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Perfumed Textiles

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As a museum professional, I work with memories. And nothing is more evocative than scent, which is at the same time both fragile and powerful. Perfumed textiles and costume are a standard part of every culture, yet few objects have been identified, and virtually none have been preserved. Perfuming was traditionally used to mask bad odors from use or from production processes like tanning and dyeing, for ceremonial reasons, or simply to create a favorable impression of the wearer. Perfuming methods included using incense, laundry aids, sweet bags, fragrant oils and fuming pans. Unintentional perfuming also occurred, of which we sometimes get a whiff in our museum collections.

Years of research have shown that museums and archives hold the key to this largely forgotten, intangible art. Inventories, tailors' bills, wardrobe lists, doctors' accounts, custom duties and other historical sources provide scattered but reliable bits of information about perfuming textiles. I began this line of inquiry as a reminder to conservators that they must also learn to recognize and preserve scented textiles, but this work constitutes not only a new discipline but also an immediately appealing, inspiring and thought-provoking aspect for anyone interested in textiles.

A professional perfumer and I have collaborated on recreating a series of scents, so we can now experience first-hand the smell of Henry VIII's perfumed shirts, Indian shawls redolent of patchouli, Casanova's handkerchief, the macassar oil left on men's hatbands and furniture, fragrant Japanese wedding kimonos, Paul Poiret's gowns sprayed with the first designer perfume in 1920, as well as modern technology's nano- and microcapsules embedding synthetic scent in athletic socks, business suits, and baby clothes.

Scent aesthetics

We don't yet know the boundaries – or contents – of scent aesthetics, but exciting things happen when we move outside our intellectual cubicle. Because the smell reaction bypasses our intellect, going directly to the hypothalamus, odors have an immediate emotional impact quite different from most thoughts, sights and sounds (Jellinek 1994, 58); in this more primal part of the brain, the smell is not so much identified as simply judged as whether we like it or not. When you notice a smell, your sensory organs unlock in you a subjective dimension, a memory, perhaps, or a feeling – a sensory experience inside the body. This doesn't happen if you're only *looking* at something. If you *smell* a roast turkey, for example, rather than just see it, all your memories of roast turkeys are activated – an instantaneous accessing of relevant information and memory. Smells can thus both create a sense of anticipation and a memory of the past – and gaining access to hidden or forgotten parts of our own history is a gift indeed.

Smells contain worlds of information, condensing time, culture and distance. Smell allows and provides different kinds of impulses than our usual ones. We human beings apparently absorb and store some information more easily through this sense (and remember it better). Smelling the

turkey (or activating our smell receptors) unlocks huge amounts of information contained in our experience – whether we are normally aware of them or not. This forms part of our intangible, culturally shared experiences, many of which seem to be universal across boundaries of time, culture and space.

It is not yet known exactly how the sense of smell works. It might be the size, shape, spin, wave length or vibration of particular molecules matching or interlocking with special receptors in the nose that cause us to react or recognize a smell. Only a few molecules are necessary for us to experience or identify scents, and characteristically, the worse a smell is, the less it takes to notice it. Our sense of smell is – or used to be – so important, that unlike other nerve cells, the olfactory neurons constantly replace themselves.

Smells are for us clearly culturally rather than physiologically defined. One system of categories assigns seven basic qualities to smells: ethereal, prickly, floral, minty, camphor, musk, and rotten, although other systems include such elements as garlic-like, aromatic, burnt, animal, and billy-goat.



Figure 1. The word perfume comes from (Fr.) per fumar meaning pleasant-smelling or literally, from the smoke: the oldest way of imparting a smell. Fragrances were once considered to be the souls of objects, and thus spiritual and sacred in themselves. Incense is used in religious ceremonies all over the world, and its fragrance is often noticeable on church vestments. Pope Benedict XVI blesses the altar on his visit to Brazil, May 2007. Photo: Boston Catholic Journal.

Perfuming history

Perfumes are substances whose fragrance gratifies the sense of smell. Perfume is generally made of the volatile oils of a large variety of plants, grasses, spices, herbs, woods, and flowers, the most important of which are bitter orange blossoms, jasmine, and rose. The Arabian philosopher and doctor Avicenna (980-1037) is usually credited with developing the technique of distilling aromatic oils from flowers, producing attar or otto. The process is also described in the Indian Ayur-Veda, one of the world's oldest medicinal systems, practiced for the last 5000 years. Before distillation was mastered, only fragrant resins from bark were used, generally burned to create fragrant smoke or used in the form of perfumed oils and salves. Perfume and incense were

widely used in ancient Egypt 4000 years ago. Arabian perfume arts were highly developed, using ingredients from China, India and Africa. In classical Italy and Greece perfume was also important, but its use disappeared with the decline of the empire. In 1190 perfumers in Paris were granted a charter, and the first modern perfume, called Hungary Water (based on rosemary), was made there in 1370 for Queen Elizabeth of Hungary. With her marriage in 1533 Catherine de Medici introduced perfume to France, which quickly became the European center of perfumes, and cultivating flowers for perfume became a major French industry. By the early 1800s so much perfume was being produced that it was accessible for everyone, and no longer reserved for the nobility.

Ingredients

Traditional and still familiar, perfumed oils such as patchouli, jasmine, cloves, bergamot, vetiver, cinnamon, sandalwood and balsam have all been used for centuries. Each ingredient has its own history of production, trade and use. For example, frangipani, often linked with perfumed leather gloves, stems from the 16th century Italian marquis Muzio Frangipane. The scent comes from the red jasmine's flower, often supplemented with heliotrope, citronella, rose, coumarin, cinnamon, sandalwood and musk. Gloves scented with frangipani were very exclusive and extremely expensive.

Perfumed oils are found in:	
flowers	cloves, hyacinth, mimosa, jasmine, orange blossom, roses, reseda, heliotrope
petals and leaves	lavender, rosemary, peppermint
leaves and stems	geranium, cinnamon, patchouli
bark	cinnamon
roots	angelica, sassafras, vetiver
tubers	ginger, iris
fruits	bergamot, lemon, lime, orange
seeds	bitter almonds, anise, nutmeg
resin	myrrh, Peru balsam, styrax

Figure 2. Sources of natural essential oils for perfumes (from Encyclopaedia Britannica).

Synthetic fragrances can mimic natural substances or create completely new ones, for example lily of the valley and gardenia, whose blossoms do not yield oils. The oldest artificial fragrance is the clove-aldehyde, discovered in 1833. The fragrant aldehydes smelling of fruits and berries that are widely used in the food industry today are cheap in their synthetic form, while other synthetics, reserved for perfumes, are extremely expensive. Floral scents have also been synthesized: rose and orange oils are called acetals and are cheap substitutes. In 1868 the chemist William Perkin created synthetic coumarin, which smells of new-mown hay and became important in men's colognes (and as one of the carcinogenic chemicals used in cigarettes up until the mid-1990s). He created it while looking for a solution to mask the foul smell of the coal-tar textile dyes that he had been the first to develop. This led to artificial musk and then to the artificial production of the scents of roses and jasmine and the very popular oil of wintergreen. In 1898 Ferdinand Tiemann discovered an aldehyde of citral and created ionone, a synthetic which

smelled of violets, whose essential oil had never before been extracted. Instead, violet fragrance had traditionally been provided by the ground, dried root of the iris, which was called violet or orris root. Roger & Gallet's violet perfume, the world's first, was an instant success in 1900. Today, new natural essences are being developed from algae, currant buds, pine needles and eucalyptus leaves. Producing perfume and fragrances today requires a colossal, potent, and rather unpleasant chemical industry.

Perfuming is a logical finishing step for dyeing processes that are especially smelly. Silk dyed black in the 18th century needed "sweetening" with a final bath of soap and anise, while woolen cloth had to be washed with linseed and soap and lavender boiled with weld, the plant universally used for yellow dyes (Roquero 1999, 38). The dyestuff orchil (archil, orseille), giving a purplish shade, is produced by fermenting lichens with putrid urine. A rather complicated process described as practiced in Paris in 1768 was said to give this dye bath – and the fabric dyed in it – a wonderful smell of violets (*En Dansk Farvebog* 1768, 31), though unfortunately, the exact method has remained a secret. Indigo vat dyes, involving the use of urine, leave a characteristic stench in textiles, despite most attempts to remove or mask it. Formal clothes for some 19th century Danish peasants were dyed with expensive black over indigo blue; these fine clothes were stored in closed wooden chests, only worn on holidays, and rarely, if ever, washed. No wonder women carried nosegays of flowers or herbs to church in the early 1800s! When the Swiss began printing imitation Javanese batik patterns in mid-1800s, they also added a final treatment of patchouli oil to mimic the smell of the original batik (Robinson 1969, 42). The famous Harris tweeds were traditionally perfumed with lichens during the dyeing process, and their noble fragrance (mossy and smoky when damp) became a valuable trademark.

Perfuming was also universally included in textile storage, from the lavender sachets in the linen cupboards of Europe to the patchouli leaves packed between bundled Kashmir shawls en route from India. Both Henry VIII and Queen Elizabeth I of England used sweet bags (sachets) to keep their furs smelling pleasant, and leather garments and books were traditionally re-perfumed in ornate steel fuming pans (Arnold, Hayward 2007). Apples and quinces were kept in wardrobes for their scent. Storage chests of redwood cedar reduced insect infestation because of the fragrant, potent fumes. Not only were herbs and scents meant to deter insect damage, they also disguised unwanted odors of disuse. With today's mass production, requiring long periods of storage and shipping, anti-stale-odor perfume is routinely added in textile finishings.

Examples of historical scented textiles

Where to look for perfumed objects? Every culture, at every time, seems to have had perfumed textiles. Perfumes were used not only in sacred and occult applications, but also medicinally long before they became popular for private use. Look for gloves, linens, underclothes, leather goods and hides, wigs, furs, ink, book bindings, furniture, chests, paper, shoe polish, and firewood. Cleopatra's ship of gold had purple, *perfumed* sails!

Information about perfuming of textiles can be found in published and unpublished source material in archives and museums. Letters, old dyers' manuals, and recipe books for housewives also reveal useful instructions. The combination and cross-checking between the history of technologies and modern analyses will yield more information than hitherto found in either discipline alone.

Handkerchiefs are probably the most commonly perfumed textiles that have survived, though none seem to have been reported as such. Casanova's handkerchiefs (ca 1750) were laundered in rosewater, ironed and sprinkled with Bulgarian rose attar. Goethe (1749-1832) kept a basket of freshly laundered, sun-dried handkerchiefs at his desk – just for their smell (while Friedrich Schiller had a basket of aging apples for the same reason). Victor Hugo said that to be a proper gentleman, one had to carry a perfumed handkerchief. Napoleon III preferred the scent of violets and Kaiser Wilhelm II lily of the valley – and they both led in fashion, also with their fragrances. After the fall of the monarchies in Europe, fragrances based on wild flowers became popular instead.

In the Renaissance, soft leather boots were perfumed with ambergris (a heavy, waxy material formed in the digestive tract of sperm whales) after the leather was tanned. Linens have traditionally been scented in the course of laundry and ironing: Henry VIII's shirts were washed in rosewater and musk in the mid-1500s. Catherine de Medici's perfumer masked poisoned gloves with scent when her daughter's mother-in-law was to be murdered in 1572. Lace collars and women's shifts were washed in lavender water and sprinkled with powdered orris root (from irises, but smelling of violets) around 1600. Expensive leather gloves from Paris were perfumed with frangipani or with intense, musky civet (secreted from the civet cat's perineal glands). Rubbing perfumed oils into a garment to sweeten it was called "frouting" in the 17th century (Cunnington, 1960). Indian muslin for the new, light gowns of the late 1700's was called *mousseline*, perfumed with vetiver (oil distilled from the roots of a perennial grass from India), and Indian cashmere shawls were doused with patchouli (essential oil from a tropical plant of the mint family) to prevent insect damage during the long sea voyage to the European markets. Japanese kimonos were perfumed with costly incense before wedding ceremonies; Mexican mourning shawls, called *rebozo de olor*, were perfumed with lichens. Hawaiian barkcloth, *kapa*, was perfumed with fern extracts during dyeing, and afterwards with powdered sandalwood to mask any residual odors from the fermentation process. During storage, *kapa* was interleaved with sachets of fragrant, native plants. In Europe, fashionable men in the mid-1800s began to use lavish amounts of "Macassar" oil, ostensibly increasing their hair growth, but leaving telltale stains and fragrance on hatbands and furniture – unless their wives had crocheted *antimacassars*. In Victorian times, ladies occupied themselves by embroidering lavender sachets, producing perfumed beads from macerated rose petals, and making perfumed glove boxes. Paul Poiret sprayed his new "Oriental" perfume on his winter collection of gowns in Paris in 1920 – the first time a fashion designer linked haute couture and fragrance. Gowns from precisely that show could undoubtedly be identified today, even if the fragrance is gone, by tiny, now brownish, spray drops on the fabric.

My initial research carried out in Denmark may help us find comparable sources elsewhere. Perfumed leather for jerkins is listed in King Frederik III's wardrobe inventory in 1651. The Danish king's tapestries were sprinkled with fragrant herbs before being rolled up for storage – and stolen by the Swedes – in 1658. Benches along the walls of the Queen's chambers at the Frederiksborg Palace had scented pillows in the mid-1600s. Perfumed gloves for Princess Anna Sophie's dowry in 1666 included 10 expensive pairs of gloves perfumed *à la Frangipane* and 23 cheaper pairs of gloves perfumed with ambergris. Her perfumed hoops and a grey hat perfumed *de Mouscowie* also lent distinctive scents to her wardrobe. There are reports of scented wallpaper and book bindings, as well as the use of perfumed firewood (leaving such fragrant residue in the

chimneys of the Rosenborg Castle that workers were allowed to scrape it out as part of their pay), perfumed wood inlays in furniture, fragrant powder for wigs and makeup, lacquers, pomades and lotions, and much more. An elaborately embroidered pillow from around 1700, perhaps actually a muff, contains rose petals, bitter orange peel, cloves, marjoram, storax calamita, lignum rhodii and tea leaves, both for fragrance and perhaps for medicinal properties. It is reported that Goethe sent a perfumed handkerchief to King Christian VII, though it does not seem to have been preserved. The Danish royalty's horses' tackle was perfumed in the 1800's with cloves and lavender. The original small gold containers with a few drops of the anointing oils used at coronations in 1700 and 1840 still exist: the kings were given a choice beforehand of several different scents. The kings' interest in cultivating suitable roses, herbs and other materials used for perfuming can be traced through the history of the royal gardens.



Figure 3. In the early 1600's fine linen ruffs were laundered in lavender water, ironed, piped, and stiffened with perfumed and sometimes tinted starch. In storage, they were sprinkled with powdered orris root and wrapped in linen covers. Portrait of a Danish Prince ca 1615 (detail). Nivaagaard Portrait Collection, Denmark.

Both historical and modern attempts have been made to create textile treatments that attract the opposite sex, while (preferably) repelling mosquitoes and moths. Perfumed tobacco, shoe polish redolent of sassafras, and laundry aids smelling fresh have all made their mark on textiles and costume of the 1900s. Since the late 1980s modern technology has enriched us with microcapsules of perfume in nylon stockings and athletic socks, and permanent, perfumed nanofinishings on cotton children's wear. The Korean textile industry is already a leader in stress-reducing fragrant finishings for businessmen's suits and ties, and treating bed linens to release minute amounts of pine forest scent, shown to encourage relaxation. Freeze-dried, perfumed material may turn up in new disguises in textiles where we least expect it.

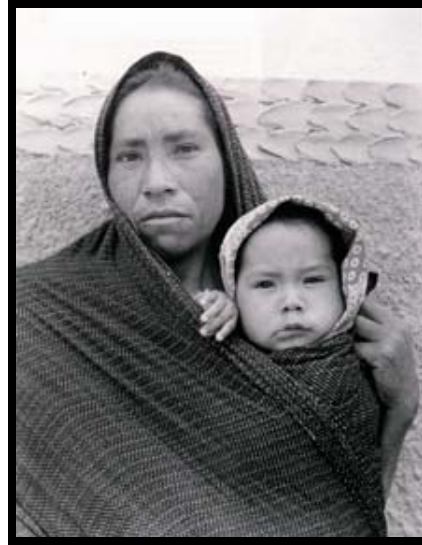
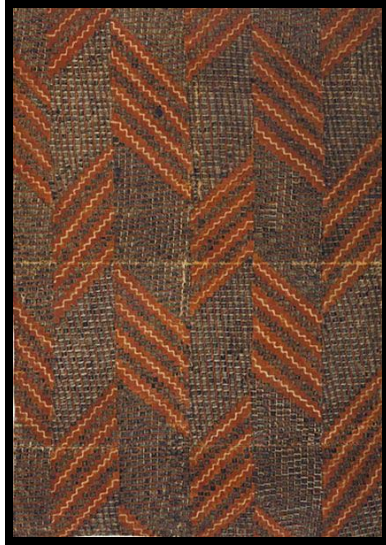


Figure 4 (left). 18th century Hawaiian barkcloth, kapa, was traditionally used for garments and mats. To mask the odor of its fermented fibers, kapa was either rubbed with coconut oil cooked with fragrant laua'e fern, or rolled up around bits of aromatic maile vine, or powdered sandalwood was pounded into the surface. Hawaiian kapa, Cook-Foster Collection at Georg-August University in Göttingen, Germany.

Figure 5 (right). The traditional Mexican rebozo de olor was a scented black shawl worn for mourning. To remove the unpleasant odor of the corrosive black tannin dye, the thread was treated in a final bath of lichens, flowers and herbs. Photo: Ruth Lechuga.



Figure 6 (left). The light muslin gowns of the late 1700's were perfumed with vetiver, from the roots of a tropical Indian grass. Danish Princess Louise Augusta, 1787. Portrait by Jens Juel. Frederiksborg Palace Museum, Denmark.

Figure 7 (right). Modern stockings can be made of nylon threads with embedded microcapsules of perfume. During wear, the capsules gradually break, constantly releasing small amounts of perfume. Stocking advertisement, Kanebo, 2006.

Identification

Residues and traces of scent in textiles can be analyzed by forensic and analytical chemical, botanical and pharmacological procedures. Dogs are good at recognizing smells, and even

computers can be taught how. As electronic noses already measure how fresh fish is, the quality of cheese and wine, find narcotics and explosives, and measure air quality in ventilation systems, it is not unthinkable that we can develop a machine to identify which perfumes have been applied to historical objects. In the meantime, we can improve our own natural abilities: vintners, master brewers and perfumers have all learned to discern and describe hundreds of odors. By isolating smells, perhaps intensifying them, and by working systematically, we can all improve our ability to identify smells. It is no more difficult than learning the alphabet or the silhouettes of enemy aircraft, or how to thread a loom. Expanding our understanding of the past with the sensuous dimension of smell is well worth the effort.

Revival, presentation and preservation

Once the components of a historic textile's scent have been identified, the question is naturally whether to try to revive or recreate it. Fixatives are always used to increase, intensify or prolong the odor of perfumes. In principal, reapplying a fixative to a perfumed object might indeed revive the remnants of the original scent. However, this cannot be recommended because we cannot be certain the result is correct, nor can we predict what effect such a treatment might have on aged and perhaps deteriorating objects. But if the original ingredients of a scent have been identified, there is no reason why the scent can not be recreated separately and presented as a suggestion of how the object might originally have smelled. Using the original fixative creates a long-lasting scent on a modern, suitably neutral material.

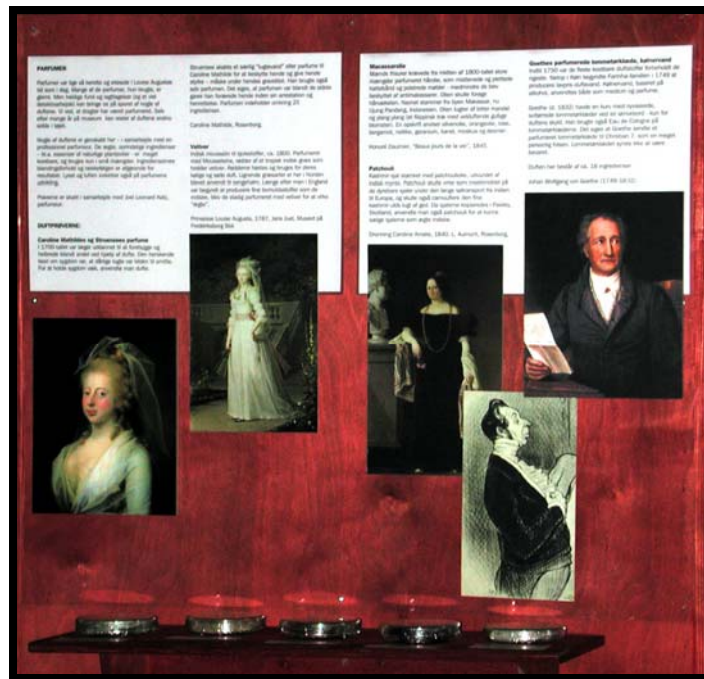


Figure 8. Samples of perfumed historical textiles appeal to museum guests. They find it a compelling and uniquely private experience – a valuable asset for museums which are competing with mass communication and popular entertainment. Reconstructed scents of historical perfumes have been presented at several costume exhibitions at the Royal Danish Collections and the response has been overwhelmingly positive.

A professional perfumer has helped me recreate some samples on new material, from historic recipes and descriptions. They can only be considered an approximation, as there are few precise

recipes, and the order in which the ingredients are mixed, as well as their amounts, can change the result considerably. The samples are shown with labels and illustrations, primarily because the visual impression adds another dimension, making them easier to remember. Pictures remind us of the past; odors make it live again! When smelling the samples: lift the lid of the glass dish and smell the sample. Don't touch it with your fingers or your nose, because then it will be difficult to smell anything else afterwards. If your nose gets "confused" or overworked, refresh your sense of smell by sniffing the back of your hand, where you smell of yourself (unless you've used a very perfumed lotion).

Scented textiles require special consideration when they are exhibited, documented and stored. Whether an identified or unidentified smell of a museum object is a valuable and desirable part of its historical value always needs to be considered. We may be the last ever to experience an object's fragrance or odor, and it thus becomes our responsibility to document and preserve it. We must ensure that scented objects don't contaminate each other, whether we find their smell pleasant or not, just as we ourselves are careful not to contaminate the artifacts we handle by not using hand lotion or perfume (ICOM Guidelines). Scented objects must be physically isolated from other objects in suitable packaging. Destroying an object's scent by airing, washing, dry-cleaning or other methods must be a conscious decision, and documented as such. Learn how to describe a smell, isolate the object in an inert container, and consult colleagues when in doubt – and to share the experience.

Secondary perfuming - that is, unintentional perfuming - may also be encountered in historical textiles. Perfumed smoke from burning juniper, cedar wood and cinnamon in fireplaces would have scented garments worn in 17th century Danish castles. After vulcanized rubber was invented in the 1840's, the *refraicheur* (a perfume bottle with an attached rubber squeeze bulb) became popular, allowing perfume to be sprayed not only on the neck and shoulders, but unavoidably also on the clothing. The cigarette smoke lingering in the Queen's gowns, the horsy smell in the jockey's silks, chlorine in bathing suits and incense in a bishop's cope all increase museum objects' information by leaps and bounds. Other secondary smells include mold, cosmetics, deodorants, disinfectants and textile production chemicals. But beware! Many of the most common chemicals in modern fragrance products are known to be harmful to one's health, which may account for the increasing number of perfume allergies. Modern technology is intent on creating new ways of appealing to our sense of smell – and offending it – creating problems in shopping malls, in public restrooms and, ultimately, in museum collections.

Conclusions:

Collect information. Apart from archival research and expensive analyses, we can even today, still collect information from older people about how textiles were scented in their youth. This may not be documented anywhere else – and our elders are happy to be asked.

Document evidence of perfuming. It is of paramount importance, as the more we know about former traditions, the more we will find. Though we might not yet be able to identify stains, powder residue, pulverized leaves and flowers, it is our responsibility to preserve this evidence for the future.

Preserve samples in clean and non-contaminating containers, preferably glass, which can be stored near the object itself, in the dark.

Keep recreated scents separate from actual historical objects, though they can be exhibited adjacent to each other.

Share and publish our findings – this is our responsibility when documenting the objects in our care, both for colleagues and the general public.

P.S.

As it is now possible to build not only fragrance but also certain sounds into textiles – in particular the very desirable “scoop” and rustle of silk – we should also remember to listen to our textiles!

Acknowledgments

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