L 3 — 700, and L 4 — 100. Manuscripts fund in L 5 is wholly microfilmed and deposited in the University of Jordan (L 5 itself keeps no microfilm copies). It should be noted that, with the exception of L 2, the library buildings are badly equipped for conserva-

tion (i.e. bad air conditioning equipment, etc.), and this creates a dangerous situation as far as the safety of manuscripts is concerned. There is neither thermal insulation nor protection against the humidity in L 2. The situation is even worse in L 3 where manuscripts are preserved in a glass cupboard, without air conditioning and alarm system. L 4 has the only sterilisation machine in the whole West Bank

of Jordan and it is the only process applied to the manuscripts with the aid of this machine. The operation is carried out every three to five years depending on the physical conditions of the manuscript. L 5, like L 3, preserves its manuscripts in a glass cupboard. Manuscripts in the library are only dusted annually and fumigated.

Although the building of L 2 is very old, manuscripts there are kept in the best conditions (the best among the five libraries from the viewpoint of conservation). The library is well air-conditioned, it is provided with metal shelves and manuscripts are put in non-acidic cardboard boxes; they are preserved in strong cupboards. Three of the five libraries have no means for any restoration. This is often because of funds shortage.

However, it is necessary to specify the situation. L 1, receives yearly allowance from the Jordanian government. Nevertheless, a restoration project, which involves only that part of the collection which is threatened with deterioration, will soon be realised thanks to the help of the Al-Ta'awun foundation (NGO). The detachment of L 4 from the Islamic Research Centre and its later reorganisation has unfortunately delayed realisation of a similar project in this library.

As to L 5, the absence of restoration projects can be explained solely by negligence. Some measures were taken in L 3 which carries on restoration in its reprography workshop. Finally, L 2 is the only library with a serious restoration project: all manuscripts which need restoration are sent to London.

3.3.2. Communication and conditions of access

Table 5

Consultation conditions	Library
Original MS consultation	L 5
Microfilm copies consultation	L 1, L 2, L 3, L 4

Table 6

Users category	Library
Teachers and researchers	L 1, L 2, L 3, L 4, L 5
Students	L 1, L 3, L 4
Officials	L 3
Scholars	L 4, L 5

Table 7

Users residences	Library
Jerusalem	L 1, L 2, L 3, L 4, L 5
West Bank and Gaza strip	L 1, L 2, L 3, L 4, L 5
The 1948 territories	L 1
Arabic countries	L 1 (Jordan)
Other countries	L 5 (Greece)
	L 5 (Unite States)

Access problems are similar in all the libraries. Manuscripts are located in strictly determined library premises, and the readers have to go there, which demands special permission. Visa restrictions often make access to manuscripts even more difficult.

L 4 is the only library that has users statistics. The comparison of the number of users in the period between 1990 and 1996 shows that it has decreased from 924 to 200. This negative trend can be explained by the closure of Jerusalem which prevents the researchers from getting

access to the manuscripts. The same problem faces the users of **L 3**; at present, access is limited to the residents of Jerusalem and especially to the students of the al-Da'wā wa Uṣūl al-Dīn college. A range of users of **L 5** is wider. Every year the library receives approximately 500 researchers of which two-thirds are foreigners from the United States or Europe. It is worth mentioning that it is easier to get access to Jerusalem for a foreign researcher than for a West Banker.

L 1 functioning as a public library is visited by various users. The Israel-Jordan peace agreement enabled a limited

number of Jordanians researchers to come and consult manuscripts in this library with the permission from the Israeli government. **L 2** is closed now to the public because of a continuing restoration. However, researchers can obtain a microfilm copy of any manuscript they need after paying the cost of microfilm production and postage.

Consulting all **L 2** manuscripts is usually restricted to using microfilm copies. This is the case with the first four libraries: the originals are available only when there is no microfilm copy. Consulting originals in **L 5** is connected with the absence of microfilm copies.

4. DIGITALISATION PROJECT REASON

Digitalisation permits the libraries to solve many problems with concern to manuscripts. These are:

1. The problem of conservation which demands transferring manuscripts into electronic form. This substantially diminishes the damage caused by manuscripts handling, especially when it concerns ancient or fragile materials such as parchment, papyrus, leather, etc. It can also safeguard manuscripts against unlucky accidents or criminal intentions.

2. The access problem: the lack of access produces a serious problem for researchers who live on the West Bank. Existing statistics shows that the majority of the current users are Palestinian from Jerusalem, Israelis or scholars from abroad. The predominance of these groups of researchers cannot be explained by the fact that they are those who solely take interest in manuscripts. No less interest demonstrate potential readership from the West Bank,

Gaza and neighbouring Arab countries, but they are unable to get access to the manuscripts representing their national heritage.

Electronic copies are easier to handle than the originals. Consulting originals is often limited by the nature of the manuscript. For example, it may be a particularly large volume, which makes its using difficult. Other restrictions may be imposed by the libraries because of the manuscript's conditions. Mounting digital manuscripts on a network makes them available for consultation from distance, be that at home or elsewhere. However, extra equipment and some infrastructure is needed in order to employ the advantages of electronic forms.

In support of the digitalisation project, the respondents, to the questions of the interviewer, named three main reasons (the third can be divided into two). The answers are reflected in *Table 8*.

Table 8

Reason		Library				
		L 1	L 2	L 3	L 4	L 5
Safeguarding against manuscripts' deterioration		X	X		X	
Expenses reducing (or gaining some income)		X			X	
From a distance access facilitating	Closure problem solution	X	X	X	X	
	Gaining Internet value				X	

There is another reason which was indicated in addition to those mentioned above. Some respondents pointed to the economic advantage of digitalisation. The view of our spokesmen for **L 1** and **L 4** was that the digitalisation of manuscripts would save restoration money. On the other hand, using digitalisation provides an opportunity for raising library revenues (selling the CD-ROMs, Web-site access pay, etc.).

The strongest interest in this is shown by **L 4**, may be because the director of the centre, who much travels abroad, is better acquainted with the advantages of this technology.

At the same time, **L 5** shows almost no enthusiasm for this kind of a project. The chief concern, according to the librarian, is the question of priorities. In his opinion, it is necessary to begin with the improving of manuscripts conservation and restoration before any commitment in the digitalisation project is made.

The Librarian in charge of manuscripts in **L 1** mentions the three main reasons without going into the detail of the third (see *Table 8*) since he is a specialist with professional training and wide practical experience. Our respondent at **L 2** bases his view on the need for conservation and accessibility. However, his enthusiasm is

rather restrained because of the reluctance shown by the owners of these manuscripts. They hold that family treasures should be kept out of the Internet while University librarians believe it is of no value if it is not available for the

researcher. L 3 is sensitive about the need to give priority to the usage question. This is probably why his response is confined to the general acknowledgement of the importance of digitalisation as a means of documents access.

5. WHO DOES WHAT

The process of digitalisation cannot be restricted to one person, be that librarian, keeper or owner. Such a project usually involves several people, including owners, librarians, researchers, international governmental organisations

and NGOs. It also requires bilateral co-operation. The table below shows the role of each of these actors in making such a project work.

Table 9

Who	What	How
Tutors or proprietors	Authorisation	1. Agreement and convention 2. Signature
	Finance searching	Contact with funding organisations
Professional librarians	Administrative Work	1. Costs establishing 2. Bids publicising 3. Depriving catalogues from suppliers 4. Consulting between professionals
	Library work	Priorities defining (determination of deteriorated manuscripts)
	Technical Work	1. Cataloguing and bibliographical classification 2. Equipment and software choice 3. Digitalisation technique choice
Researchers	Scientific work	1. Choice of manuscripts for research use 2. Manuscripts revision 3. Work on documents and comparative research
International organisations	Technical assistance	1. Training of personnel 2. Experts mobilisation
	Material assistance	1. Financial support 2. Equipment supply
International co-operation	Technical assistance	Experts mobilisation
	Material assistance	1. Financial support 2. Equipment supply
NGO	Technical assistance	Experts mobilisation
	Material assistance	1. Financial support 2. Equipment supply

It is worth mentioning that at present, the number of professional staff is extremely limited in all libraries examined. Besides, L 1, L 2, L 3 and L 5 have only one professional librarian, and L 4 — two. Even these professionals are lacking appropriate training in or knowledge

of digitalisation technique. Therefore, all of them need special training to be able to carry out such a project in the future. On *Table 10* information on professional librarians qualification is shown.

Table 10

Library	Professional librarians	Qualification	Experience term
L 1	1	Master in library science	21 years
L 2	1	Library research counsellor (Professor of history)	5 years
L 3	1	Expert in manuscripts	About 20 years
L 4	2	Manuscripts keeper	12 years
		Manuscripts keeper's assistant (BA in library science)	Less than 1 year
L 5	1	Specialist in library science and literature	5 years

Some of the professional librarians are the authors of bibliographical publications (indexes or catalogues). The curator of L 1 has published several catalogues (of manuscripts in the libraries of al-Aqṣā and al-Budayrī), that one of L 2 is in the process of publishing a four-volume catalogue of the library manuscripts (publication is being prepared with the assistance of the al-Furqān Foundation in London). As for their readiness to the project of digitalisa-

tion, the professional librarians of L 1 and L 4 support the idea completely. Those in L 2, L 3 and L 5 have proposed other measures as an alternative. The research counsellor of L 2 insists on the necessity of protecting the rights of the owners against excessive usage and piracy, especially if the documents are put on the Internet. The librarian in charge of L 5 believes that the restoration of manuscripts in bad conditions must have priority over other measures planned.

Table 11

Attitude towards digitalisation	Library
Unconditional YES	L 1, L 4
YES, but (or NO, except if)	L 2, L 3, L 5

The true picture of the manuscripts digitalisation problem would be incomplete unless we say some words about the topics of the writings represented by the manuscripts in

the libraries under question, which draw the largest attention of researchers. The related information is shown on Table 12. This information is provided by the libraries staff.

Table 12

Topic	Library
Arabic language and literature	L 3
History	L 4, L 5
Palestinian personalities and their biographies	L 4
Religion	L 1, L 3, L 4, L 5
Philosophy	L 1, L 5

6. METHODS AND STAGES OF DIGITALISATION PROJECT IMPLEMENTATION

6.1. ORGANISATIONAL, JUDICIAL AND FINANCIAL ASPECTS

In the absence of an organisation to develop digitalisation and to direct co-operation between the participants, there is a risk to lose all the benefits of the project.

The question arises how to organise all the partners to gain the best results? The Palestinian participants can be inspired by the corresponding experience in other countries

and organisation models used in some successful programs like UNESCO's "Mémoire du Monde". It should be noted that although the owners of manuscripts are of different status, they still have the same interest in digitalisation. Taking into account what was recommended by UNESCO within the above-mentioned program, it would be fruitful if all the Palestinian participants were united within a national committee. Its aim would be the selection of an appropriate digitalisation project, the collection of finances and arbitration of different viewpoints.

The work of this national committee would be placed under the patronage of the Ministry of culture. This national committee would be also assisted by specialised committees as well as by a permanent secretariat responsible for the running of the project and of contacts between the participants and authorities. Two specialised sub-committees could be formed, the first — with a technical and scientific brief (training of specialists, technical file preparation and elaboration of terms and conditions, etc.) — and the second — with an administrative and judicial role (elaboration of contracts, issuing authorisation, etc.).

6.2. COMPUTER ASPECT

6.2.1. Software

The problem of recognition even of a printed Arabic text is one of the most difficult in the process of digitalisation [3]. Manuscript texts provide much more difficulty. There are about one hundred different styles of Arabic handwriting, among them ten are employed more often. These are *Kūfi*, *thuluth*, *naskhī*, *dīwānī*, *riqa*, *taghra*, *Maghribī*, etc. Each of these often are ornamented (see *fig. 1*). There is also a diversity of each handwriting sizes, which creates the problem of recognition. The differences can also be due to the personal characteristics of a particular hand. Other factors, such as the instrument of handwriting or the nature of the material on which the document is written, can change the shape of the character and complicate the recognition problem [4]. Moreover, manuscripts in the libraries of Jerusalem have suffered great damage in the process of their preservation, which is not surprising in view of their age and the conditions under which they have been kept.

All these reasons make chose digitalisation in mode image, despite the evident shortcomings of this technique. As J. Bouchard points out: "Le mode image est indispensable lorsque des dessins, des formules scientifiques, des

manuscripts, des travaux préalables à l'écriture interviennent dans l'appropriation du document" [5]. At the same time, digitalisation in mode image is more difficult to manage and requires more space for storage. J. Bouchard notes that for a book of 300 pages, 20 million bytes are required in mode image, while the same book occupies only 600,000 bytes in mode text. However, despite these disadvantages, digitalisation in mode image has, on the other hand, undeniable advantages as applied to documents whose value is not only in the text, which is precisely the case of the Arabic manuscripts. The same author states that mode image is also preferable to other modes because it shows the original state of the document. Of the Bibliothèque Nationale de France digital collections 90% of the books were in mode image, and only 10% — in mode text. Digitalisation of ancient documents in mode text is very unsatisfactory, while in mode image it gives a faithful representation of the printed page as it appears on the page. It also well represents the form and even the defects of the paper or the parchment. This is very important in the case of manuscripts, where each detail of form, presentation and physical state can be important for researchers.

6.2.2. Equipment

Digitalisation requires two types of equipment. In order to carry out the operation itself a scanner to make images of the manuscript that show its physical characteristics, especially for parchment which is very sensitive to environmental conditions such as temperature and humidity is needed. This scanner must have a camera with the following characteristics: (i) great sensitivity to colour in order to take coloured image without necessitating a quantity of ultraviolet luminous rays that would damage the originals. This type of camera has to be equipped with a very efficient colour filter in order to give an exact copy of the content of the manuscripts; (ii) good adaptability in order to be able to focus on the whole page because of numerous marginal notes. Also, the scanner must be numerical so that it could capture several images because sometimes the manuscripts contains illustrations of different sizes or diagrams; (iii) a support device allowing to alter the position of manuscripts during the digitalisation process so that not to damage the manuscripts bindings. Bindings of manuscripts, in turn, pose problems due to the variety of their sizes and thickness.

Digitalisation requires a "Copystand / easel" to place documents on, to obviate the need to hold manuscripts manually, as not all manuscripts have the same thickness of pages throughout. During the digitalisation process it is necessary to refocus the scanner for each page. This process requires that a sheet of glass is placed over the manuscript in order to flatten the parchment and to allow a good view of the whole page.

To make use of a digital document, a "computer-assisted reading post" is needed, which in turn requires additional equipment in order to function properly, such as printer to make copies, an external computer for typing, and a server to connect the digital manuscripts to the Internet (Daniel Renoult of the Bibliothèque Nationale de France estimates that the memory capacity of a server capable of serving 100 readers is 100 gigabytes).

To conclude, although this study is limited to five libraries, its results can be generalised to include the other libraries which have manuscripts collections in Jerusalem. This is because the five libraries under discussion are typical

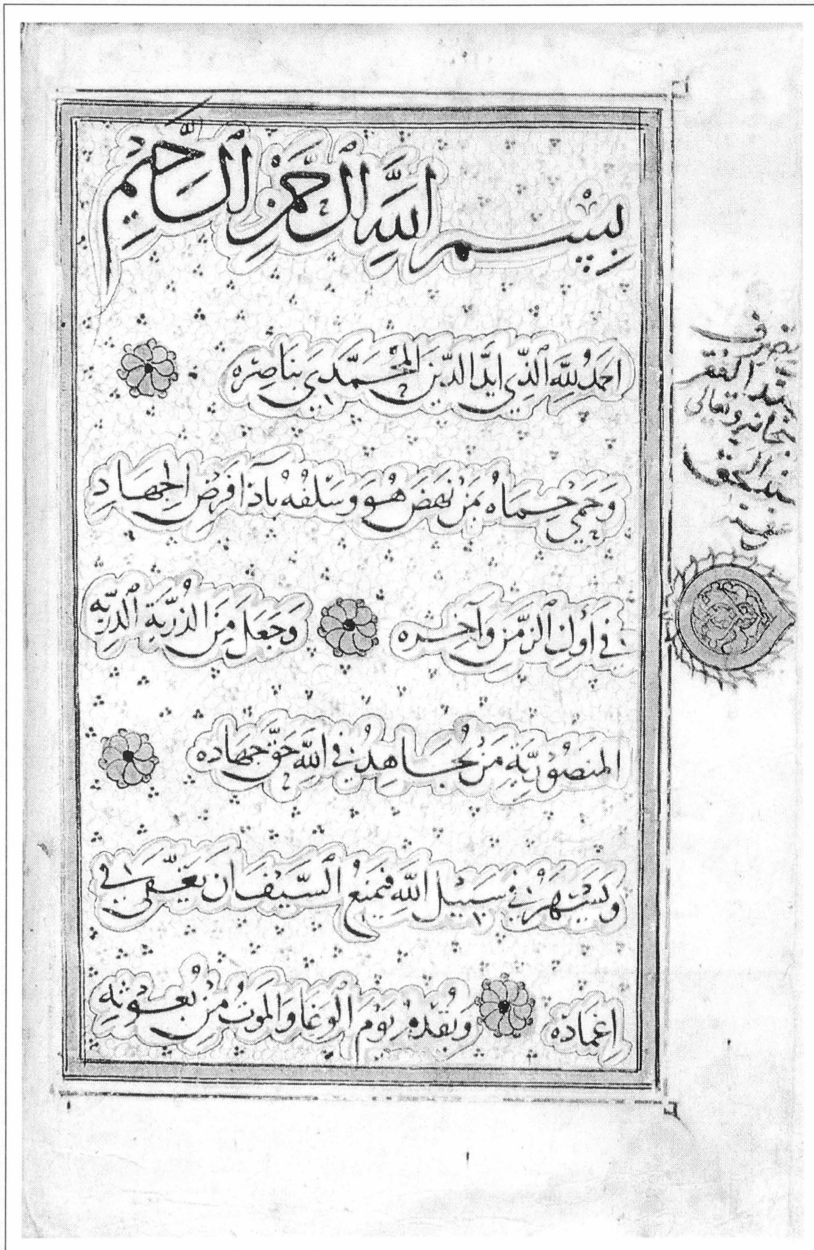


Fig. 1

of Palestinian libraries. It is also because the size of the corpus studied is large enough to represent the techniques and scientific and historical characteristics of all Palestinian manuscripts. Digitalisation of the Palestinian manuscripts is absolutely necessary for the reasons of their conservation, and accessibility, not to mention the political risks noted above.

Such a project can be achieved only with a great deal of support both at the national as well as the international level. This would include finances, scientists (software), personnel (training), infrastructure (equipment). Among the international organisations of help in such projects is UNESCO, but there are other organisations more specialised, like ALECSO and ISESCO. A good example of such assistance is UNESCO's program "Mémoire du Monde", which aims at safeguarding and promoting the national heritage in danger as a result of political instability, by the use of new technologies.

The manuscripts of Jerusalem fit perfectly the criteria to be supported by this program. The national participants,

notably the professionals and the proprietors interviewed, have shown a clear willingness to take part in this kind of a project. Nevertheless, they insist on the necessity of this project having a global approach that takes into consideration all aspects of the problem: costs and benefits, judicial aspects, technical and scientific aspects related to the contents of manuscripts, etc.

This research cannot be completed without some consideration of the means of disseminating the manuscripts after their digitalisation. The network, and in particular the Internet, would appear to be the key to this problem. The network is effective in particular at the level of the distribution. In order to diffuse digitised document, the Palestinian libraries have two options. The first is that they unite their digitised data in one database. It is obvious that co-operating in this kind of shared database would reduce the cost and would strengthen the libraries when they negotiate with powerful world servers. The second option is that each library insures its presence on the Internet for itself.

Notes

1. U. Haarmann, "The library of a fourteenth century Jerusalem scholar", *Dar Majalat al-Athar*, II (Zahlah), p. 438.
2. *World Survey of Islamic Manuscripts*, general ed. Geoffrey Roper (Lobdon, 1993), ii.
3. See E. A. Rezvan, N. S. Kondybaev, "The ENTRAP Software: test results", *Manuscripta Orientalia*, V/2 (1999), pp. 58—64.
4. See *Correspondence Round Table: Arabic/Farsi OCR in Manuscripta Orientalia*, I/3 (1995), p. 47.
5. J. Bouchard, "Des puces, des livres et des hommes futuribles" (1996), p. 26.

Illustrations

- Fig. 1.** A sample of ornamented *naskh*, *al-Rawd al-zāhir min sirat mawlānā al-Sultān al-Malik al-Nāsir* (The Blossoming Garden from the Life of Our Lord, the Sultān al-Malik al-Nāsir) by anonymous author, manuscript B 623 in the collection of the St. Petersburg Branch of the Institute of Oriental Studies, Egypt, 14th century, fol. 2b, 22.0 × 15.5 cm.