On 18th- and 19th- Century Sacristy Furniture in the Maltese Islands: Preservation.

Michael, Formosa

Conservation Division, Heritage Malta, Malta
Institute of Conservation and Management of Cultural Heritage, University of Malta, Malta

Abstract

Very few studies have been devoted to Maltese sacristy furniture. Some sacristy furniture presents excellent examples of grand style artefacts and such important items ought to be preserved for future generations. Unfortunately, due to constant use, adverse environmental conditions, and in some cases neglect, sacristy furniture is continuously subject to irreversible damage. In this study, monitoring of relative humidity (RH), temperature (T) and light levels was carried out in two Maltese sacristies in order to investigate any adverse conditions that may be affecting sacristy furniture. A computer software routine was applied in order to predict the reaction of wood in two different pieces of furniture which, due to the type of construction, restrict expansion and contraction. Environmental monitoring results indicated that RH and T were in line with past records. In the two sacristies that were monitored, there was a relatively constant environment which fluctuated gradually throughout the seasons. The computer software predictions showed a low risk of physical damage, except in cases where the furniture was subjected to very humid environments. Under such conditions, the furniture was also prone to fast insect and mould activity development. Light measurement in both sacristies was above the safety levels recommended for highly sensitive materials and such materials, such as textiles, were being exposed to rapid deterioration conditions. The most damaging factors were found to be wear and tear, misuse and neglect. Old and recent restoration treatments had unfortunately not been carried out using sound ethical principles and historical information and materials were permanently lost.

1. INTRODUCTION

1.1. Aims of the study

The principal aim of this study is to find out the main agents of deterioration which are a continuous detriment to eighteenth- and nineteenth- century sacristy furniture on the Maltese Islands. Originally this study also incorporated the styles, materials and manufacturing techniques of such sacristy furniture. [1]

1.2. General remarks

This study is limited to the furniture inside the main hall of the sacristy, which is composed of a series of cupboards where each priest serving the parish has his own locked compartment. The cupboards serve as storage for liturgical vestments, sacred vessels and, where space is abundant, they also serve as storage for other religious items. Such cupboards are often equipped with large, wide drawers inside, specially designed to store unfolded vestments flat. Occasionally, where the room is large, one can find the central cupboard (locally known as the *bankun*) with shallow drawers at the top and further compartments below. The *bankun* is also used to lay flat vestments before liturgical functions.

Two sacristies, namely St Helen's Basilicain in Birkirkara and St John's Conventual church in Valletta, both dating back to the eighteenth century, were selected for the monitoring of RH, T and light intensity. In this exercise these two sacristies were intended to represent the other sacristies on the Islands. The two churches were chosen due to their odd features, particularly, the sacristy in St Helen's Basilica, Birkirkara which is located inland and its orientation is central, while the one in St John's Conventual Church, Valletta which is situated on a narrow promontory surrounded by sea. Apart from understanding the ambient conditions around the furniture the monitoring was also vital in investigating the possibility of insect and fungal activity in these two sacristies. Light levels were also recorded to find out any potential damage on other sensitive organic materials, such as textiles, in sacristies.

2. COMPARATIVE STUDY OF THE STATE OF PRESERVATION OF THE SACRISTIES

2.1. Condition of the masonry structure of the sacristies monitored

The sacristy's masonry construction of St Helen's is well maintained. The thick external wall, facing west, shows evidence of new pointing. [Fig.1] The three external windows, which are kept closed at all times, are recessed well into the wall and water penetration is very unlikely to take place. Any air exchange takes place through the different entrances to the room. Being at ground level, the room may suffer from rising damp.

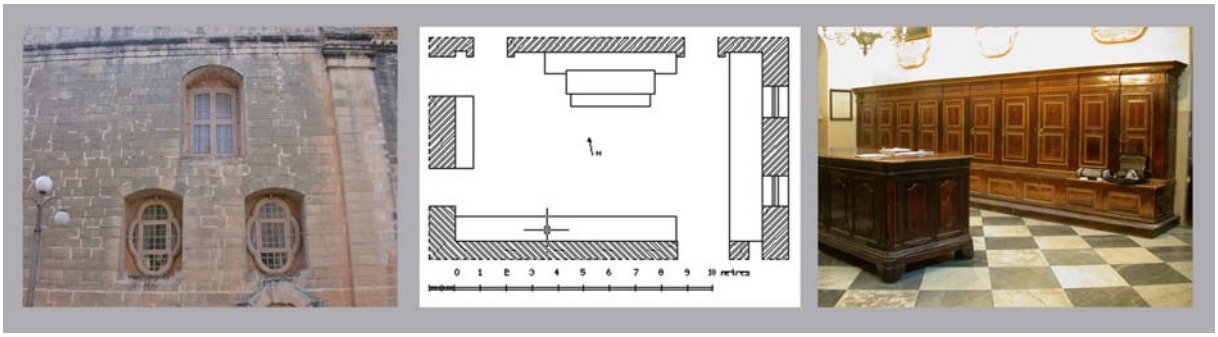

Figure 1: St Helen's Basilica, Birkirkara. Façade (left), plan (centre) and furniture (right) [2]

The masonry structure at St John's is also in good condition. [Fig.2] The external deep wall, facing south-west was recently restored and part of the external crust was replaced, perhaps due to excessive humidity problems. Below the sacristy are other rooms as well as a cafeteria. This helps to trap some of the humidity from the ground level from rising. There is also another room above the sacristy which protects it from undesired conditions. The four walls and the ceiling of the sacristy are literally covered by wood which is good buffering material. The trees on the outside environment protect the façade from the scorching summer sun thus limiting internal increase in T. Contrary to Birkirkara, the three windows are opened during warm days and it is expected that there is high air exchange due to the lost buffering capacity of the room.

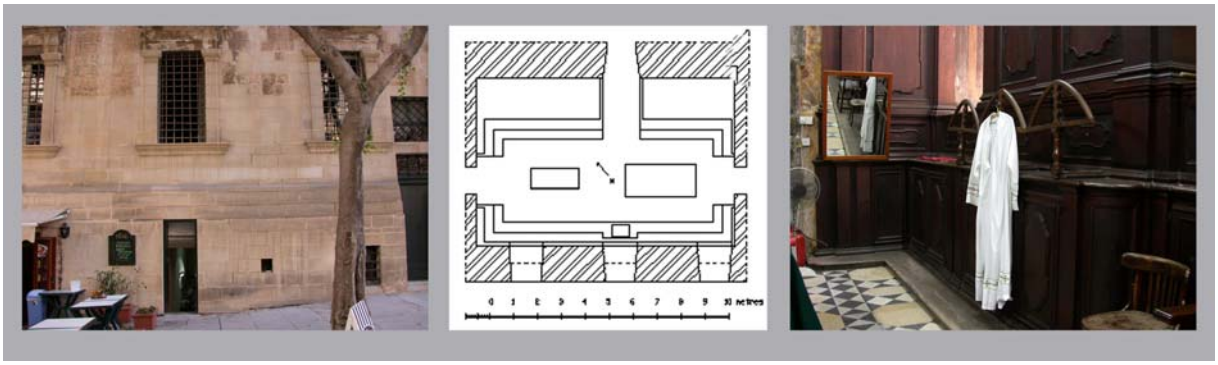

Figure 2: St John's Conventual Church, Valletta. Façade (left), plan (centre) and furniture (right) [3]

2.2. Climatic conditions

2.2.1. Monitoring of the sacristies

2.2.1.1 Monthly bi-hourly and mean daily relative humidity and temperature

In general the curves for both the internal RH and T were smoother than the external ones. [Fig.3] External fluctuations affected internal values almost immediately. The outdoor RH fluctuated greatly and rapidly. There were instances where the internal RH was higher than the external one.

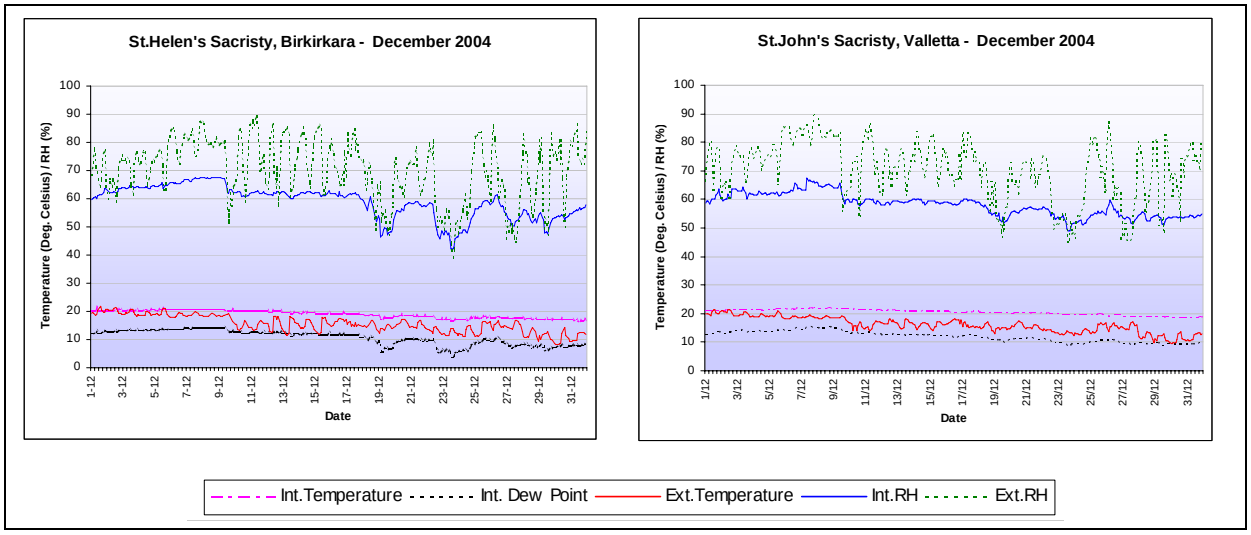

Figure 3: Bi-hourly RH and T for December 2004 [4]

2.2.1.2 Mean bi-hourly readings for each month

Both monitored locations indicated that there was a decrease in external RH when T increased, and vice versa. Internal values were constant throughout the whole day and this indicated that these values did not affect the interior much. [Fig.4]

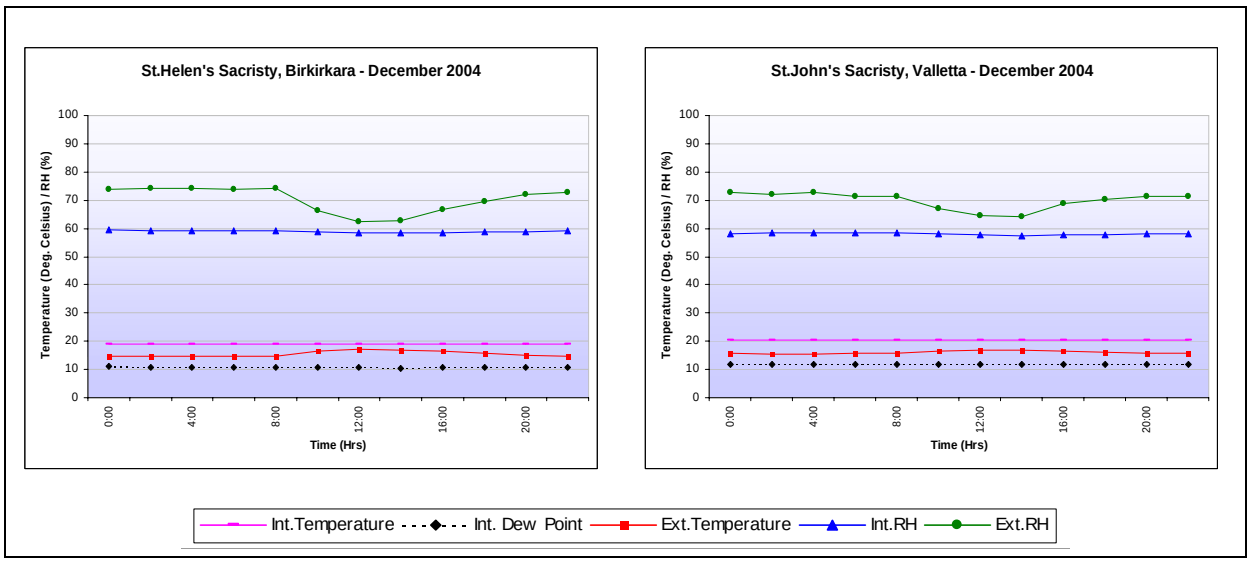

Figure 4: Mean bi-hourly RH and T for December 2004 [5]

2.2.1.3 Mean monthly RH and T

The two charts for Birkirkara and Valletta are almost identical. [Fig.5] The external RH is higher by an average of 11% throughout almost all the months taken under consideration. Meanwhile the mean monthly external T was almost in all cases lower than the internal one. Figure 6 shows historical records of RH (since 1951) and T (since 1922).

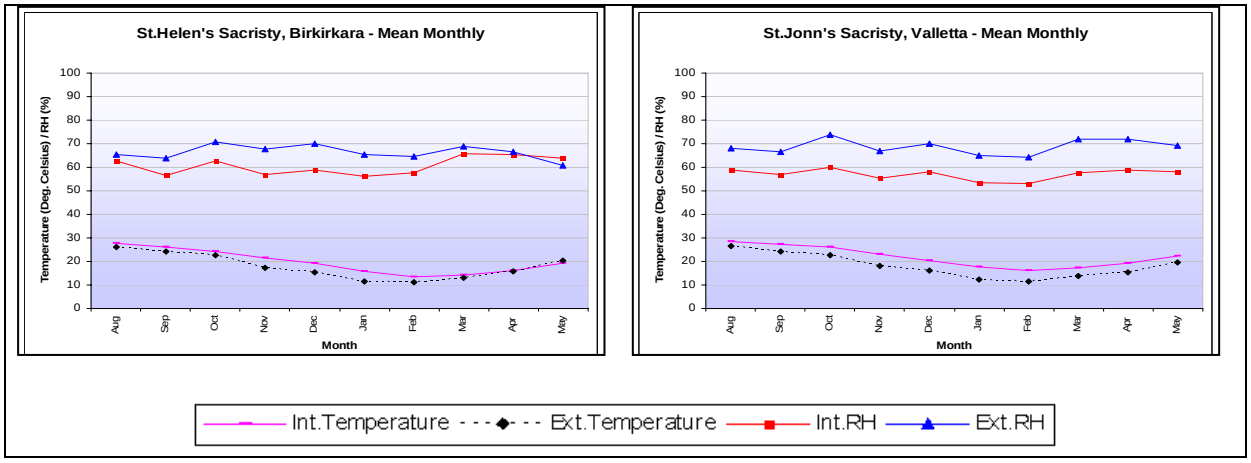

Figure: 5 Mean monthly RH and T [6]

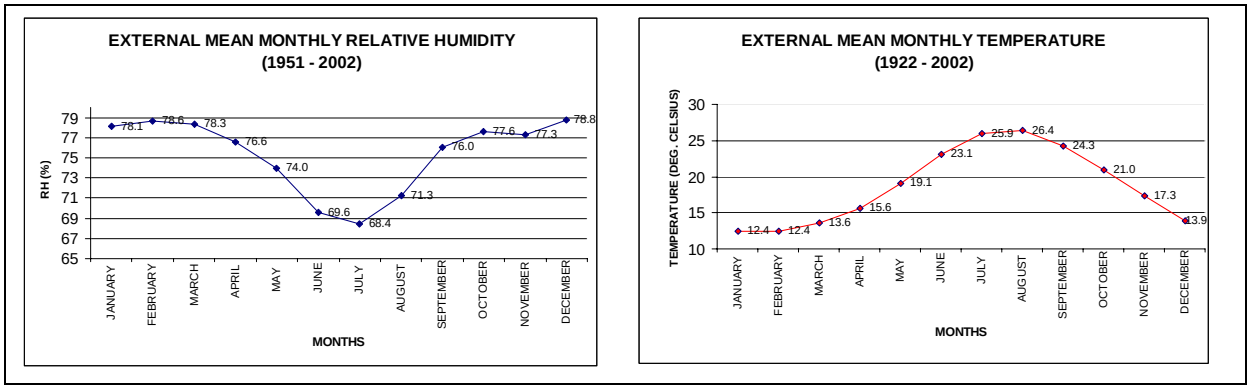

Figure 6: Historical records of external RH and T [7]

2.2.1.4 Mean monthly wood moisture content

In order to predict any physical and biological deterioration, it was a must to understand the approximate amount of water in wood expressed as a percentage. It is clear that St Helen's sacristy had slightly higher wood moisture content (MC) levels. [Fig.7]

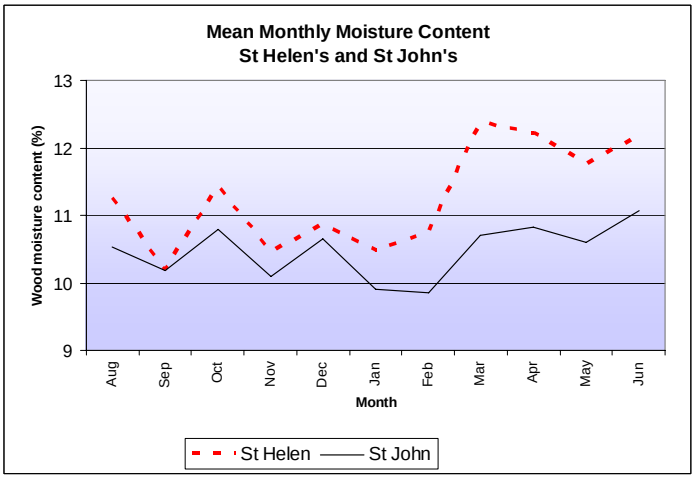

Figure 7: Mean monthly wood MC of the two sacristies monitored [8]

2.2.2. Analysis of the climatic data collected

The curves for both the internal RH and T were smoother than the external ones. The mean bi-hourly charts for the two sacristies monitored indicate that when the church is opened and closed or when visitors enter such rooms, the RH and T remain constant. In addition, the mean monthly RH was also lower than the external one except in Birkirkara for the month of May 2004. The above information automatically indicates the good quality of the buffering capacity of both sacristies monitored. It also

indicates that the wood MC remained quite stable and any changes are very gradual. Therefore the sacristy furniture is not subjected to rapid MC fluctuations, thus enhancing its state of preservation.

When comparing the external RH recorded between 2004/5 to past statistics it is clear that during the monitoring phase the external RH values were slightly lower than those expressed by the past statistics. Therefore it can be stated that the interior of the sacristy, during the monitoring phase, benefited from this decrease, also resulting in the lowering of the RH levels which induce lower wood MC levels.

2.3. Physical deterioration and computer predictions on the behaviour of wooden constructions

In each of the two sacristies one part of each furniture was studied. The parts chosen were restrained from expansion and contraction. In the case of St Helen's, a door from one of the benches was studied while in Valletta one of the lower doors was investigated. [9] A computer procedure was designed and used to predict expansion, contraction and warping of unrestricted wood.

St Helen's Basilica , Birkirkara

This construction is evident in most sacristy benches on the Maltese Islands. [Fig.8] There are two braces nailed across the door which may restrict lateral movement. To some extent, the same can occur in the region of the metal fitting at the centre. The predictions resulted in an expansion/contraction of about 0.52% tangentially and 0.25% radially. These values are very close to the recommended elastic limit of 0.5-1%. [10]

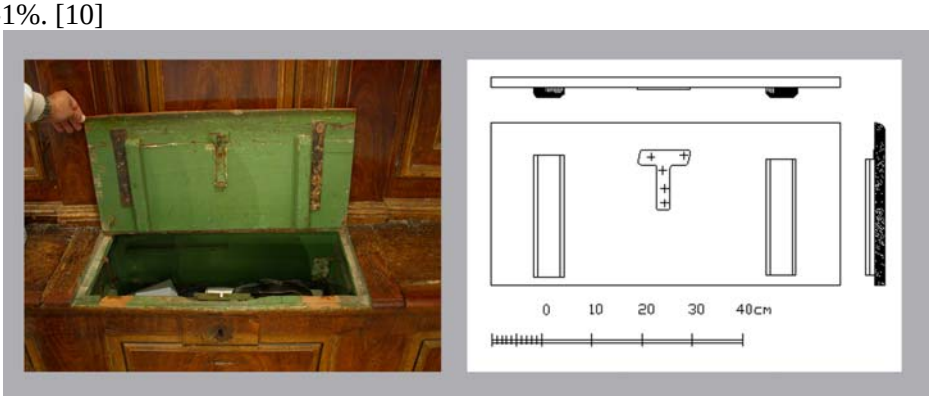

Figure 8: Door and its orthographic views [11]

St John's Conventual Church, Valletta

The door construction was present in a number of other sacristies. [Fig.9] Since similar type of wood and ambient conditions were found in the sacristies of St Helen's and St John's, little change will be induced under the present ambient changes.

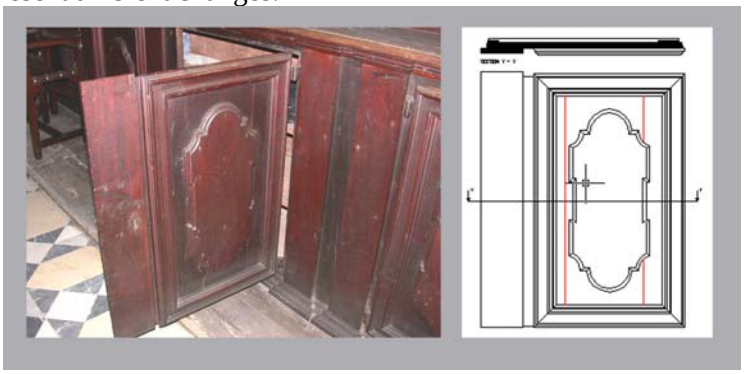

Figure 9: Door and its orthographic views [12]

2.4. Biological deterioration

2.4.1. Deterioration by insects

The development of insect larvae depends mainly on the nutritional content of the wood, its MC and T. [13] *Anobium punctatum*, furniture beetle, is most probably the most common type of beetle which attacks seasoned wood in Malta. The optimum T for this beetle is 22 to 23ºC and the most favourable

MC is about 25%. Below 10-12ºC wood MC the *Anobium punctatum* larvae stop developing, yet, other types of insect larvae may still be active. The larvae can survive for long periods of dryness and recover quickly when the ideal conditions take place. [14] Mean monthly T and wood MC predict the rate of development of *Anobium punctatum* larvae. [Fig.10]

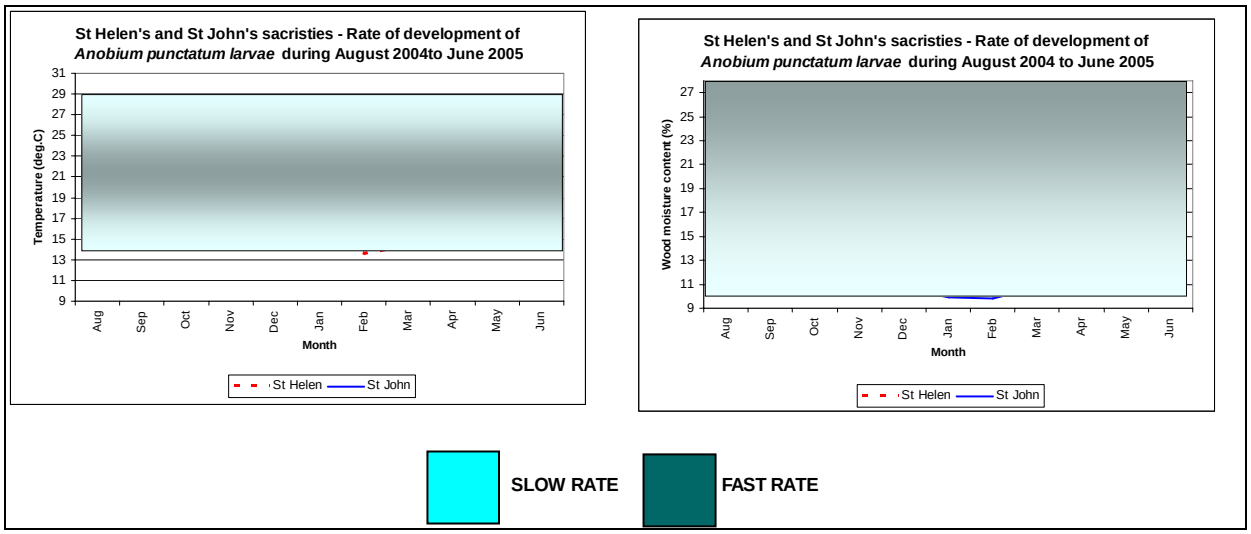

Figure 10: Variations in ambient T and wood MC that predict the rate of development of *Anobium punctatum* larvae –August 2004 to June 2005 [15]

Throughout the whole eleven monitoring months, the levels of T were inside the development levels, yet, the optimum T levels were reached during the months of October 2004 to January 2005 and April to June 2005. In both sacristies the wood MC level was very low throughout all the months, but in parts that are in contact with the high humidity areas, such as the legs, platforms and backs, one will notice greater MC levels and insect activity is likely to take place.

2.4.2. Deterioration by fungi

The mean monthly RH and T indicate that both St Helen's and St John's sacristies are not in imminent danger of mould activity. Figure 11 represents the mean monthly RH and T of St Helen's Basilica. It is indicated that parts of furniture with high MC levels are prone to have evident growth after 10 days in the months of January and February, yet during the month of August it will become noticeable only after about 100 days.

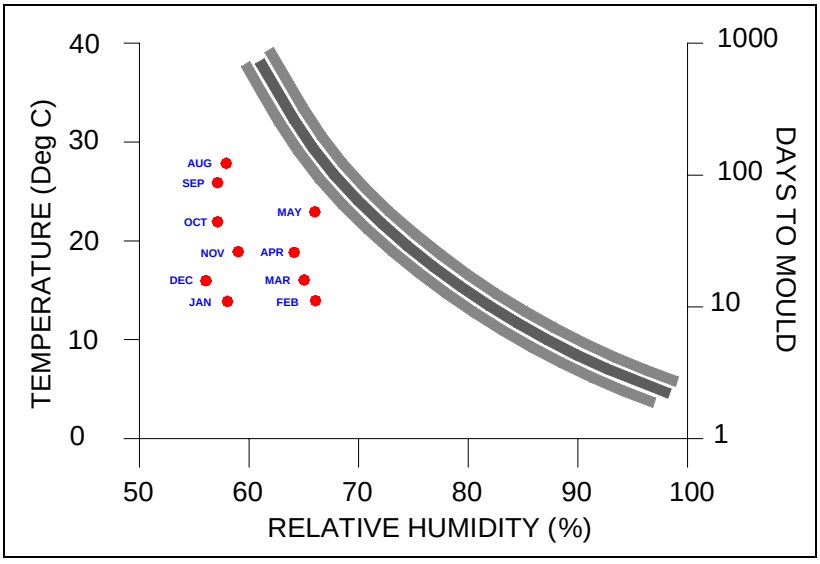

Figure 11: Possibility of mould growth on a nutritious substrate as a function of temperature and relative humidity – St Helen's Basilica, Birkirkara [16]

2.5. Light conditions

Data loggers were set to take light measurements every 10 minutes for a period of 7 days. Table 1 shows the mean daily results and approximations for a whole year. Light levels in both sacristies were above recommendations. Achieving the light exposure will not stop light deterioration but will slow down deterioration by light.

Table 1: Light exposure results and recommendations [17]

	Birkirkara	**Valletta**
Mean daily lux accumulation recorded	1152.0	289.6
Annual lux accumulation (calculated)	420291.0	105704.2
Daily light exposure limits highly sensitive 137 LH sensitive 493 LH moderately sensitive 2000 LH		
Annual Light exposure limits highly sensitive 5000 LH sensitive 180000 LH moderately sensitive 730000 LH		
LH = Lux Hours		

2.6. Anthropogenic deterioration

A moderate level of deterioration has been the result of neglect and misuse. In cases where *Picea sp*. (spruce) was used, such as the platforms, the surface damage is more pronounced. Some sacristies show unnecessary scratches and dents as a result of careless storage of objects on and next to the furniture. Most original locks are not functional anymore, perhaps due to keys being misplaced. A considerable number of original locks have been purposely replaced with new cylindrical locks. The latter replacements caused further interventions in order to fill in any previous holes and re-drilling new holes in other locations. A particular sacristy was unwisely equipped with hasp and staples and padlocks. Some cupboards are carelessly stored with junk such as old electrical wires, used candles and other loose items. Such occasions dishonour the original function of the sacristy. On a number of locations, doors were left unlocked and unattended and at times also left half closed or without any hinges at all. The interior of cupboards was in some cases painted over and occasionally exterior surfaces were smudged.

In most cases, wear and tear is the cause of deterioration. Some nailed hinges became loose due to extensive door widths. Usually it is the upper hinge which is pulled out inducing doors to droop. In most of the sacristies visited, scratch marks are below key holes as a result of other keyed rings rubbing against the surface during opening and closing operations. Some decorative elements, such as mouldings and carved items, were lost or broken during cleaning procedures. In some cases cupboards were excessively loaded with weighty objects therefore causing the whole furniture to sag. Platforms were inevitably worn out. There were some locations where there was an attempt to protect platforms by placing sacrificial sheets on top. Some sacristies show little signs of wear and tear due to recent restoration treatments and in such cases historical value, was permanently removed. The surfaces of some sacristies were protected by fixing plastic laminates.

3. CONCLUSION

The mean monthly T and, to some extent, the RH values for the nine months during which the study was carried out are in line with the data of the past 83 years and are within the standard deviation. The monitoring should have been carried out for a full year even though the climate inside both sacristies was found to be quite constant and any registered seasonal changes were gradual. This indicates a

stable environment of the sacristy cupboards. The recorded ambient conditions indicate a low risk of damage in constructions restricted to expansion and contraction. Moreover, the computer software routine predictions indicated also that there should be no alarms unless the furniture is in a very humid environment. These predictions were based on unrestricted wood with homogeneous properties which, in reality, is only a theoretical situation, and therefore such results should only be considered as indicative.

The most significant agents of deterioration, which greatly altered the state of preservation of the sacristy furniture, should be identified as wear and tear, misuse and neglect. Most preceding restoration treatments have been a threat due to lost historical information, techniques and materials. There were cases where the original surface coatings have been literally stripped off, while the practice of replacing original locks should also stop immediately. In the future, interventions should only be carried out by, or under the supervision of, professional conservators who should abide by the rules and ethics of conservation practice.

By providing adequate ventilation and detaching the furniture from the wall, excessive levels of wood MC will be lowered. This might not be possible in the case of wall-to-wall furniture; in such cases, there should be regular and continuous inspection by a conservation scientist to keep any deterioration under control. Light levels should always be maintained to a minimum.

More relative humidity, temperature and light monitoring studies should be carried out in other churches to assess both the furniture and the other works of art. Wear and tear is inevitable, yet, it should be kept to the minimum levels possible. Sacristans must be further educated on how to maintain the daily function of the sacristy while preserving its state of conservation. Sacristies should only remain functional if, and only if, the proper protective procedures are followed.

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