

PRESERVATION AND CONSERVATION OF INFORMATION BEARING MATERIALS

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ABSRTACT

A library is a repository system through which the wisdom of great thinkers of the past and the present anchor. The importance of any library in the building of its collection is to enable it achieve its objectives which are mainly to conserve and preserve recorded information, to organize and to disseminate such information without any discrimination. This study is therefore poised to examine the preservation and conservation of information bearing materials. During the course of this study, it was revealed that the academic healthy intellectual vitality and effectiveness of any institution depend largely upon the state of health and excellence of its library. This notwithstanding, the study highlighted the breakdown of information materials in libraries and information centres especially books materials as the fundamental problem currently incapacitating libraries and information centres from meeting the information needs of the clientele. Consequently, amidst others it is recommended that there should be training programmes for the information handlers/users such as librarians, archivists, and information technicians on preservation and conservation management.

Keywords: *preservation, conservation, information, materials*

INTRODUCTION

The holdings of libraries are the priceless heritage of mankind as they preserve facts, ideas, thoughts, accomplishments and evidences of human development in multifarious areas, ages and directions. The past records constitute a natural resource and are indispensable to the present generation as well as the generations to come. Any loss to such material is simply irreplaceable. Therefore, preserving this intellectual cultural heritage becomes not only the academic commitment but also the moral responsibility of the librarians/information scientists, who are in charge of these repositories. Besides, proper dissemination of information materials is possible if the documents are in good and usable condition. This demand for the proper preservation and conservation of these materials. Any librarian responsible for the

preservation of this documentary heritage should know the various causes of deterioration of information materials and the possible methods for their preservation. The success of any institution rests squarely on the adequacy of the institution's library collections because the library is also seen as an agency for scholarship and research. It is the heart of any institution. The academic health, intellectual vitality and effectiveness of any institution depend largely upon the state of health and excellence of its library. The library is a social institution charged with the responsibility of disseminating knowledge to the people without any discrimination (Buchanan, 1994).

Basically, the primary issues in preservation and conservation are the need to prolong the life of printed and non-printed materials by taking appropriate preservation and conservation measures that retard the deterioration of materials. These materials include books, journals, periodicals, newspapers, technical reports, manuscripts, maps, pamphlets and prints, conference papers of learned societies and professional associations as well as photographs. These materials should be made available to users at any point in time but unfortunately, most of them are deteriorating and the problems of preserving them becomes acute because of many enemies of information materials such as acidity, insects, fungus, darkness, light, heat, dust, polluted air, man himself and natural disasters such as fire, flood and war. No librarian or archivist today can shy away from the fact that the information world stands the imminent risk of losing so much of its valuables.

This situation is more alarming in most tropical African countries where a large number of documents are in the advanced stages of deterioration due to the interplay of factors not very prominent in the temperate countries. Paradoxically, these are the countries where the awareness of preservation and the training of conservation personnel are accorded low priorities. There is therefore an urgent need for active conservation and preservation program to enhance survival of collections for future purposes.

IMPORTANCE OF PRESERVATION AND CONSERVATION OF INFORMATION MATERIALS

The breakdown of information materials in libraries and information centres especially book materials is currently identified as one of the fundamental problems incapacitating libraries and information centres from meeting the information needs of their clientele. The deterioration of information materials is on a broad spectrum, affecting such a great volume of materials in libraries in Africa. It arises from factors such as the quality of the environment in which these information materials are stored, the way they are handled, increasing level of usage and the process of decay inherent in the materials themselves. Maravilla (1994) states that preservation includes all the managerial and financial considerations including storage and accommodation provisions, staffing levels, policies, techniques and methods involved in preserving library and archival materials and the information contained in them.

Edem and Feather (1997) in a study carried out on preservation and conservation arrives at the conclusion that preservation is a cord that runs through the activities of a library. Preservation includes all the protection, maintenance and restoration of information materials. Preservation involves direct and indirect actions. In preservation and conservation, consideration is given to every element that promotes the protection of materials including the housing, storage system and security against such threats as theft, mutilation, and poor handling. Smith (1994) sees preservation as a major concern for librarians and documentalists. For a very long time in Africa, especially Nigeria, it is commonly difficult to accept the fact that large amount of documents and records are reaching the end of their natural life and the few years that they have left can only be prolonged by proper handling and careful storage. It is only recently that information professionals in Nigeria realize the urgent need for establishing preservation and conservation programmes, as well as develop strategies for managing their information materials.

Preservation and conservation of information materials ensure continued supply of information essential for documenting the history of a nation and also aiding research. It is the view of many librarians in Nigeria and other countries that we owe as much responsibility to the future generation as we owe to our present clientele. In view of limited financial resources, much emphasis should be placed on the preservation of collections to the same extent as we are concerned with acquisition and service to clients. Okegbola (1997) writing on the importance of preservation notes that aside from the historical and artistic values, the global economy is on the downward trend and developing countries such as Nigeria is adversely affected. Thus, replacement of destroyed materials becomes extremely difficult.

Furthermore, he went on to state that certain materials and information contents are termed 'rare' and 'unique.' Such materials are hard to come by even when the finances are available; hence the need to guard them carefully and jealously. Information materials are sources of reference, research illustrations, effects etc. Their re-recording may be impossible as certain actions and events cannot be re-enacted, the dramatic personnel involved may die, particular material may be the only one available in a given geographical area and the cost of preservation may be "peanuts" compared to the cost of replacement. Man, the creator of recorded information is mortal. Similarly, the deterioration of information materials is inevitable. All that is intended in conservation is to delay the inevitable so as to satisfy the information needs of users.

PRESERVATION AND CONSERVATION PROBLEMS IN LIBRARIES AND ARCHIVES

Rosenberg (1993) has a strong conviction that everyday care of library books should be given a special emphasis in preservation measures taken by libraries and information centres. This conviction is derived from the fact that the quality of care and handling ultimately contributes to the longevity of the book. The problem of

preservation and conservation has been on since time immemorial. Nzotta (1982) rightly says that the problem of deterioration and preservation of information materials is not a recent phenomenon. He asserted that it has been in existence since books were invented and libraries were first established. Rosenberg (1993) also notes that everything in library collections is deteriorating today, was deteriorating yesterday, and will continue to deteriorate tomorrow, although there is a need to retard the process. Alegbeleye (1996) in a study on the practice of conservation of information materials concludes that there was a lack of technical expertise; librarians were not well informed about preservation and repair of these materials and for any programme to succeed, there is need to have trained manpower. Conservation and preservation is a specialized field that requires staff that understand the chemical nature of the materials in their custody.

Inappropriate Building: Information materials are prone to deterioration if not kept within an environment that is stabilized. The problem of inappropriate building is common. A number of libraries adapted premises to house their collections. Information materials housed in such premises will not receive adequate protection against loss, decay and destruction through humidity, light, insects, fire and theft. Inappropriate building could bring about the following problems:

Noise: Researchers cannot concentrate due to noise from vehicles.

Dust: Affects records especially during dry season.

Security: In the event of riot or civil unrest, records are likely to be damaged or vandalized.

Pollution: Results from exhaust fumes of taxis and buses.

The Economy: The economic throes which Nigeria has been passing through for the past two decades or more affect libraries and their operations. The government would for example be more comfortable resuscitating her ailing industries than to engage in the "frivolity" of buying air-conditioners and other inputs for information processing and preservation.

Lack of Disaster Control Plan and Documented Conservation Policy: A disaster plan is an important tool in any organization. The absence of such a plan implies that in the event of a disaster occurring, an information centre would not be in a position to respond to the disaster with the urgency that is required. Alegbeleye (1996) argues that libraries are prone to disasters that can be classified broadly as natural and man-made and they include fire, flooding, vandalism, civil unrest, earthquakes, volcanic eruptions, war, lightening and to some extent rodents and pests.

Lack of Trained Conservators: For any program to succeed there is need to have trained manpower. Conservation is a specialized field that requires staff who understand the physical and the chemical nature of the material in their custody. The department of archive and records management should offer more specialized courses in conservation to solve this problem.

Political Constraints: It is highly unlikely that attention can be directed to preservation under a condition of instability. Could we talk about conservation and preservation in the era of armed struggle? Even cultural heritage becomes targets for destruction during armed struggle.

CAUSES AND AGENTS OF DETERIORATION OF INFORMATION MATERIALS

Acid is the archenemy of librarians because it is a direct cause for hydrolysis. Hydrolysis is a chemical product. As time goes by, acid contaminated paper loses its strength and becomes increasingly brown, stained, and is eventually embrittled to the extent that it cannot be handled without crumbling. The pH value is a very reliable measure of acid content. pH is a measure of the hydrogen ion concentration of a substance. Acid has pH below 7, (1-6) while alkaline has pH value above 7 (8-14). According to Walker (1985), pH establishes a direct correlation between paper acidity and longevity. The more acidic the paper, the more short-lived it is. While expressing the difficulty in specifying an exact limit of pH value below which rapid acidic deterioration may take place, Alegbeleye (1996) agrees with other investigators that for permanence, pH should not be below 5.4. In other words, pH of 5.4 and below is considered as being very acidic.

Brittleness of Documents: Research has confirmed that brittle paper documents are very difficult to repair or bind and most often cannot withstand photocopying and heavy use. Brittleness may result from desiccation caused by high temperature among others. According to Walker(1985), the test for brittleness is fairly simple and objective. Alegbeleye(1996), refers to it as the fold endurance test which considers the number of double folding as a measure of brittleness. The book was considered very brittle if it broke after two double folding.

Humidity: Relative humidity is defined as the amount of water vapour in a volume of air expressed as a percentage of maximum amounts that the air could hold at the same temperature. The warmer the air, the more water vapour it is capable of holding. Thus, the relative humidity decreases. Humidity causes problems if it is either too high or too low. High humidity speeds up deteriorative chemical reactions. Under conditions of extremely high humidity, water-soluble ink can offset and coated papers can stick together. Low relative humidity causes materials to become dry and brittle. Paper that is dried out can break and crumble as it is handled and flexed and covering materials on books such as vellum and shrink, causing boards to warp (Alegbeleye, 1993).Relative humidity below 45% endangers paper. On the contrary, relative humidity above 65% will lead to an abnormal increase in biological activity, since fungi starts growing above the 65% level and insects flourish at higher humidity. Furthermore, excessive humidity also acts upon the fibre of papers, softening them and diluting certain inks used to write documents.

Temperature: Paper deteriorates as a result of complex chemical reactions. It is a fact in the physical sciences that most, if not all chemical reactions vary directly with temperature. They are speeded up at higher temperature and slowed down at a lower temperature. Researches have confirmed that for every increase of 10 degree centigrade in temperature, the rate of chemical activity greatly doubles and thus the rate at which paper deteriorates also doubles. This presupposes that if paper materials are stored at low temperature, their life expectancy will be significantly lengthened. Papers stored at high temperature are also known to have suffered from physical breakdown, change in colour, etc. High degree of temperature is also known to accelerate the rate of biological activity (insect and mould).

Discolouration and Staining: Paper documents overtime, get discoloured as a result of the interplay of several factors (Walker, 1985). The most prominent cause is the reaction of radiant energy with lignin if present in the paper. This darkens the colour of the paper, turning it brownish or yellowish. Discolouration results in the reduction of legibility and makes reproduction fairly difficult.

Light: Light is very vital in the provision of services in libraries and archives, as much as possible, materials have to be identified and read. On the other hand it is one of the greatest enemies of materials especially paper. In any library or archive, there will be both artificial light (controllable) and natural light (less controllable). All types of light contribute in a way to cellulose degradation and fading of pigments and dyes. It speeds up the oxidation of paper and thus its chemical breakdown. It causes paper to be yellow or brown. Certain portions of the light spectrum are more harmful than others. Light is the most important cause of fading in information materials (Alegbeleye, 1996). The problem associated with fading of books is traced to the use of unfiltered fluorescent light and the effect of sunlight. Many libraries and information centres, unaware of the insidious effects of fluorescent lighting systems, use them because they provide greater illumination than the incandescent lighting system.

Atmospheric Pollutants: These constitute a major cause of deterioration of information materials (Maravilla, 1994) certain chemical compound are being formed in the air in a natural way, but man adds also an enormous quantity of these and other compounds to the air. When concentration becomes inconvenient, one talks about atmospheric pollution. It is being caused as well by waste products of industrial origin as by exhaust fumes from cars and combustion of house heating products. The concentration of these products is variable with the season of the year, the implantation of industry, density of traffic and weather conditions. Very noxious products are sulphur dioxide, carbon dioxide, nitrogen monoxide and dioxide. They react with water to form acids, accelerate hydrolysis in different materials. They

also react with other chemicals, which are basic components of library and archival materials. Ordinary dust contains all kinds of materials that can be abrasive, soiling and damaging information carriers. Moreover, it is mostly a good breeding ground for all biological agents.

Dust and Dirt's: Dirt, dust and other solid particles can damage materials through abrasive action. Fine dry particles of any matter present in the air are known as dust. Dust, which is highly dangerous for the library and archival collection, composed of soil, metallic substances, fungus spores and moisture among other things. Since dust is air borne, it settles down on any surface of the object. Dust is hygroscopic in nature and when it is mixed with high humidity, it is transformed into dirt and if this dirt sticks to the surface of the books, it becomes difficult to remove. Dust and dirt are sources of both physical and chemical degradation of information materials. Dust acts as a nucleus around which moisture collects and this moisture provides the necessary humidity for growth of fungus and for chemical reactions, which lead to the formation of acids. Since dust and dirt are solid particles of varying size and hardness they exert abrasion on the surface of the books.

Water: Water occurs in all the normal state of matter, solid, liquid and gas. It acts as a physical agent of deterioration by causing hygroscopic materials to undergo dimensional changes. Water, which is harmful to information materials may come from sources like natural calamities, human negligence, leaking roofs, defective plumbing and through open windows during rainy season. Excessive water brings about biological attack on paper, which is usually manifested as the growth of fungus or mildew. The effects of water are stained paper, rooted leather, smeared ink; weaken adhesive, sustained fungi etc. Water also does injury to steel furniture due to rusting.

Disasters: Disasters whether brought about by human error or natural events, pose the ultimate threat to collections. The results are immediate, calamitous and dramatic; unlike the slow and insidious process and deterioration that takes place in boxes and filing cabinets. Disasters, which can result from fire, flooding, storms, earthquakes or broken steam pipes, can damage or destroy a few items or entire collections. Vigilance, preparedness and recovery plans are the best guards against loss from disaster (Alegbeleye, 1996). The best response to all of the factors threatening archival collections is informed action to protect and safeguard materials from the hazards of a hostile environment. A controlled environment and proper storage procedures are important component in library and archival preservation programmes.

Insufficient Space: It stands to reason that the more crammed and cluttered the storage area is, the greater the risk of deterioration through breakage, abrasion, poor maintenance, loss and neglect in general. Furthermore, a disorganized, confused and unsystematic collection cannot be used effectively and this negates the reason for

having the collections. Whereas it is difficult to create space when it is limited, additional storage can be created through more efficient use of space. Space usage should be carefully planned and effective space saving measures should be sought constantly.

Biological Agents/Factors: Maravilla (1994) states that where there is condensation or moisture due to high humidity, there is always the presence of biological growth such as contained in proteins and carbohydrates in the form of sizing, paste or starch and other organic substances attractive to insects. The nature and extent of the damage depends not only on the insect and material but also on how promptly the infestation is discovered and controlled. Damage may vary from a few holes to complete destruction. The most common types of insects that attack paper are: Termites, Silverfish, Cockroaches, Booklice, Bookworm or Book Beetles.

The Human Factor: The greatest enemy of information materials is the librarian or archivist who neglects his collections in the quest for ever more efficient management systems (Adams, 1973). People pose the most constant threats to archival collections . Abuse, whether imposed by archival staff or users, intentional or not, results in the same damage and loss of materials. Actions that may be considered abusive include careless or rough handling of brittle paper and fragile bindings, destructive photocopy practices, disfiguring manuscripts with notation or marks, and spilling coffee or ashes on materials. The list of abusive action is endless.

While much damage results from carelessness, abuse also includes such blatant actions as mutilation, vandalism and theft. Mismanagement falls more specifically within the realm of the librarian, archivist and institutional policies and programme that endanger library and archival materials. Through casual inattention, sloppy procedures, or outright sustained efforts to ignore the conservation needs of collections. Mismanagement relates to house keeping practices as well as processing, storage and handling procedures that adversely affect the well being of materials. Inappropriate conservation treatment carried out by unqualified personnel is also an example of mismanagement. Broader examples include institutions having neither security programme nor disaster preparedness plans. The lack of conservation programme that is a fully integrated aspect of archival administration contributes as much to the quiet disintegration of materials as the zealous application of inappropriate remedies.

CONCLUSION AND RECOMMENDATIONS

The longevity of information materials depends upon the quality of management, handling and the storage conditions. This calls for an integrated policy involving the creators, users and custodians. Preservation should be seen as a thread running through the total life of the record and a responsibility of all not only the conservator or the

archivist. If any organization will meet its objectives in the performance of its obligations it must take further steps to conserve and preserve information materials for posterity. Some feasible recommendations proffered by the researcher in the course of the study are outlined below:

- i There should be training programmes for information handlers/users such as librarians, archivist, and information technicians on preservation and conservation management. Such training programmes should include environmental control, storage, housing, and handling of information materials.
- ii An improvement in the storage environment should be paramount. This involves the storage of information materials in an environment in which the storage temperature and humidity levels are controlled. Air conditioning is perhaps the most efficient method of bringing about this. Also recommended is that there should be a fundamental review of the present staff structure in libraries and information centres. It is about time that positions of conservators exist. The following staff positions may be considered and adopted:
 - (a) Conservation Librarian
 - (b) Preservation Librarian
 - (c) Book Conservator
 - (d) Preservation Officer

The field of conservation and preservation has become so technical that whoever takes charge of these functions would need specialized training.

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Conservation and preservation publications. Canadian Conservation Institute (CCI) Notes. Storage of Metals – Canadian Conservation Institute (CCI) Notes 9/2. (PDF Version, 166 KB). Other safe materials include polyethylene or clear food-grade polystyrene boxes, and acid-free unbuffered papers. Avoid wood and wood-pulp products because they release sulphur compounds and organic acid vapours (acetic and formic acid). Also avoid oil-based and alkyd paints because they release volatile materials for long periods. London, UK: International Institute for Conservation of Historic and Artistic Works, 1982. Miles, C.E. "Wood Coatings for Display and Storage Cases." *Studies in Conservation* 31, 2 (1986), pp. 114–124. 6. Print Material Preservation and Conservation Techniques: In case of print material preservation, the following remedies can be taken-

a) Poor Qualities of Paper / Binding: Many reading materials that were published before 1950 were printed on very poor quality paper. Print materials in developing countries are often created using fragile, non-lasting paper product and ink. A page covering preservation and conservation at the National Diet Library. Contains information (manuals, records, etc.) relating to preservation and conservation work. As well as repair and measures to prevent deterioration and damage of collection items, the Library also conducts training programs and lectures. The NDL as the IFLA PAC Regional Centre for Asia will provide you basic information on preservation and conservation and practical suggestions for collection care through this site, based on the experience and knowledge which the NDL has gained by its activities.