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Asbestos-Handled Finishing Tools: History, Risks, and Mitigation

INTRODUCTION

There is very little information online and in print about asbestos handles on finishing tools beyond passing mentions such as the pithy "asbestos handles are also found" from Fahey's 1951 *Finishing in Hand Bookbinding.* A survey created to inform this article asked bookbinders and book conservators about their level of awareness of asbestos in this context and saw that as the number of replies slowly climbed to 73, the proportion of finishing tool users reporting awareness of asbestos handles remained consistently at approximately 50%, with, as of the time of writing, 64% saying they would not feel confident identifying such a handle on their own. Those who knew about asbestos handles reported finding them in the United Kingdom (UK), United States (US), and Canada only.

This article is therefore aimed to fill a gap in knowledge and provide as much information as possible about the history and risks of these handles, as well as options once asbestos is suspected or identified. The history is pieced from printed mentions, material evidence, business records, and bookbinders who worked from the 1950s onward or their families. To understand risk and guidance on mitigation, I have interrogated the British and American regulations and (British) Health and Safety Executive (HSE) advice, and spoken to licensed asbestos contractors, asbestos testers and trainers, lawyers, expert witnesses in asbestos cases, insurance brokers, hazardous waste disposal contractors, and my local authority in London. In most cases, this was a use of asbestos for which the various experts were previously unaware, with the exception of one licensed contractor specializing in cultural heritage. Almost all of the guidance from the HSE, for instance, is more relevant to building contexts and somewhat open to interpretation or data that is hard to obtain.

The reader should note that this article is an attempt to summarize available information to raise awareness, but it is not legal or medical advice in any way. Anyone dealing with these tools should do their own research and think about compliance with the law, compliance with insurance policies, acceptance of risk, and ethics; it might be that what is technically legal is still more risk than an institution or individual is willing to (or should) assume. The focus, where there is regionally specific data or policy reflected, is on the UK, but I have also tried to point to American and Canadian policy where possible.

Independent submissions

ASBESTOS

Asbestos is a broad term that refers to a family of six naturally occurring carcinogenic minerals with similar properties: chrysotile, which is a serpentine mineral, and the five amphibole minerals actinolite, amosite, anthophyllite, crocidolite, and tremolite. Nicknames may be used colloquially: white asbestos refers to chrysotile, brown asbestos to amosite, and blue asbestos to crocidolite. Properties such as fiber length and thickness vary somewhat between them, with the result that chrysotile is generally considered to be less hazardous than the amphibole asbestos types, although the degree to which that is true is controversial. Different types of asbestos may contaminate each other in the ground, so it can also be difficult to know exactly what is present when hazards are assessed (IARC Working Group 2012a).

These fibrous silicates are found globally and have been used in small quantities at least as far back as ancient Greece. In the late 19th century, the discovery of particularly large deposits in the US and Canada came just in time to meet the massive demands of the Industrial Revolution. At the time, asbestos would have appeared as a miraculous material. It is lightweight and inexpensive, and resistant to heat, water, acid, and biological degradation. It worked also as acoustic and thermal insulation and was particularly useful near electronics, as it is nonconducting. Its fibrous nature meant that it could be woven into textiles, and it combined well with other materials to make a wide range of products: virtually anything one can imagine where these properties could be useful.

Impact of Asbestos on Health

While earlier deaths had been linked to asbestos exposure, the first one to get public attention was in 1924, of a 33-year-old

woman in England who had worked in a factory for the previous seven years spinning asbestos into yarn. The discovery of this new illness, named *asbestosis*, spurned a government-commissioned study in 1930 finding that after working in the asbestos industry for at least five years, a third had asbestosis, and 80% developed it after 20 years: subsequent studies found that it had a strong correlation with high occupational exposure (UK Health Security Agency 2024). Regulations to control asbestos exposure were first introduced to the UK in 1931, including provisions for medical surveillance and compensation for illness. The first regulations in the US were not introduced until the 1970s.

While asbestos use continued to rise, researchers found more and more links to health problems. A connection to lung cancer was first made in 1935 (Bartrip 2004); by 1955, it was also understood that smoking increased the risk 10-fold of developing lung cancer among those exposed to asbestos (IARC Working Group 2012a). In 1960, a link was made to a newly recognized illness—mesothelioma: a rare cancer of the pleura (a membrane that surrounds the lungs), peritoneum (a membrane that surrounds the abdominal organs), or pericardium (a membrane that surrounds the heart) (Bartrip 2004). Mesothelioma has remained almost entirely connected only to asbestos exposure. Other cancers (of the pharynx, larynx, esophagus, stomach, colorectum, and ovary) have also been investigated for links to asbestos, but as most of the research has focused on the preceding three conditions, the evidence is not yet conclusive (IARC Working Group 2012).

Generally, asbestos-related conditions are related to the inhalation of asbestos fibers. Individual asbestos fibers range from 3 to 10 μm, not possible to see with the naked eye, and light enough to remain airborne for a substantial time, so even in situations where asbestos seems contained, there may well be dangerous levels of contamination. Fibers, especially if short, may be cleared by mucus in the upper respiratory tract, but if they are carried into the alveoli, they tend to be retained longer. Macrophages (a type of white blood cell) will try to engulf and break down the fibers, but the longer fibers associated with amphibole asbestos cannot be adequately cleared this way. Repeated failed attempts by macrophages to engulf long fibers lead to inflammation and eventually the health problems discussed here. It is also possible for asbestos to enter the skin, but it stays localized to the contact area, forming benign calluses or corns (UK Health Security Agency 2024).

Asbestosis, mesothelioma, and lung cancer are the three main diseases strongly correlated with asbestos exposure. Other cancers have weaker or less studied connections: cancer of the larynx, pharynx, trachea, sinus, esophagus, stomach, colon, and rectum (Kieffer 2006). Asbestos-related conditions are particularly understudied in women: fewer women worked in the asbestos industry historically and therefore formed a harder population to study. There may be links with ovarian cancer, for instance (Slomovitz et al. 2021).

Modes of Exposure

There are several modes of asbestos exposure, classified as occupational, secondary, and environmental. Occupational exposure occurs at work—classically in the 20th century among workers in asbestos factories but now more frequently among trades dealing with the many forms of asbestos remaining in buildings. Anyone working with asbestos without adequate personal protective equipment (PPE) can carry the fibers home undetected on their shoes, clothes, and hair, leading to secondary exposure for family members. Environmental exposure and accompanying high rates of lung cancer, asbestosis, and mesothelioma are also clearly observed among people living near asbestos mines or factories with no occupational or secondary exposure. Sources disagree on the length, but for all asbestos-related health problems, symptoms generally do not occur within the first 10 years of exposure and may still emerge after only 50 or 60 years.

Because of the long latency period and the many ways of being exposed to asbestos, it can be difficult to identify sources and levels of exposure in individuals, even though patterns on a larger scale are plainly evident. A recent case study describes a man diagnosed with mesothelioma who had a short-term high-level exposure—remarkable because it was less than was previously thought necessary to result in mesothelioma—but the authors also noted that he came from an area known for high environmental exposure, and that it could be both or even just the environmental asbestos that is to blame (Hinkamp et al. 2020). This is pertinent in considering health outcomes among bookbinders, particularly those who may have used asbestos handles in the 1950s to 1970s, as there would almost certainly have been other sources of exposure given the ubiquitousness of asbestos.

Asbestos use increased consistently from the late 19th century until it peaked in the European Union (EU) and US in the 1970s. The last US asbestos mine was closed in 2002 and in Canada in 2012, although it continues to be mined in Russia, Kazakhstan, and China. However, despite a gradual decline of use, then a complete ban on new asbestos in the EU as of 2005 and Canada in 2018 (with some exceptions for asbestos-containing materials [ACMs]), rates of mesothelioma cases have only begun to slow down in the past several years because of the long latency period. The US passed a ban on chrysotile asbestos in March 2024, but with a 12-year phase-out period, it means that chrysotile can still be in use through 2036.

Insurance and Asbestos-Related Injury Claims

In England and Wales, the Limitation Act of 1980 sets a statutory limitation of three years from diagnosis of asbestos-related illness to make a personal injury claim for compensation; however, because of the long latency period, there is no limit on the length of time between exposure and diagnosis. It is also possible for the executor to claim after a person's death. Furthermore, if the company no longer exists, its insurance

provider is liable. If it is not possible to trace the employer or insurer, a small claim can be made with the government.

Employers are required by law to hold employers' liability insurance, which would need to specifically cover working with asbestos. If a policy did not cover workers to deal with asbestos and a personal injury claim was made, the employer would need to cover the claim, at £137,000 to £153,000 on average between 2007 and 2012 and likely higher now (Department for Work and Pensions 2014).

In America, the average compensation for mesothelioma claims is upward of $1 million (Jewett 2014), and asbestos-related claims led to the bankruptcy of 120 companies by 2020 (Fletcher Davis 2020).

FINISHING TOOLS

Finishing tools feature a brass or bronze tool embedded in a wooden handle and have generally been sold with the handles attached. For handle letters and decorations, the polished, engraved face bears the design, supported by the metal underneath, known as the table. From this extends a comparatively rough, tapered, square-profiled stem of metal called the *shank*, which is inserted in a hole drilled in one end of the handle—the inserted part of the shank is called the *tang* (fig. 1). Smaller decorative tools, gouges (curved lines), and pallets (straight solid or decorative lines) generally do not have *tables* but just a *face* at the end of a shank, which is flat in the case of pallets. British tools in particular have a ring between the exposed shank and the tang, known as a *cushion* or *bolster*. When the tang is fully inserted in the handle, the cushion makes a sort of cap. Decorative rolls and fillets (rolls with straight lines) are brass or bronze wheels that rotate on an axis held between a fork (double carriage) or, later on, a single carriage. As with their smaller counterparts, they also have a shank inserted into a handle, but the handles are much bigger.

The table or shank is placed over a gas flame (historically) or hot plate (in more recent times), with the handle supported by a ring around the heat source. Once hot, the tool is impressed into leather or parchment coverings, either

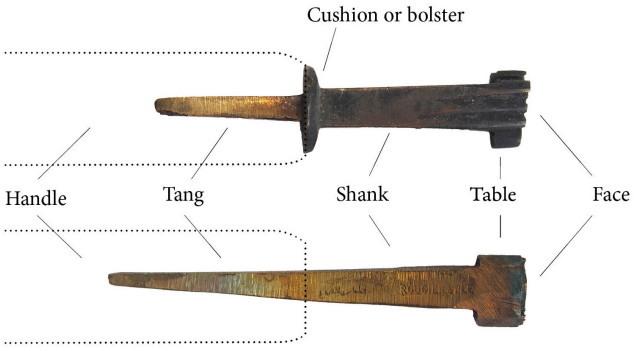

Fig. 1. Anatomy of a decorative finishing tool: English-style above and French below.

Fig. 2. A charred wooden handle that still holds onto the tool but drops unhelpful bits of charred wood onto the surface being worked.

blind or over gold leaf or metal foils. When carefully used, the wooden handle can last a long time, but if overheated or the handle is placed too close to the heat source, the wood will char (fig. 2). Too much of this and the tool will become loose and fall out of the handle, requiring replacement—an annoyance more than anything else, but particularly grating when it happens in the middle of a job. Various attempts to rectify this without making a new handle are commonly observed in old tool collections, but none are satisfactory for long (fig. 3).

It is clear that asbestos would have looked like a fantastic replacement for wood due to its thermal resistance. The mention in the Fahey book quoted in section 1 is the earliest printed reference found (1951), but it gives no detail on context. A 1964 issue of the *Guild of Bookworkers Journal* notes that Sydney (Sandy) Cockerell is "the manufacturer of . . . asbestos handles for tools" (Horton 1964). Marianne Tidcombe writes in the 1981 issue of *The New Bookbinder* that the idea came from Sandy's brother Oliver. Cockerell sold them as replacements for wooden handles, making them out of rolled-up asbestos paper glued together at the edge and sometimes with a metal tack to help hold it in place.

Asbestos handles are listed in the first four of a set of five order books from the Cockerell bindery, now at the British Library (note 1). The slim quarter leather books with marbled sides record handle sales from 1948 to 1987—a grand total of 24,230 handles over 39 years (fig. 4), peaking in the 1960s. The majority of sales were to institutions, binderies, and retailers, but there were some to individuals, and almost all in the UK. Widely recognizable names include Zaehnsdorf, Russell & Son, the London School of Printing, His Majesty's Stationer's Office, the Victoria and Albert Museum, the Royal College of Art, the Bodleian, University College London, the National Library of Wales, Tony Cains, Roger Powell, and Peter Waters (see the following).

Fig. 3. Charred wooden handles repaired with glue (left), cotton wool (middle), and paper towel (right). The latter two wiggle gently, like loose teeth. The glued tool slides out of the handle gracefully as soon as it is heated on the stove. Parchment scraps are another classic hole-stuffing material. It is unlikely that asbestos would be used for this purpose: tool stuffing is usually a makeshift, in-the-moment solution, mid-tooling when the metal drops out but the job is not finished. Cotton wool is a common material to use for a wet pad to quench hot tools against and is therefore likely to be nearby. If in any doubt, identification should be made by someone with adequate training.

Three handle sizes were available, differentiated by diameter to accommodate different sizes of tool: 5/8, 3/4, and 1 inch, often stamped with *DOUGLAS COCKERELL & SON* (fig. 5). Order quantities varied from two single handles to 1000, often in multiples of 50 or dozens, and many more for the 5/8 and 3/4 inch sizes than the 1 inch size. Prices changed yearly or more frequently, with price schedules noted in the beginning of the books; prices in February 1959, for instance, were as follows (note 2):

Handle size	Price each February 1959	Price per 100 February 1959	Price each, rough 2024 equivalent	Price per 100, rough 2024 equivalent
5/8 inch	1s 3d	£5 15s 10d	£1.70	£156.95
3/4 inch	1s 6d	£6 14s 0d	£2.04	£181.60
1 inch	1s 9d	£8 2s 9d	£2.38	£220.51

Several instruction cards tucked into the order books were presumably supplied with handles, instructing the user to enlarge a pre-existing hole in the handle to fit the tool and hammer the handle onto the tang (fig. 6). The cards proclaim this: "These will outlast numbers of wooden handles and so save time, expense, and the exasperation of loose tools." However, James Brockman, who worked for Cockerell from 1967 to 1973 using these handles, notes that they were imperfect—they did not hold onto the tang well, and tools eventually fell out anyway, or handles broke in half.

They were made of both a whitish-gray, softer asbestos paper or a browner, harder asbestos paper. Confident identification can be made only by testing individual handles, but both chrysotile and amosite have been found (Kevin Graham and Airborne Environmental Consultants, pers. comm., 2024), and both are known to have been used (James Brockman, pers. comm., 2024). Asbestos content in these loosely bound paper handles is likely to be 85% or higher (discussion with Airborne Environmental Consultants 2024). In this article, the rolled asbestos paper handles of both colors will be referred to as Type A handles to distinguish from a second type described later.

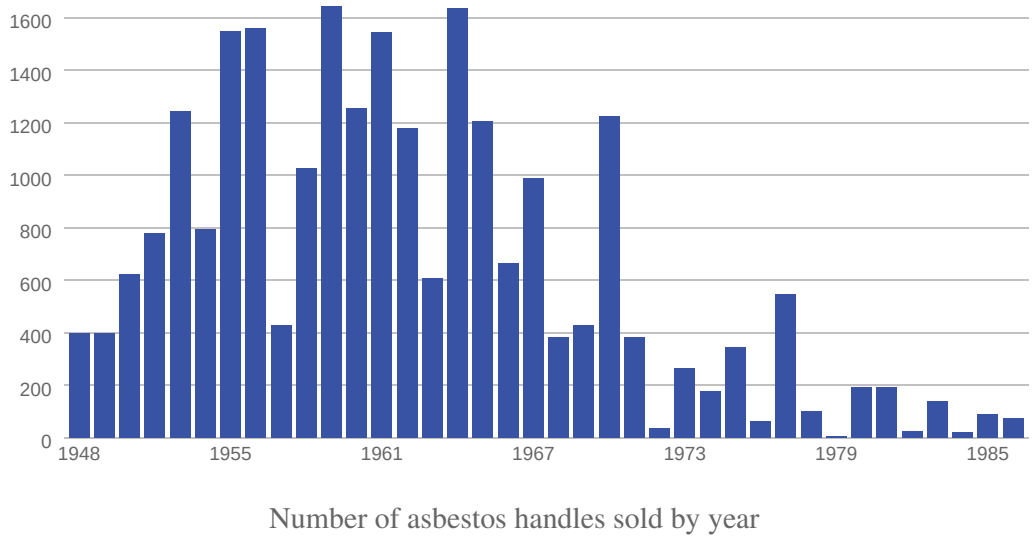

Fig. 4. The number of asbestos handles sold by Cockerell & Sons by year from 1948 to 1986 according to their order books.

Fig. 5. Stamped Cockerell asbestos handle. Courtesy of Todd Pattison.

Peter Waters, an esteemed bookbinder and conservator from the UK who later founded the conservation laboratory at the Library of Congress, worked with these handles in the 1950s, when he was in his 20s. Waters worked for Roger Powell, who had been Sandy's business partner until he established his own bindery in 1947. The Cockerell order books contain several orders from Powell and one handwritten one from Waters, dated December 3, 1955:

Dear Mr Cockerell,
Will you please send me fifty asbestos handles—25 of each size, and perhaps too, you could let me know if you will be able to supply Farnham School of Art with 300 (150 each size) as I am making out requisitions?
With best wishes, yours sincerely,
Peter Waters

COCKERELL ASBESTOS HANDLES
FOR FINISHING TOOLS

These will outlast numbers of wooden handles and so save time, expense, and the exasperation of loose tools. The following points should be noted when fitting the handles:

(1) Square ended tangs should be filed to a taper
(2) There should be a shoulder or washer on the tool for the handle to butt against.
(3) A suitable size of handle should be used and the hole in it enlarged with a bodkin or file tang to fit the tool.
(4) The tool should be held in a vice and the handle tapped on with a hammer.

Fig. 6. Reproduction of the small card found in one of the Cockerell order books with instructions for attaching asbestos handles.

According to Julian, Waters' eldest son, Waters spent several weeks using a lathe to shape factory-formed rods of asbestos into handles (pers. comm., 2024). It is hard to imagine much by way of respiratory protection for woodwork in the 1950s, but anything that would have been worn then would not be considered adequate asbestos protection now. In 2003, at age 73, Peter died of mesothelioma, which he attributed to that exposure about 50 years earlier. I found one other anecdotal report of a death resulting from asbestos exposure from finishing tools, but nothing I could confirm. Some of Powell's and Waters' tools found their way to West Dean College, where a number of asbestos handles were recently found—tapered toward the collar and rounded at the opposite ends and clearly made from rolled asbestos paper.

The goldbeater Whiley was the other known seller of asbestos handles, however, in their case, the handles—two different types—were already fitted to tools. It was not possible to determine who made them (it was not Whiley themselves) or if they were sold under any other name. The first is like the handles described earlier, but the pale gray rolled asbestos handles are capped at the business end with a dark copper alloy ferrule as if to help hold in the tang or prevent damage at this end of the handle (fig. 7).

Other Whiley tools fall under a second category that will be referred to as Type B here: wooden handles with asbestos resin ferrules (fig. 8). These ferrules appear at a glance to be metal: shiny and with a warm copper alloy coloring. However, any damaged areas will clearly show fibrous asbestos, although perhaps only with a microscope. Figure 9 shows

Fig. 7. Whiley handle letters with white-gray asbestos handles and brass ferrules. Courtesy of Paul Welters.

tools from a set in bad condition where the fibers were easily apparent at a distance. The use of this material combination makes sense if there was a strength/longevity issue with the asbestos handle holding up—use the stronger wood, but protect the edge that gets warm with the thermal insulation properties of asbestos. It is unclear how the tang is held in the tool; the asbestos ferrule is about 2 mm thick with air space inside. It appears that the tool is wedged into the wooden handle as normal and that the wood has been carved away to accommodate the thickness of the ferrule over it.

Although there were still some orders trickling in through the Cockerell bindery in the first half of the 1980s, James Brockman recalled that the alarm had been sounded about asbestos handles in the 1970s and binders were already replacing them for wood—or attempting to coat them with paint or tape to save the effort. However, Doug Mitchell remembered using asbestos handles at the Foreign Office up to the late 1990s and at the British Museum/British Library during his time there in the 1980s, saying that the latter replaced them only around 2007 when the British Library Centre for Conservation opened (pers. corr., 2024). It is still common now to find these handles among collections of old tools or even in secondhand sales.

Fig. 8. Whiley Type B tools with wooden handles and asbestos resin ferrules.

Fig. 9. Whiley Type B handles, of which the asbestos resin ferrules are damaged on the left and center tools.

IDENTIFICATION

Identification of asbestos is done by an asbestos surveyor under the microscope fitted with filtered extraction using various stains that interact with the different types of fibers. In the UK, it is only legal for someone with the right level of training to purposefully go looking for asbestos (as opposed to experiencing an accidental exposure), so if any professionals—including self-employed people—suspect that there may be asbestos handles among their tools, they need to ensure that training and insurance are in place for existing staff or bring in trained asbestos contractors. In the US, Occupational Safety and Health Administration (OSHA) Standard 29 CFR 1910.1001 also requires training and air sampling for anyone exposed to asbestos at work (OSHA 1994). Canadian Occupational Health and Safety Regulations SOR/86-304 10.4–5 requires a risk assessment by a "qualified person" to be kept for 30 years and air sampling during work with ACMs. Therefore, in all of these countries, someone with specific training in work with asbestos needs to be involved at least in the planning stages.

The following section is intended as a visual guide for when it is reasonable to suspect asbestos presence on finishing tool handles, but not a replacement for definitive identification. That said, it is reasonable to note that there are only a few other options for handle materials, and they are likely materials that conservators and bookbinders would be able to identify: the traditional wood, and some institutions, including the British

Library and Parliamentary Archives, also experimented with nylon on all sizes of tools, including rolls. Nylon (likely nylon 666) handles are a milky white or yellow-white, very smooth and uniform, and may be discolored near the tool end from heat. They are very clearly plastic and unlikely to be mistaken for anything else.

Any collections with tools made before 2005, when asbestos use was banned in the EU, should be suspected for possible inclusion of asbestos handles or prior contamination of wooden handles by neighboring asbestos (explained in the next section) (note 3).

Any sets of tools that have not yet been inspected for asbestos should be signposted as possibly containing asbestos and noting health hazards—wording is available from the HSE website on asbestos—and blocked off from access until an inspection can be carried out. If during inspection there is any doubt, asbestos should be assumed until testing can be carried out.

Wood

Wooden handles (fig. 10) were traditionally predominantly made from beech wood, left bare or finished (stained, waxed, varnished). They vary in size and shape as well: some are relatively shapeless dowels, whereas others are shaped at the ends for aesthetics and comfort. They may have shiny metal ferrules at the ends; look for signs that this is actually metal rather than varnished asbestos (see the following), such as dents or scratches on the surface where the shine is maintained. Each one I have seen has plainly apparent wood grain. Splits from a badly inserted tool or charring from an overly hot stove are obvious giveaways as well. If the cut edge of the wood is visible, it will look like end grain and not the tight spiral of something rolled. There may be a small hole in the end of the handle opposite the tool, from holding it in a lathe or an abandoned attempt at inserting a tool on that end. It will not be a regular hole that runs the length of the handle (see the following). It is unlikely that wood would be mistaken for asbestos, but assume asbestos in case of any uncertainty.

Fig. 10. Finishing tools with wooden handles.

Type A (Asbestos)

Type A asbestos handles can look like wood in color (likely made from amosite in this case) or like pale gray cardboard (likely made from chrysotile); they might have a mottled tone but nothing that looks like wood grain (fig. 11). Every one I have come across has a visible seam parallel to its length where the asbestos paper roll ends. The ends may or may not be shaped; if they are, there are likely visible fibers protruding from the sanded areas. Many tools show a tight spiral at each end from the rolling of the asbestos paper (fig. 12), but this is not always visible. There may be an air space or hole in the center of the roll or not. Some also have a metal nail or tack about halfway down the length of the handle. Even in handles that appear in good condition, there are usually fibers visibly protruding from the edges of the white-gray ones. Handles made by Cockerell may be stamped *DOUGLAS COCKERELL & SON* along the length (see fig. 5).

Fig. 11. A collection of asbestos-handled tools, many with corrosion on the cushions. They are all the white-gray type handles, except for the brown one second from right. Courtesy of Bronwen Glover.

Fig. 12. Cockerell handles viewed from the end away from the tool: on the left, the asbestos handle appears sawn, and on the right, the uneven rolling is visible. Also note the large hole in the center on the left. Courtesy of Todd Pattison.

Brown-colored asbestos handles can easily be mistaken for wood at first glance.

Survey respondents were asked to report the type of tools on which they had seen asbestos handles: the majority said decorative tools, handle letters, and pallets, and one person added in type holders (all smaller handles); only a couple had seen them on fillets or rolls, which would have much larger handles. Orders in the Cockerell order books suggested that the 1 inch handles were used for type holders.

If a handle is entirely coated in tape or paint, it may be wood, but asbestos should be suspected; there is not an established tradition of painting wooden handles, and this may be an attempt at encapsulation. Another feature that is not at all definitive but can be an indication is green corrosion only on the cushion (i.e., the part of the metal touching the handle), which is visible on many asbestos-handled tools (see figs. 5–8).

Type B (Asbestos and Wood)

Type B handles have wooden handles and asbestos resin ferrules, and I have only seen them on tools sold by Whiley. The majority of the handles bear all of the features of the wooden handles noted previously. The ferrule is a dark, shiny, warm brown and gives the impression of a copper alloy with a patina; it is roughly 14 mm wide × 2 mm thick. The wood touching the ferrule may have a slightly darker wash of color from sloppy varnishing of the ferrule, visible on the tool on the left in figure 9 and on the right in figure 10. From the edge, tight concentric circles are visible. When the tang is not centered perfectly, a gap is visible behind the cushion. Pale gray fraying fibers may not be easily visible on undamaged tools but can often be found by microscope at the edges of the ferrule.

SAFETY OF ASBESTOS TOOL HANDLES

There is no solid information available on the specific impact of these tools on the health of their users, and as in many other areas, men have been more studied than women, so the data is not necessarily universally applicable (IARC Working Group 2012a). There are some studies linking bookbinders (alongside other printing industry workers) with increased rates of asbestos-related cancers (Il'icheva and Zaridze 2004; Seyyedsalehi and Boffetta 2024), but this is a broad category of workers who would likely be exposed to other sources of asbestos as well as other carcinogens. It might be illuminating to collate data on causes of death since about 1960 for people whose profession is listed as bookbinder in areas where asbestos handles are known to have been used. However, when I contacted the British Office of National Statistics for this data, I was told it was too small a population to release the information under General Data Protection Regulations. This would not give a conclusive picture of exposure just from finishing tools, however, as asbestos was also in other equipment such as blocking presses and cooling mats for finishing tools, as well as papers and boards—and in many other products around the home and other buildings.

Asbestos risk is related to the particular type of asbestos itself, how high a content of asbestos to binder or other material is present, and how tightly it is bound in the matrix (or how friable it is—defined by the US as "crumbled, pulverized, or reduced to powder by hand pressure" (US Environmental Protection Agency 2020) and by the UK as "easily crumbled or reduced to a powder" (Health and Safety Executive, n.d.). Kadec reported an 85% asbestos content in Type A tool handles they have analyzed, both amphibole and serpentine asbestos, and note that anything used for insulation purposes should be considered friable. Finishing tools are often dropped handle down into a box for storage, with some shaking of the box to align the tools and fit the last several in. There is also pressure applied on the tool during use that would put a strain on its secure hold in the handle, so at both ends through normal use, the handle would be subjected to the type of wear that would release fibers and cannot be considered a safe thing to continue using. Individuals tempted to make their own decisions about what personal risk they want to assume should remember the environmental and secondary exposure routes for asbestos; that without adequate PPE and training, they are likely exposing others around them; and for those in the UK, it is illegal to use ACMs.

Unfortunately, any wooden handles not fully and perfectly lacquered, stored alongside asbestos handles, would be at risk of cross-contamination: asbestos fibers from neighboring tools can be lodged in the wood grain. Boxes with no tools should be carefully assessed for the likelihood that they may have had asbestos handles in them at one point—for instance,

a set of wooden handle letters in its original box is unlikely to have been used to store other tools with asbestos handles, as it would not make sense to put them together, but decorative tools, pallets, gouges, and so on may have moved around in storage boxes over time. The boxes themselves would also have the same risk.

Tool handles made after 2005 (when asbestos was fully banned in the EU) and never stored with old tools would not be a risk.

MITIGATION

Regulations on Working With Asbestos

In the UK, work with ACMs is regulated and categorized into three tiers. Nonlicensed work can be carried out by anyone with training following the requirements listed in the Control of Asbestos Regulations 2012, which include specifications for training, risk assessment, safe systems of work, and so forth. Notifiable nonlicensed work can also be carried out as mentioned previously, but the relevant enforcing authority (local authority or the HSE) must be notified in advance, with medical examinations carried out and records kept. Training is required under the legislation for anyone undertaking either nonlicensed or notifiable nonlicensed work on asbestos. The final category, notifiable licensed work, is to be carried out only by a licensed contractor who has notified the enforcing authority at least 14 days in advance. It is illegal to carry out licensed work without a license.

Training for work with asbestos falls under three categories: asbestos awareness training, which is intended only for incidental contact with asbestos (not for any work on it); nonlicensed asbestos training, which would be adequate for nonlicensed and notifiable nonlicensed work on asbestos; and licensed asbestos training required for the higher-risk licensed work. Asbestos awareness training is on the order of £15 to £20, and nonlicensed asbestos training is around £250.

The HSE website states that "the employer of anyone whose work might involve asbestos has the responsibility for deciding how much risk the proposed work presents" (Health and Safety Executive, n.d.). (The 2012 regulations define a self-employed individual as both employer and employee for the purposes of following the guidance.) This risk then determines whether the risk is nonlicensed, notifiable nonlicensed, or licensed. Detailed guidance for meeting each category is given, and too exhaustive to repeat here, but it is all based broadly on how likely the ACM is to release fibers, on how many fibers are likely to be released, and how often the work is carried out and for how long. The HSE also provides specific examples for each category, but all relate to the building trade, so some interpretation is required for our context; the HSE and local authority both declined to give advice about finishing tools when asked. Trained asbestos contractors and educators consulted for this article all reported an opinion that removing Type A tool handles would count as licensed work. Type B handles have not, to my knowledge, been assessed, and therefore no removal should take place before an assessment occurs. This would involve attempting to remove the handle under controlled conditions, using a tent to contain the area, negative air pressure to extract and filter the air, and monitoring of how much fiber is released into the air. The results of how much fiber is released would then categorize it as nonlicensed, notifiable nonlicensed, or licensed. Kevin Graham, a licensed asbestos contractor who has removed Type I handles, reported the results of his monitoring in these circumstances, finding a release of 5.5 fibers per cubic centimeter of air, which would certainly exceed the legal UK limit of 20 fibers per cubic centimeter of air if the control measures were not in place (pers. corr.).

While the focus here is on the UK for reasons of scale, as the US is the other main place these tools are found, a quick overview of the legislation is worth including. In 1989, the Environmental Protection Agency (EPA) banned most ACMs, but in 1991, the ban was overturned by the Fifth Circuit Court of Appeals. Trump-era restriction of the EPA's powers curtailed recent attempts until the Biden administration finally restored its ability to regulate in this way, and in March 2024, the ban on chrysotile asbestos was passed—although with a 12-year grace period and no ban of other asbestos types. However, all asbestos is still regulated as a hazardous substance, notably for this context, by OSHA. The permissible exposure limit (PEL) of an average of 0.5 fibers per cubic centimeter over 8 hours is half as low as the UK's limit, but a short-term exposure limit of 2.5 fibers/cm^3 for 30 minutes is also given. The US specifies in Standard 29 CFR 1910.1001 the regulations for training, air quality/exposure monitoring, PPE, labeling, and cleanup, among others (OSHA 1994).

Asbestos waste disposal in the US is covered by the federal Toxic Substances Control Act 40 CFR 173 as well as state air quality legislation, so regulations will vary by state. California's Department of Toxic Substances Control website has a general minimum guidance, but local legislation should also be consulted. Waste should be wetted and double bagged, labeled in a specified way, and disposed of as hazardous waste. Less than 50 pounds of household or business asbestos waste can be delivered by the household or business to a hazardous waste collection facility, with some further requirements for businesses (State of California, n.d.).

Encapsulation

Encapsulation is the term used for covering or coating asbestos in a material to contain it. Several people asked through the survey if the handles could be covered with tape, paint, or something similar, or noted that they knew people who did this. It is illegal to use asbestos in the UK, and so even if it were safe, it would not be allowed. However, it is still quite possible

for the tang to become loose and the tool to drop out, releasing fibers, so encapsulation does not make the handle safe for use.

It is possible to coat historically important, contaminated wooden handles for tools that will not continue to be used, but this is a more expensive option than removal. This has been done for tools in museum collections. Anyone wanting to retain examples of asbestos handles could also construct a sealed Perspex/Plexiglas box that would permanently enclose the handle.

Bagging and Removal

The easiest and least expensive way to solve the problem of the asbestos handles is to get rid of the entire tool. It is common practice to double bag asbestos waste and label it as such before disposal in line with local asbestos regulations. Some jurisdictions specify the thickness of plastic bag, the wording on the label, and wetting of the asbestos, so it is worth consulting local regulations first.

Untrained people should only be in the position of doing this if there is an accidental exposure. Employers (including the self-employed) should not ask or allow untrained staff to look through tool collections trying to find any asbestos handles, as this would invite exposure. Bagging by an asbestos contractor might cost on the order of £500 at the time of this writing.

If asbestos is accidentally discovered in the course of work, such as a sudden recognition of an asbestos handle among a collection in use on a finishing stove or opening a box of second-hand bookbinding tools to find an asbestos handle inside, work should stop in that area until all appropriate measures can be taken. Put up a warning sign and close off the space to anyone who might pass through. Clean small amounts of dust/debris by wiping down surfaces with damp rags; *do not use a standard vacuum*, as there are particular filters that must be in place for asbestos. Dispose of the rags as asbestos waste (double bagged and labeled) and record the event in the appropriate health and safety logs, then decide whether a licensed contractor is required to further assess or clean up the area. Detailed emergency procedures can be found in Equipment and Method Sheet 1 on the HSE asbestos website.

In many areas, asbestos waste can be disposed of free of charge at local authority hazardous waste disposal centers. However, it must never be placed in normal rubbish streams.

Tools can also be bagged and labeled for safer, longer-term storage while a decision is made about disposal or replacement. They should be placed in a low-traffic area, and their presence should be recorded by the person responsible for the health and safety of the institution.

Replacement

In the case of important or expensive tools, it might be preferable to remove the handles, clean the brass, and replace the handles with wood. For a sense of scale, a recent quote obtained from one asbestos specialist added up to £3500 for this work for the first 50 tools, plus £1000 for each set of 50 after that, based on costs for setting up a tent to work on-site, the number of tools a contractor could manage in a day, and cost of independent certification afterward that the space is safe for resuming work.

Decontamination

Any wooden, board, or cloth-covered boxes in which asbestos-handled tools were stored should also be disposed of as asbestos waste; asbestos fibers can be lodged invisibly in the grain or fiber matrix and cross-contaminate wooden tool handles later stored in those boxes. Best practice would also include having a licensed contractor clean any remaining wooden tool handles, particularly in collections where tools may have been moved around in various storage areas rather than always kept in the same place. A contractor can also assess whether decontamination of the surrounding area is also necessary.

CONCLUSIONS

In researching this work, I very much wanted to find a solution to the removal and replacement of asbestos handles that is affordable (i.e., nonspecialist) and safe. Many readers will be dismayed that the advice essentially boils down to either spending a lot of money, throwing away the tools (and possibly both if a storage or work area needs to be decontaminated), or keeping but never using them. There may be a temptation to downplay the risks of asbestos exposure or consider that if tools have been in use already, a little more use is not going to hurt, but it must be stressed that there is no safe amount of asbestos exposure. The individual fibers are invisible to the naked eye, linger for years, and can get easily transferred to other people, so any risks taken are not localized to the individual taking the risks but also to family members and colleagues. Even if the use or removal of these handles by a nonspecialist is legal in a given country, people ought to consider these risks as well as whether they have adequate insurance and protective measures in place.

This information is important, particularly as it relates to our tiny field and its niche tools, but I am concerned that upon reading this article, people unaware of asbestos handles might go looking for them among tool collections that may be little used, creating an opportunity for a health hazard that did not exist otherwise. Please exercise caution.

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APPENDIX

A decision tree is shown in figure 13.

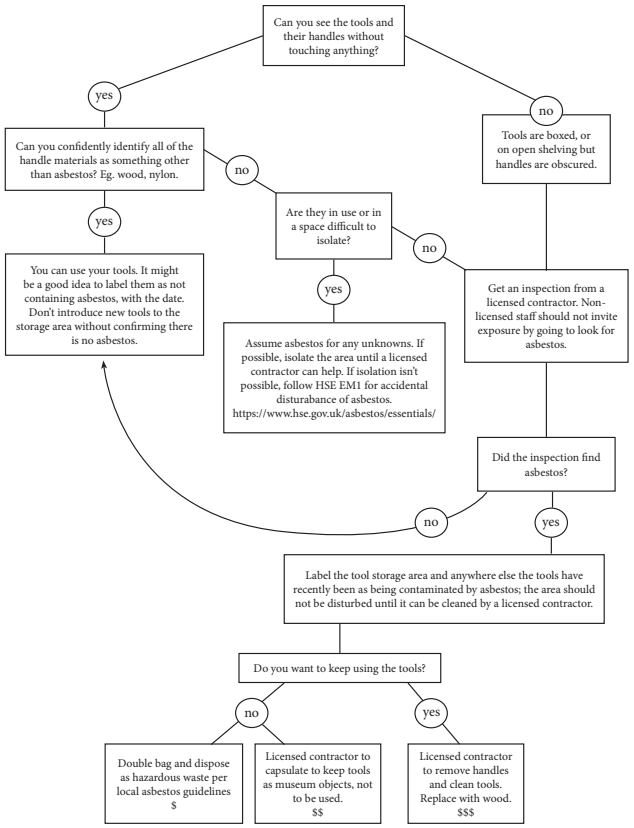

Fig. 13. Decision tree for employers, employees, and the self-employed.

NOTES

1. Add. MS 84227–84231, "Cockerell Bindery Papers. Orders for asbestos handles for finishing tools; finishing stoves; sewing frames; 1948–1988. Five volumes."

2. Inflation figures from the Bank of England Inflation Calculator available at https://www.bankofengland.co.uk/monetary-policy/inflation/inflation-calculator.

3. More photographs are available at http://www.bainbridgeconservation.com/asbestos.

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