Microfilming and Document-Image Processing. Preservation Reprography Program of Historical Archives at the National Bank of Greece

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Introduction: Preservation activities of the Historical Archives, National Bank of Greece (H.A./NBG)

The National Bank of Greece, founded in 1841, is the oldest and largest bank operating today in Greece. It began life as a private discount and mortgage institution with the exclusive right to issue bank-notes. Over the course of its 161-year history, the bank's activities gradually expanded to encompass the full range of credit and financial services. It established itself throughout Greece, and in time expanded internationally to eighteen countries in four continents. The Bank developed the National Bank of Greece Group, which, besides playing an essential role in the domestic economy, today constitutes a major financial force in the Eastern Mediterranean and the Balkans.

Since its foundation, in 1841, National Bank of Greece has always been aware of the importance of the preservation of its records. In an organisation chart drawn up in just the second year of the bank's operations, Georgios Stavros, the Governor of the Bank at the time, specifically assigned responsibility for the proper maintenance and safekeeping of the records of the Bank.

Indeed, the Bank's concern for the safekeeping of its archives is apparent from a number of initiatives taken by the bank over the 161 years of its history. For instance, in 1894 NBG published an inventory of its general archives, and the 1920s saw it build the first purpose-built archive in Greece. NBG's desire to make full use of its extensive archives for, inter alia, historical reasons was made clear from 1938 onwards. In 1938, as part of the Bank's preparation for its upcoming centenary celebration in 1941, the decision was taken to create a separate Historical Archives Department. Following the outbreak of the Second World War the department's work had to be suspended, and was not resumed until 1962. The work of the Historical Archives was suspended once more following the 1967 military coup, but the department was brought back into service in 1977. The H.A./NBG was assigned the tasks of modernising the management of the records within its jurisdiction (1841 - 1940) and of ensuring that the records in its possession were made fully available to interested academics. This formed part of a large-scale banking and economic history research project, which led to the publication of 36 monographs and the organisation of fortnightly seminars, which were attended by a substantial number of younger academics. Although modified in various ways, this research project is still under way.

The archives of the Bank have always been among its priorities. However, the importance placed on the archives in the age prior to the emergence of modern concepts of archive management and utilisation indicates an increased awareness reflecting the presence of an 'archive culture', at least among NBG's management.

The main task of the H.A. was to implement an archive preservation program to ensure adequate protection of the records of the Bank whatever their date, form or appearance, which are no longer in service, i.e. have ceased to be needed for current business. These records were preserved, either as evidence of origins, structures, functions and activities or because of the value of the information they contain for access by present and future generations of researchers and academics.

Information contained in the archives of the bank was considered to have fundamental and continuing value for administrative, fiscal, legal, evidential or historical purposes. By safeguarding the archives of the Bank, it was able to safeguard a part of the country's cultural heritage. The archives of NBG are extremely important for the economic, social and political history of Greece since the Bank is not only the largest bank operating in the country but was also, until 1928, the 'central bank', administering all the finances of the Greek state. If it had not been recognised early on that certain records of the bank were worth saving for posterity, NBG's historical documents would have survived only by accident.

At the same time, the executives of the Bank admitted that the archives should be accessible to the public for research purposes, thus making their preservation meaningful.

Underlying this general principle are a number of assumptions. Firstly, the principal aim of the Archive is to make its material available for use, and not merely to preserve it. Secondly, preservation concerns information and knowledge. Thirdly, the word 'adequate' implies that there is no ultimate or perfect solution to the preservation challenge and that there are ways to approach solutions.

The goal of preservation is that records in archival custody do not deteriorate and that they are protected in order to survive as long as possible. Here we have to distinguish between two different activities. Those that prevent or significantly retard deterioration (Preservation) and those that address damage that has already occurred (Conservation). Archival records deteriorate due to a number of interrelated factors, including the chemical and physical stability of specific materials, storage under adverse environmental conditions, and such external causes as excessive or careless handling, and loss or destruction brought about by human-induced or natural disasters.

In the context of its preservation program, the H.A./NBG has taken a wide range of appropriate measures over the years:

1. The H.A./NBG conducted a series of periodical surveys of the archival repository's microenvironment in order to take appropriate measures to con-

trol and eliminate as far as possible variations in temperature, relative humidity, light, dust, gases and pests, in collaboration with institutions and companies specialising in conservation matters. The results of these surveys prompted the Bank to finance the renovation of the building that as of this August houses the Historical Archives. The environmental conditions of the Archive are now monitored on a 24-hour base.

2. The H.A./NBG conducted surveys assessing the scope and nature of deterioration within collections. These controls were conducted in collaboration with other institutions. To give one example, the H.A./NBG proposed that the Laboratory of Organic and Environmental Technologies (at the National Technical University of Athens' Department of Chemical Engineering) study the archival material contained in its collections and determine the causes (including humidity, heat, light and air pollution) and degree of paper deterioration. In order to diagnosis the problems relating to ageing of paper-made archival materials the Laboratory carried out multivariate, fluorescence spectra-based analysis. This research, which is still under way, has produced interesting results as to the preservation conditions existing in the repositories of the NBG in comparison with the conditions existing in the Greek National Library. The results of the research enable us today to assign dates to undated papers within our collections.
3. Preparing contingency plans in case of fire, flooding, storms, earthquake and other natural or human disasters.
4. To obtain storage systems that protects records.
5. To establish policies on use of holdings by patrons and staff via the use of micro-reproduction and information technology to avoid frequent and indiscriminate use and handling of records.

Here we shall describe the use of Micro-reproduction and Information Technology by the Historical Archives Department in order to produce copies of the records in other formats so as to allow the H.A./NBG to

1. Avoid possible damage from improper handling by providing researchers with copies of the archival material in other formats.
2. Minimise the possibility of losing valuable information in the event of a natural disaster (earthquake, fire, flood etc.) by keeping duplicates of the archival material.

Microfilming

A few years after reopening, in 1980, the Historical Archives Department of National Bank of Greece adopted a photographic program to produce reduced-size images of textual or graphic material on film of its records, which over the years since then has evolved to adapt itself to technological changes.

The micro-reproduction program adopted then, after a thorough assessment of its needs conducted by the Historical Archives Department in collabo-

ration with the Bank's Organisation Division, was planned mainly to serve two distinct roles in the Historical Archives. It was introduced as a preservation technique that would gradually allow the Historical Archives to obtain safety copies of the records, which could be stored separately and thus protect the Historical Archives from the possibility of losing valuable archival material in the event of natural disaster. It was also introduced to enable the Historical Archives Department to withdraw the most valuable, vulnerable or used records from regular use and substitute copies. Although microfilming is an expensive undertaking and diverts considerable resources from other, important tasks, the Historical Archives adopted the project in the belief that it was an important step towards securing its collections.

Of course microfilming is not a solution to all archival problems. It certainly will not improve access to poorly organised records, and indeed, will make them even less accessible, since it is generally harder to browse through microfilms than through hard copy. This means that, before microfilming, the archival staff must thoroughly appraise, arrange and describe the material. We also have to face the fact that researchers and the public in general do not like viewing microfilms and prefer to see the original material.

Making a collection camera-ready, as experience has shown (and described in the Archives Microfilm Manual published by the Research Libraries Group Inc. in 1994), also includes such activities as:

1. Unfolding and flattening material
2. Weeding or flagging duplicates and other material that wont be filmed
3. Removing fasteners and attachments
4. Disbanding items with very tight gutter margins
5. Removing surface dirt, mold, tape, and other blemishes that obscure the informational content of documents
6. Repairing or enclosing in polyester sleeves items that would otherwise be too fragile or fragmented for filming
7. Determining reel breaks
8. Creating and inserting targets to convey information to the film user and special instructions to assist the camera operator during filming.

Preparing material for filming is a time-consuming and expensive process that involves a number of staff.[1]

As Nancy E. Elkington and Gary M. McLerran explain, archival material also presents various obstacles to efficient microfilm production that typical library material does not present. "The most significant difference lies in the non-linear nature of archival material. Although printed volumes come in all shapes, sizes and colours they nevertheless are internally sequential and predictable in nature. To a large extent, once the camera operator has

[1] Anne R. Kenney, "Preparation of Materials", Archives Microfilming Manual, The Research Libraries Group Inc, California 1994, p. 26 - 27.

established the settings appropriate to the volume in hand, he can often film all 50, 100, 500, frames without further adjustments. Such a situation permits the operator to develop a pace that facilitates fast and accurate work by experienced staff. Developing a fast and even pace is not normally possible when filming archival collections. Instead, the camera operator must assess nearly every item as an individual piece and consider a number of variables before exposing each frame of film:

1. Position of a single item on the film surface in accordance with size and shape
2. Position, organisation of multiple items (e.g. loose clippings) on the film surface
3. Shape of frame on film depending on item position and size
4. Necessity for inter-leafing or backing to minimise effects of show-through and bleed-through
5. Lighting and exposure based on contrast
6. Degree of existing or potential damage due to fragile condition".[2]

The H.A./NBG, after carefully examining the needs that existed, the resources required and available to meet those needs, and after examining different options, decided to perform, in house, all tasks associated with the preparation of the materials to be microfilmed as well as the actual filming. This decision was taken principally in order to avoid having to transfer the archival material elsewhere outside its repository. The microfilming project included:

1. Production of a master negative
2. Creation of a duplicate copy for use

To achieve these goals the Historical Archives had to possess adequate storage and laboratory space, purchase microfilming cameras, a film developer machine, a duplicator, reels, storage materials, identification and labelling materials, microfilm readers and printers.

The first four cameras purchased (RECORDAK STARFILE MICROFILMER RV-2) using 16mm roll film soon proved to be inadequate for the purpose, because they could not film documents bigger than A4 size, which is not the most usual size for documents of the 19th and early 20th centuries. Only the planetary Kodak camera (RECORDAK MICRO-FILE-MACHINE MOD.MRD.-2) using 35mm film covered the quality of microfilm needed. Film used for the master negative is the KODAK Imagelink (H.Q.Estar Base ISO10602). We needed also to acquire a film developer machine (MARPLE) and a film-duplicating machine (REAL). Film used for the production of a duplicate negative is the KODAK Direct Duplicating Microfilm 2468. We also needed to acquire a Canon microfilm reader printer, and four Dukane microfilm readers.

[2] Nancy E. Elkington and Gary W. McLerran, "Microfilming Archival Documents", Archives Microfilming Manual, The Research Libraries Group Inc, California 1994, p. 52 - 53.

By 1996, the Historical Archive had microfilmed 95% of the archival material in their holdings dated until 1900 and 60% of the material in their holdings dated until 1940, producing around 3,000 reels of film.

Microfilming and/or digitisation of archives. Preservation and/or dissemination of digital images and information

In 1996, the Historical Archives decided to review the microfilming project and to take in consideration the evolution of computer technology and the possibility of using Electronic Data Processing in archival operations.

The developments in data and network technologies, with their constantly improving capacity for the transmission of document images, opened the way for new forms of uses of the archives which we realised needed to be incorporated into our Archive preservation program.

The question raised at that point was the following. Should the Historical Archives of the National Bank of Greece continue to microfilm or opt for the digitisation of the collection? We asked our collaborator on information technologies, Mr. G. Mitrofanis, to investigate the problem, in collaboration with our archivists, and to prepare a report on the advantages and disadvantages of each technological solution presented.

The report, which took into consideration international research on the subject, was submitted a few months later and concluded that there was a necessity to perform both tasks. According to the report, the Historical Archives should computerise its archival operations. The report added that "the system should be capable of operating in a local computer network supporting the electronic processing of the whole range of in-house archival operations: access, classification and description, inventory control and retrieval of archival material. The design of the system's databases and tables should comply with internationally accepted standards for archival description. The system should support the production and dissemination for digital images of primary archival material. The system should secure the authenticity and safety of the disseminated digital images. The system should allow the compilation and maintenance of electronic search aids. These search aids should link to digital images of primary archival material. The system should provide access to finding aids, and correspondingly to the digital images of the original archival material, by means of a common end-user interface".[3]

[3] George N. Mitrofanis, "Encoded Archival Description (EAD) and the dissemination of historical information.The application of EAD in the National Bank of Greece Historical Archives. Proceedings of the DLM-Forum on electronic records. European citizens and electronic information: The memory of the Information Society, p. 271 - 279

The report also pointed out the need to continue microfilming for preservation reasons. As international experience has shown, archival material should be filmed before digitisation for two main reasons.

1. For safety reasons as it is a medium that under proper environmental conditions can be preserved for many years and can be easily duplicated
2. For quality reasons as digitisation of the original and then printing on microfilm involves a notable reduction in quality

As the European Commission on Preservation and Access pointed out in its publication "Digitisation as a method of Preservation", "image conversion of endangered archive material to other media, for protection and/or for permanent replacement of the original medium threatened by deterioration, requires systems which produce, over very long periods of time, the highest possible reproduction quality, availability and access, together with economy". In this perspective "microfilm has the advantage, in comparison with other modern information media, that the material undergoes no fundamental technical transformation and is thus "future-proofed". The analogue-stored information is directly accessible, with relatively little effort to the human eye. Increasing national and international compatibility of microfilming systems ensures acceptance across frontiers. Further, microfilm can also be efficiently digitised with microfilm scanners. As an analogue and ageing-resistant storage medium, whose accessibility can be maintained with relatively small resources over long periods of time, and which remains available at all times for further processing in digital systems, microfilm has its place in the digital media world".[4] Thus, the European Commission on Preservation and Access advised in its 1997 edition on digitisation to film archival material before digitisation from the resulting microfilm. It insisted "that this remains true on financial grounds even when the only concern is digitisation of material for new levels of access and use. Microfilm, as a compatible long-term storage medium, justifies over long periods of time the resources invested in its preparation and handling. Heavy expenditure for data migration and frequent technical and organisational measures to preserve readability in new system environments of material only available in digital form can thus be avoided".[5]

These conclusions led the Historical Archives of National Bank of Greece to adopt the following procedures:

1. To continue microfilming. To achieve this task and to improve microfilming quality the Historical Archives decided to replace the existing camera with the purchase of two new technologically advanced microfilming cameras (ELKE SENATOR)
2. To purchase two Bell-Howell 3200AD film scanners in order to digitise the already existing microfilms and those which would be produced in the

[4] Hartmut Weber, Marianne Dorr, "Digitization as a Method of Preservation", ECPA 1997 p. 3
[5] Hartmut Weber, Marianne Dorr, "Digitization as a Method of Preservation", ECPA 1997 p. 3

future, and to store the images in the computer information system of the Historical Archives
3. To purchase a Static film cleaner for periodical cleaning of the microfilms
4. To purchase an Ultrasonic Film Splicer to repair damages

From 1996, until August 2000 when the H.A./NBG temporarily closed due to the fact they had to leave the repository and move to the new building under renovation we had produced 1.000 microfilms (more than 4000 with those produced between 1980 - 1996), and digitised rames.

Readjusting the digitisation program

In view of the results obtained during the last 6 years in digitisation of microfilms, the Historical Archives have concluded that there is a need to readjust the digitisation program adopted in 1997. We realised that the digitisation of already existing microfilms was a very time-consuming task that would demand many years of work for the existing staff in the archives before the microfilms already existing could be digitised.

The Historical Archives decided:

1. To upgrade its technical equipment by obtaining new microfilm cameras which would simultaneously microfilm and digitise original material thus saving precious work time. We have opted for the purchase of two ZEUTSCHEL OMNIA OK 300/OK301 cameras with backlight table DTO and glass plate drawing holder with the appropriate software (Powerfilm) to digitise microfilms produced
2. To upgrade its microfilm scanners by purchasing two KODAK 3000DSV microfilm scanners
3. To upgrade its microfilm readers by purchasing 2 readers ZEUTSCHEL OMNIA OL2/OL3
4. To entrust the digitisation of already existing microfilms to a professional firm

In order to charge a professional firm with the digitisation of its microfilm collection, the Historical Archives will develop a 'Request for Proposals' project (amount to be filmed, schedule parameters, etc) for prospective vendors, then mail this to at least three agents with a deadline for the submission of bids. Ultimately, the repository will have to justify its selection of a vendor, and that this decision will be based on the combination of price, product quality, and prospects for a productive working relationship.

Costs for contracted services will have to be carefully considered. To obtain an accurate figure for the digitisation services, the institution will provide the number of microfilms to digitise. Communication between the Historical

Archives and the company will be full and clear in every detail. To digitise existing films it is advisable that we undertake a thorough analysis of the films (material, state of preservation, reduction factor, reproduction quality, filming technique, nature of material, organisation of the filming). This analysis will be undertaken in co-operation with an experienced service provider. Before any award of a contract, digitisation tests will be carried out with standard test material. It is only on such a basis that a firm can arrive at a realistic price, which will include the possibility of improvement through treatment of individual parts of the film and image enhancement. Any damage to the film, such as scratches, dirt or fraying, will also influence the result of digitisation.

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