Holkham Estate Returns to Traditional Materials and Craftsmanship

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Abstract

This paper outlines the quantum of maintenance work that the Holkham Estate is responsible for, concentrating on the annual repainting programme and incumbent joinery repairs. The resultant dissatisfaction with various modern paints led to the search for more effective and sustainable paint systems. Our discovery of the Allbäck linseed-oil paint, products, and working system (Windowcraft) led us to change our approach to window repairs and painting.

Ultimately we were so pleased with the products and finished results that we ended up importing the paints from Sweden and making them available to a British audience through the formation of Holkham Linseed Paints. This, in itself, concurred with our wish to continue the diversification of the largely agricultural estate and, importantly it concurred with our mission statement: 'The Holkham Estate will work to ensure that the Hall and wider estate are managed and enhanced to the highest standards so that we are one of the very best, to be enjoyed by future generations.'

Introduction

The Holkham Estate in north Norfolk is, as you would imagine, a traditional landed country estate, where income has in the past been derived from agriculture. It obviously has incumbent properties too, and these range from the main Grade I listed Hall, through to farmhouses, smaller cottages, and farm buildings, both new and old, and some redundant (Figure 1). The housing stock is generally of the eighteenth and nineteenth centuries, although, as the estate diversifies into activities like tourism and property development, it has acquired and built new properties over the past century. In all there are over 300 houses and about 50 farm steadings and barns.

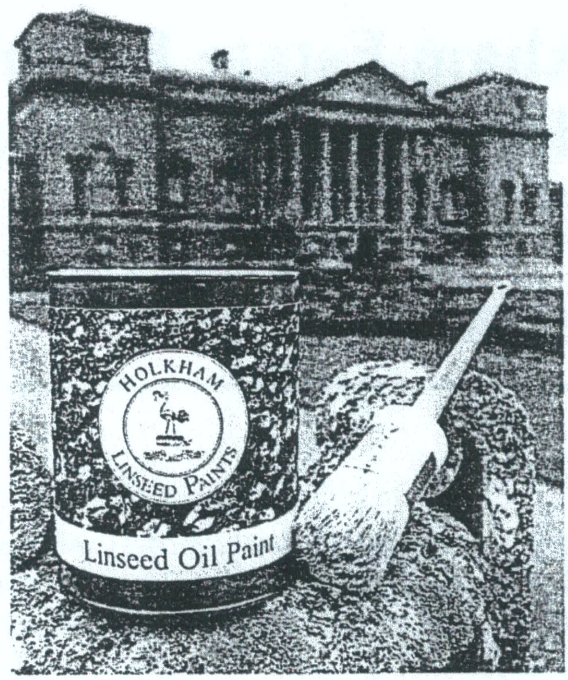

Figure 1 *Paint in the context of Holkham Hall.*

The sheer quantum of buildings demands a rigorous maintenance programme, which is carried out by a staff of fifteen in the Building Maintenance Department, as well as some specially chosen contractors. An example of the magnitude of the task in hand is the painting programme. For the past few decades we have repainted exterior joinery on our houses on a six-year cycle – 300 houses divided by six years amounts to 50 houses per year. This has generally cost between £75,000 and £100,000 per annum: quite a drain on finances.

Some might say that six years is too long an interval to leave between window repaintings using modern-day oil-based alkyd paints. This is particularly so on southern elevations, where the sun is brightest (and therefore the extremes of temperature greater), for after about three or four years cracks start to appear in the paint. These allow water ingress, which is exacerbated, even on a hot, sunny day when other water would have evaporated, by the water resting hidden under the paint to continue its rotting process. This has meant that in year six we are not only having to repaint the windows, but also effect some costly joinery repairs (Figure 2). Much of this repair work is made on windows that have already been repaired during the past 50 years, when poor-quality, fast-grown softwood with a low proportion of good heartwood was the only wood available.

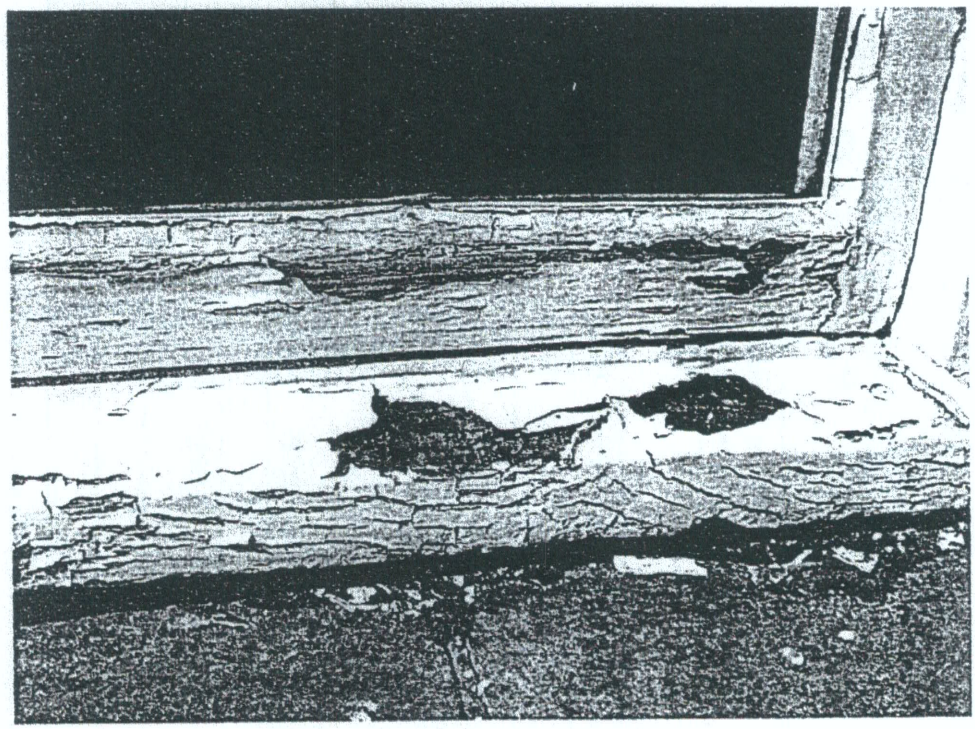

Figure 2 Detail of conventional alkyd paint on a Holkham estate cottage six years after it was painted, showing paint cracking, flaking, and allowing water ingress leading to timber decay. Note that the paint has also flaked off the putty, which itself has hardened and cracked, requiring replacement.

The Windowcraft system

The answer rested with finding a paint system that accommodated a greater interval between applications. I was lucky in that Norfolk County Council's Building Conservation Team, led by the irrepressible Michael Knights, organized a day-long seminar at which Hans and Sonja Allbäck spoke about Windowcraft, linseed oil, and linseed-oil paints, and the benefits they lend to wood, as well as the importance of selecting quality slow-grown, air-dried (if possible) softwood for exterior joinery.

If, on the Holkham Estate, we can move from a six-year painting cycle to one of fourteen years (with a coat of warm, raw linseed oil on the windows after seven years), then the cost savings are going to be huge. We have calculated that we will make a saving by Year 18, but from then the savings will grow exponentially (Table 1).

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	Conventional Alkyd Paints			Holkham Linseed Paints Windowcraft method x)			
	£	Annual cost £	Cumulative cost £		£	Annual cost £	Cumulative cost £
Year 1	500 Repairs 1,200 Painting 1,700	1,700	1,700	Wood repairs and scraping back Linseeding and painting	6,000 1,500 7,500	7,500	7,500
Year 6	1,700.00 ×6 years inflation @ 5%	2,278	3,978				
Year 7				1 coat warm linseed oil	£300	300	7,800
Year 12	2,278 ×6 years inflation @ 5%	3,053	7,031				
Year 14				1 coat linseed paint £400 @ 14 yrs inflation PC sum for any repairs £600	792 600	1,392	9,192
Year 18	3,053 ×6 years inflation @ 5%	4,091	11,122				
Year 21				1 coat warm linseed oil £300 @ 14 yrs inflation	594	594	9,786
Year 24	4,091 ×6 years inflation @ 5%	5,483	16,605				
			£16,605				£9,786

NOTES 1 We are confident that the prime cost sums inserted for window repairs in the 14th year should not be necessary because of the quality of the paint and oil protection, but have included it for a fair comparison.
2 We have assumed (using our own estate experience) that every six years, when a window is painted using conventional painting systems, it will require extensive preparation, rubbing down, and, in many areas, three coats of paint.

Table 1 *Price comparison between conventional (alkyd) and Holkham Linseed Paint using the Windowcraft method of renovation on a three-bedroom semi-detached Holkham estate cottage.*

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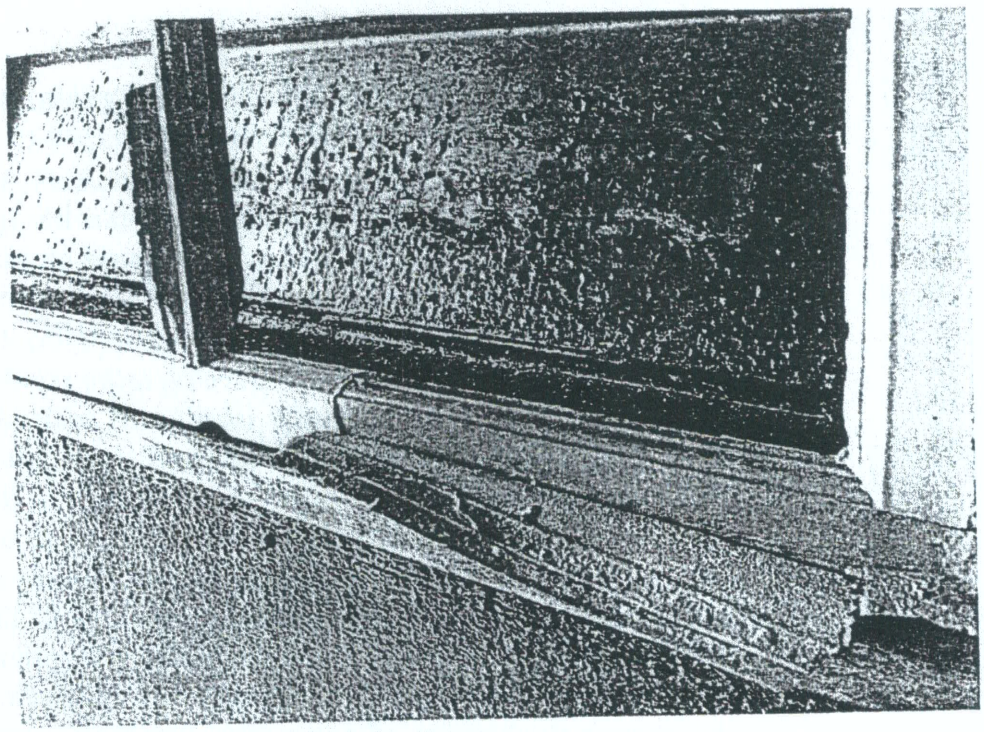

Figure 3 Modern layers of alkyd oil-based paint peeling off a casement window having been dipped in our hot-linseed-oil dipping tank for approximately three minutes. The wood is impregnated with linseed oil at the same time.

It is, however, true that the Allbäck Windowcraft method does take longer and costs a little over four times as much as using an alkyd paint system;[1,2] longer because we are taking quite a high percentage of sash and casement windows back to the workshop for repair (Table 1). We remove the old layers of paint (analysis for the Hall has revealed that the first coat was a grey oil paint, very similar to the 'Sea Mist' Holkham paint we are now applying), take out the original glass using a putty lamp (and find that most of the putties have cracked and need replacing anyway), make repairs, impregnate with linseed oil, re-glaze, and paint with Holkham Linseed Paint (Figure 3). The aim is therefore to repaint, using this method, 20 houses a year until all have been done; this will take 15 to 20 years. The full financial benefit will therefore not manifest itself for over 30 years. The Holkham Estate has, however, been around for nearly 400 years and every decision we make is made with a long-term view in mind.

Why linseed-oil paint?

Personally, I do not think we have another option, save replacing our windows with PVCu units, and that, I am happy to report, is not an option from aesthetic or environmental standpoints. Furthermore, I believe that the use of alkyd paints over 50 years has sped up the degradation of our windows and we are now forced to make more drastic repairs. In fact it should be noted that our comparison (see Table 1) is not really a fair comparison because in employing the Windowcraft method of renovation we are undertaking more repairs than if we carried them out *in situ*, where easier (short-cut) options might be to use fillers, epoxy resin, or putty and then 'gloss' over them. We also repair and paint the inside of the windows, which adds to the cost.

I suppose it is possible that we could continue to use modern alkyd oil-based paints, moving to a shorter repainting cycle of, say, four years and repainting before cracks appear in the paint. That would mean even greater expense and would not necessarily obviate the need for some joinery repairs; indeed, adjustments would be needed to allow for the greater thicknesses of paint that eventually stop windows from shutting properly. The most expensive part of any painting is invariably the labour content. I suspect we all know in which direction labour costs will continue to go. The actual proportion of the cost of the paint when attending to exterior joinery on a typical estate cottage is only 8 per cent. Even if our paint is double the cost of modern paints, when viewed in the context of the total cost of the job this is hardly perceptible, and is therefore an even more compelling argument to use the right paint from the beginning.

My interest in Holkham Linseed Paints is threefold. Primarily, as outlined above, I am attracted by the cost benefits of using such a long-lasting paint. Secondly, I prefer to use it, as it is a product that is manifestly more environmentally friendly than the oil-based alkyd and water-based paints on the market, as well as being much safer for painters to use, having an extremely low VOC (volatile organic compound) content. (It also has the most exquisite smell – reminiscent of cricket bats on lazy summer afternoons!) It is also sustainable, being made from linseed/flax that is a renewable resource, as opposed to finite mineral oils. Finally, I hope that it might help to stem the tide of PVCu replacement windows that seem to be destroying the character of much of our built heritage.

Traditionally, and probably up to the Second World War, lead paints were the preferred choice for exterior joinery. These days they can only be used on certain listed buildings under strict licensing procedures.[3] Over 80 per cent of our buildings at Holkham would not qualify. Additionally there are, of course, the deleterious health and safety issues associated with lead paint. What many people do not realize is that the binder in traditional lead paints was linseed oil and that the efficacy of these paints was derived not only from the anti-fungicidal properties of the lead oxide, but also from the natural qualities of the linseed oil. The Allbäck/Holkham linseed paint is a similar traditional formula except that lead oxide has been substituted with zinc oxide and titanium dioxide.

The importance of good Scandinavian pine

Turning now to timber. If one thinks about it, the wood in original Georgian and Victorian windows, very often pine, has been around for 150 to 250 years. It has therefore been dead for a little longer and has over that period gradually dried out. The addition of linseed oil to that wood provides much needed nourishment. Indeed there are 1,000-year-old original softwood pine doors and porches in Scandinavian churches still in good condition, thanks to regular applications of linseed oil. Linseed oil is an important, but not the most important, factor controlling the longevity of wood. The quality of the wood itself is paramount (Figure 4). Wood sourced from slow- grown older trees has a much higher proportion of heartwood in it than sapwood. It was this timber that was traditionally imported from Scandinavia. Sadly the quality of wood imported to Britain since the 1950s has declined markedly. It is quick-grown and therefore has a much higher sapwood content, which is less durable and more prone to decay. It is more often than not harvested all year round; furthermore this wood is artificially kiln-dried to remove the moisture.

Thanks to the Allbäcks, we now import timber from a traditional Scandinavian sawmill that only uses trees that are 100 to 150 years old, that have been felled during the winter (when the sap is down), and that are then left to air-dry 'in stick' in covered warehouses for two years. The pine is denser; it has a higher content of pinosylvin, a natural insecticide; and it is more resinous – a factor our joiners do not necessarily like, as they have to clean their tools more regularly, but a small price to pay (Figure 5).

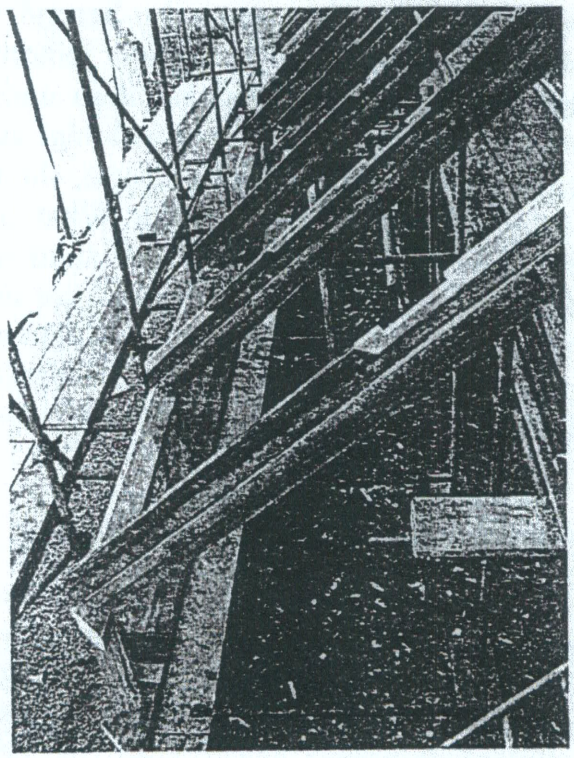

Figure 4 The rafters of the Fig House in the Holkham kitchen gardens. The 1872 timbers have benefited from the application of warm raw linseed oil. Note the lightness of the as-yet-untreated timbers and the relative lack of new wood required in these repairs, undertaken during 2001.

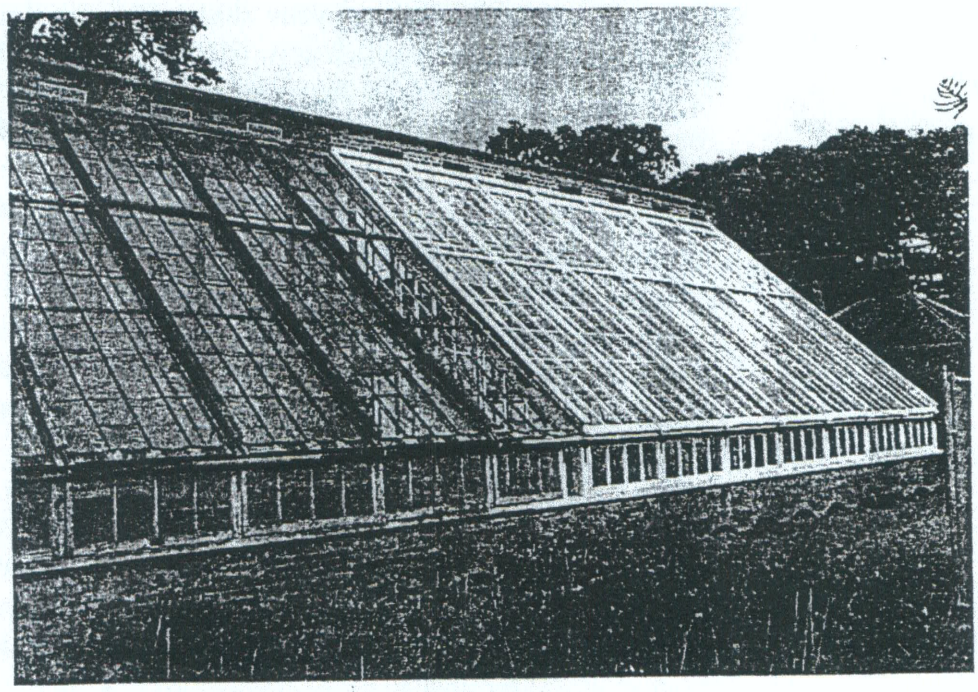

Figure 5 The Fig House on the right, alongside the Peach House, now restored with the help of English Heritage grant aid.

I am convinced that this Scandinavian wood is similar to that used on the estate in the nineteenth and early twentieth centuries. We find that many of the repairs being undertaken are on joinery repairs made in the last 50 years. We are, however, also finding that original windows are beginning to fail due to fifty years' use of alkyd paints that have, through water ingress through cracks, sped up the decay process. We know, through talking to retired employees and through evidence found in our old paint shop, that linseed paints were used extensively on the estate before the Second World War.

Our Scandinavian pine is being used to repair existing windows, doors, and bargeboards; but we are also using it in the construction of all new windows, whether that be for new properties being built on the estate or for replacement windows where it is more cost effective to make new, rather than repair those that are old and in poor condition.

Joinery repairs and decoration

When we have new windows to paint, it is an obvious choice to use our linseed oil and Holkham Linseed Paint, since there is no expensive removal of old paints to weigh up. We use the paint on new-build properties that we are selling speculatively, as we are happy with it, we like to practise what we preach, and it does not have a bright gloss finish.

Existing windows are repaired in the workshop by being stripped of paint layers using a combination of scrapers, hot-air guns, and hot linseed oil, and sometimes using our own hot-oil dipping tank that can remove paint in minutes. This is, however, used more for impregnating joinery with linseed oil (see Figure 3). Old hardened putties are removed using the Allbäck patented putty lamp, which uses infrared radiation to soften the putty without damaging historic glass.

Repairs are made, and any remaining imperfections in the wood are filled using either linseed putty or 'Luslack', a traditional filler derived from chalk dust that can be mixed to the consistency of anything ranging from filler to milk. This is applied to the wood, allowed to dry, and sanded down so an old but repaired window has a smooth surface and when painted looks as good as new.

Three coats of linseed-oil paint are applied, with at least 24 hours between each coat so that the paint has time to dry before the next application. This is a factor that some painters dislike as they are used to proprietary paints drying much more quickly and thereby allowing

another coat to be applied in the same day. As far as we are concerned, this simply means that work has to be better organized. Painting needs to be done during warm weather from April through to October, or in the artificially warm environment of a heated workshop. We found to our cost that when we painted outside during freezing weather and snow in February, the paint took seven days to dry, and then did not dry properly. In truth the paint actually takes a couple of years to dry fully and this factor alone adds to its longevity.

As soon as the paint is applied it begins to oxidize in its environment. This oxidation process continues throughout the life of the paint and accounts for the gradual ageing process whereby after a few years the paint begins to fade. After six to eight years it is advisable to apply a coat of warm (finger hot, say 60°C) raw linseed oil or Holkham Maintenance Oil (a higher-quality linseed oil) to the paint. This miraculously brings back lustre to the paint and the original colour is restored. After a further six to eight years the same fading is again evident, but this time should be dealt with with a light brushing down and cleaning of the surface, and then a single coat of the original linseed-oil paint. Because the paint oxidizes, excessive layers of paint do not build up and the window still functions. If the coat of linseed/maintenance oil was not applied after six to eight years, the paint would go chalky and even dusty – a further sign that repainting needs to take place. Pigment comes off if a wet thumb is rubbed down the painted surface.

I have seen buildings in Sweden that Hans Allbäck painted 15 years ago and which have received no attention since. The paint is faded and chalky, but importantly there is still 100 per cent coverage of the wood, and therefore protection. There is no evidence of wood decay at all. Window frames and jambs are worked on *in situ* when weather conditions allow.

We are also experimenting with applying Holkham Linseed Paints directly on top of existing alkyd paints and will be monitoring their efficiency, since if successful it will allow us to achieve our stated aims ahead of time and indeed remove one large obstacle to sales of the paint to a wider audience. People are often frightened away from using our paints by the perceived high initial cost of scraping off existing modern paint that, in many cases, is often covering a multitude of sins.

Holkham Linseed Paints

Having used linseed-oil paint for a couple of years and having seen the satisfaction of our craftsmen, we decided that the next step (as part of our estate's diversification away from relying solely on agriculture) would be to import the paint into Britain and make it available to a wider audience. It was plain to see that there were very few suitable, traditional, or effective paints on the market. In the spring of 2002 we signed an agreement with Hans and Sonja Allbäck to distribute their paints in the United Kingdom. Whilst working on the business plan, I tried to get a grasp of how much paint we might sell so I asked Hans how his sales had gone in Scandinavia and Germany. He answered that they had doubled year on year for the previous four years. He has been selling paint for much longer so I can only presume he has many satisfied customers placing repeat orders. Next year we plan to start the importation of Malin Allbäck's emulsion paints that we ourselves are experimenting with at the moment.

The ultimate dream, if sales increased to such an extent, would be to manufacture the paints under license here in Norfolk (which, incidentally, was traditionally a good flax-growing area and is placed on a similar latitude to southern Sweden). Certainly the initial growing of linseed on our own land is possible – we last did it five years ago and the pressing of seeds to make oil is a relatively simple process. There are so many more applications for linseed oil, other than as a primer prior to the use of linseed-oil paint. All our farm barn doors, gates, and fence posts are now programmed to be nourished with it.

Conclusion

It is a massive responsibility to keep all our buildings in good order for the future. But just as we are phasing out the use of damaging cement in favour of more sympathetic lime mortars, so we are doing the same with traditional linseed paints in place of modern, less effective alkyd- and water-based paints. We believe wholeheartedly that we are making the right decisions and I am glad to see that a number of other estates all over the country, with similar outlooks, are following our lead, as too are an increasing number of designers and specifiers.[4]

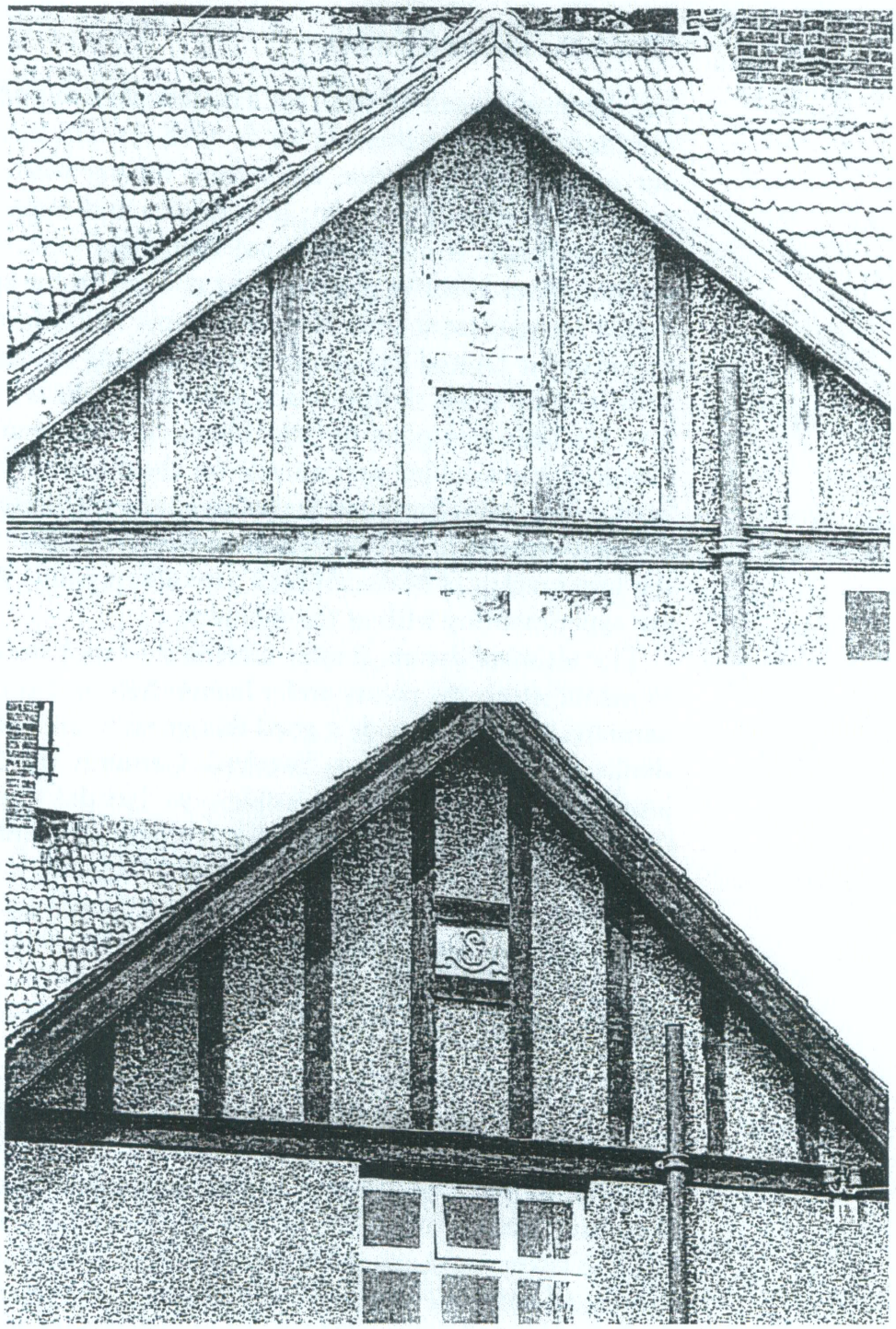

Figure 6 The oak timbers on these buildings show the rejuvenating effect (before and after) that a coat of warmed, raw linseed oil can have.