Chapter 1

# The characterization grid

Upon visiting her editor's office for the first time, the author noticed a large picture hanging on the wall across the room. Due to a certain odd surface texture, the medium was not immediately apparent. Was it an oil painting, a photomechanical print on canvas, or something else? Walking over for a closer look, she asked, "What is it?"

"It's the New York skyline," he replied.

If you think that's funny, you must be a conservator.

This story highlights not only the dual nature of objects but also the characteristic bias that we conservators have for one side of it—the material side. This bias must be balanced by attention to the other, non-material, side.

The information to be gathered about an object during characterization involves both its material and non-material aspects. And a complete characterization requires information in another dimension—information not specific to this particular object, but, rather, generic information from outside the object that can be used to enhance our understanding of it. Characterization information can therefore be set into a four-quadrant grid with

| | Material aspects | Non –material aspects |
|---|---|---|
| **Object-specific information** | *Information*: Observed phenomena and their interpretation, materials identification, determination of structure.<br>*Source*: Object.<br>*Strategy*: Physical examination, analysis, imaging, testing. | *Information*: History of the object, current values, projected future.<br>*Source*: Custodian, others.<br>*Strategy*: Interview, consulting institutional records. |
| **Non-object-specific information** | *Information*: Methods of manufacture, material properties, deterioration studies.<br>*Source*: History of technology, materials science, conservator's knowledge of similar objects.<br>*Strategy*: Consult conservation literature. | *Information*: Information about related objects, art history, general cultural information.<br>*Source*: Allied professions, conservator's prior knowledge.<br>*Strategy*: Review literature, consult allied professionals. |

**Figure 1.1** Information to be included in a full characterization

material aspects on the left and non-material aspects on the right, information specific to the object on the top and generic information on the bottom. This grid is shown in Figure 1.1. It shows, for each of its four quadrants, the nature of the information to be gathered, the source of that information, and the strategy for getting the information from the source.

By gathering the information defined in all four quadrants, we assure that all appropriate information is at hand before decisions are made.

The grid structure emphasizes the equal importance of all types of information. It makes explicit the contribution of the scientific literature to object study and reminds conservators that they may need information from outside of the conservation literature. Categorizing information by source helps to assess its reliability, particularly in the distinction between material and non-material

aspects of the object. The grid also underscores the crucial role of custodians in treatment decision-making.

Let us look closer at each quadrant.

Quadrant I contains information that is specific to the object and material-based. This information describes the object's current physical state. It is generated primarily during physical examination, sometimes aided by ultraviolet fluorescence examination, raking light, magnification, technical analysis, and imaging methods such as infrared and ultraviolet photography and radiography. Tests on the object itself for cleaning and solubility are other methods for obtaining object-specific material-based information in the characterization phase.

Quadrant II contains information that is still material-based but not specific to the object. It involves the chemical properties and physical behavior of the component materials of the object and often comes from materials science. Another category of information in Quadrant II is the history of technology of the object type and its expected methods of construction. Together, this information enhances the conservator's understanding of findings from the physical examination by explaining signs of the object's creation and phenomena related to aging. The physical exam is a snapshot of the object at a particular moment in time, but data from materials science allow us to extrapolate from the object's current state both backward and forward in time to produce a picture of the object's material life.

Quadrant III contains information specific to the object but non-material-based. Particularly important in the methodology are the values the object has held throughout its history and those it holds for its current custodian and other stakeholders. Other Quadrant III information concerns the custodian himself, his planned use

of the object, and his preferences about its appearance. Yet other information relates to the object's history.

A professional custodian can usually provide most of the relevant information, the object's significance to the owning institution, and references to publications on it. Private owners, on the other hand, differ greatly in the information they are able to supply, and the information that they do have is occasionally mistaken. Private owners may have little knowledge of the object before it came to their hands but know more about the object's future unless, of course, the treatment is in preparation for sale. Acquiring the needed information about privately owned objects can be a challenge and may require consulting other sources. This takes us to Quadrant IV.

Quadrant IV contains non-material information that is not specific to the object. Such information relates to the history of the general type of the object under consideration. Also included is a wide range of cultural information: historic attitudes toward objects of the type, values placed on them by their makers and users, fluctuations in their market value, expected signs of use, historic viewing conditions and lighting, and traditional modes of care.

Although acquiring information in this quadrant sounds like a formidable task, much of it is already in conservators' heads. Knowledgeable custodians can supply some of it. Art history and fields outside of the arts can provide much more. Whatever the source, this kind of information is more important to treatment decision-making than is often acknowledged.

Chapters 2–5 discuss the characterization grid in more detail, one chapter for each quadrant. The remainder of this chapter provides further insight into why it is useful to keep the grid's four

categories separate in our minds while gathering information about an object.

## Material vs. non-material aspects of the object

The vertical division of the grid reflects the distinction between the material and non-material aspects of the object—between the physical reality of an object and its aesthetic and other non-material attributes. Clear thinking requires considering each side separately because it is impossible to "see" both at the same time. Examination of the physical details of an object is carried out with a different eye than the eye that takes in an object's aesthetics. In addition, standards for verifiability differ between physical data and the feelings people have when they look at it or think about it.

The overall viewing of an object is often referred to as "reading" it, because the automatic nature of the process is similar to the way people see written text. Anyone who knows how to read finds it almost impossible to see writing as squiggles rather than words. Just as a reader cannot assess the style of a typeface while reading a novel, a conservator cannot appreciate the subject matter or style of an object while comparing the texture of paint applied with a palette knife to the texture of paint applied with a brush, categorizing its crackle pattern, or assessing its percentage of loss. A "reading" of an object cannot at the same instant take in its overall appearance and its detailed physical attributes.

In order to examine the physical state of an object, the conservator must put aside the normal gaze and studiedly *not* read the object as a whole. Focusing on small sections of an object at a time is a way to assure that this shift takes place. Low power magnification enhances the process by revealing phenomena that often become visible with the unaided eye once they are

dissociated from their context. Art teachers sometimes produce the same effect by asking students to draw things upside-down.

This literal approach to looking is decidedly at odds with the "normal" gaze, but is a well-established phenomenon. The philosopher Arthur Danto asserts that looking at a work of art as a *thing* is incompatible with seeing it as art. Illusionism in art, he says, requires that the medium become invisible.[1]

Anthropologist Jacques Maquet has compared the aesthetic appreciation of an object—that is, seeing its meaning rather than its physical substance—to the act of meditation. Both, he says, involve concentration of consciousness, elimination of analysis or cognition, and the absence of self-interest. The object is seen as a whole, and the subject–object boundary softens. The observer is "only looking" and is immersed in the experience.[2] Nothing could be further from the detail-oriented focus of a conservator examining an object. But both ways of understanding an object are vital.

Curators and other non-conservators sometimes accuse conservators of being cold-blooded in their approach to objects. A physical examination must, however, look at the materiality of the object rather than its art-ness, style, quality, or subject matter. The right side of the grid is the place for those other aspects.

The distinction between the material and non-material aspects of an object is paralleled by the distinction between preserving the materials an object is made of and preserving the object

[1] Arthur C. Danto, *The Transfiguration of the Commonplace: A Philosophy of Art* (Cambridge: Harvard University Press, 1981), 124–125.
[2] Jacques Maquet, *The Aesthetic Experience: An Anthropologist Looks at the Visual Arts* (New Haven: Yale University Press, 1986), 25–33.

as a whole. Unless sufficient attention is paid to the object's non-material aspects, we may end up preserving the material but not the object's meaning. Removing an accretion that arose from use, repairing damage resulting from an historical event, or introducing a treatment material that prevents age testing—any of these could negate the purposes of an object's preservation.

Likewise, disassembling something and preserving its parts—something often done with building elements like the paneling of a room—can destroy the meaning even if all the parts are preserved. All too often, documentation is not sufficiently detailed to answer all the questions that will arise during reconstruction. Sometimes, the documentation is lost. In either case, the preservation of the object's value can be compromised even with all its physical elements intact.

## Object-specific vs. non-object-specific information

Equally significant as the division between the material and non-material aspects of the object is the division created by the grid's horizontal line—the division between information that is specific to the object and information that is general or generic.

The information in Quadrant II (material, non-object-specific) is a mainstay of conservators' expertise. It includes general knowledge about the properties and behavior of materials, methods of construction, and the history of technology. The contribution of this information to conservators' views of objects is so routine as to almost escape notice, but it would probably best qualify as the body of information that conservators uniquely possess.

The information defined by Quadrant IV (non-material, non-object-specific), on the other hand, includes general

information from art history and other material culture fields as well as history, anthropology, and sociology. The importance of this information in treatment decisions is not widely appreciated. Decisions about the treatment of a stone mortar, for example, should be no less informed by cultural information about mortars than by technical information about stone. Without the cultural information in Quadrant IV, the object on our laboratory table sits isolated from all of the objects that share its cultural history. A full characterization places the object in its broadest possible context; limiting the information gathered to what is known about the object at hand can leave us short of that goal.

The categories to which the object belongs, identified during the object-specific inquiries of Quadrants I and III, open the door to the investigations in non-object-specific Quadrants II and IV. In the stone mortar example, we would look on the material side for information about the behavior and properties of the stone and manufacturing methods for mortars. For the non-material side, we would look for information on how mortars are used and valued in their culture of origin and during their collection history. The combination would lead to an assessment of signs of use and meaningful accretions on the object and an ability to separate signs of use from subsequent damage, and residue of original use from museum dirt.

## Defining information relevant to the treatment decision-making process

The amount of information that could be gathered on any one object is virtually limitless. Physical descriptions including measurements, construction, and colors; material analyses and characterization; stylistic analyses and comparison to related objects; signs of use and environmental stresses; and the history of

the individual object and its type. It is therefore vital to limit the gathered information to what will be useful in treatment decision-making. Non-essential information will make the process more confusing. It might seem that the more we know about an object the better, but common sense dictates that we define exactly what we need to know to carry out a treatment properly. Conservators are seldom paid to do research.

Not all information that can be derived from the examination of an object is directly relevant to treatment decisions; much supports non-conservation concerns, like authenticity and attribution studies or studies of the history of technology. And although much of the art history of an object is irrelevant to treatment concerns, the art history tidbits that sometimes appear in published treatment case studies make it seem that conservators are not always sure just what is and isn't relevant. This is probably because the purposes that information serves have never been systematically described.

Within the structure of the methodology, information gathered in preparation for treatment supports the dual treatment goals of preservation and interpretation.

Certainly relevant to preservation is information bearing on an object's aging. This includes its likely physical response to its environment—to temperature and relative humidity, handling, pollutant gases, physical stresses, and so on. Such information helps us predict the behavior of the object during treatment and develop recommendations for its future care. It will tell us whether, for example, an article of clothing can be worn, a piece of sculpture can be exhibited outdoors, or a painting can be safely packed and shipped.

This information is derived from examination and from materials science and the history of technology—Quadrants I and II.

Damage and deterioration observed during the physical examination and the results of solvent tests provide information on the object's susceptibilities. In addition, the history of technology of objects of the same type provides information on the expected methods of construction, and this can be compared to the results of examination. Quadrant II knowledge of the behavior of the object's materials helps predict its behavior as a whole and augments the physical evidence of that behavior as seen during the examination. Yet another source of Quadrant II information is the conservator's experience with similar objects, further contributing to the prediction of behavior.

Much information relevant to object interpretation comes from the non-material aspects of Quadrants III and IV. A major contribution of the non-material side includes the values history (discussed in Chapter 4). The custodian brings whatever information he has access to, while information from historical studies on objects of the same type (Quadrant IV) fills in the blanks.

Ultimately, interpretation of the object comes from a combination of material and non-material information. Constructing a history of the object—its creation, use, context, and physical changes through time—combines all available information. (This is discussed in Chapter 7.)

Information relevant to both preservation and interpretation can, however, arise from any one of the four quadrants. For example, although the results of the physical examination primarily inform preservation concerns, examination also produces information that will be used in making aesthetic decisions. It should help to explain why the object looks as it does overall: how much of its appearance is intentional, how much due to later changes, and how the overall impression that a "normal" viewer would perceive is related to smaller-scale phenomena that can be identified technically.

Conversely, non-material information can be relevant to preservation concerns. For example, knowing that a painting's owners moved it back and forth between Florida and New York over a period of years would explain signs of environmental stresses observed during the physical exam. Under those circumstances, the painting would have been subjected to major changes in relative humidity as well as to vibration during shipping. Thus paint cleavage that is more extensive than would be expected for a painting of its type and age would not necessarily indicate an unusually sensitive structure but, rather, external conditions. This could be expected to influence treatment choices.

Treatment of many objects illustrates the roles that material and non-material information play in interpreting an object. An Egyptian sarcophagus treated in the author's laboratory appeared to have original (i.e., pre-use) repairs on top of which were areas of the design redrawn in an extremely sloppy manner. It seemed unlikely that such sloppiness would have occurred in ancient times. The known history of the object went back to only as far as 1920. However, a curator observed to the author that since the sarcophagus did not have the user's name on it, it was undoubtedly used for a person of relatively low standing. This fact made sloppy repairs before use plausible and, as a result, they were treated as part of the original object.

Information from private owners can be equally valuable. The author was once asked to examine an autographed baseball covered by a yellowish greasy film that obscured the signatures. The owner's remark that the object had been stored for decades in the bedroom of a chain smoker confirmed an initial suspicion that the film was from tobacco smoke and, given the familial relationship, there was a question of whether the owner wanted it removed.

In another case, certain scratches on an old clothing trunk could be attributed to hard use rather than neglect, based on their

location on the object and the owner's report that the trunk had belonged to a grandparent who had carried it over the Rockies in the late nineteenth century.

The combination of information from a variety of sources raises the conservator's level of confidence in the conclusions that will be used as a basis for treatment decision-making.

All the information collected and developed during the characterization phase contributes to conclusions about the object's current physical state and its physical and cultural history. Many of those conclusions are a routine result of compiling information. It is not appropriate at this point, however, to decide on a treatment. That decision belongs later in the decision-making process. "Later" may not mean a long time, but, however long it takes, step-by-step methodological decision-making makes the eventual conclusions more reliable.

Chapter 2

# *Quadrant I—The physical examination*

This chapter concerns Quadrant I of the characterization grid: information on the current state of the material object acquired during a physical examination. The chapter does not provide instructions on how to carry out a conservation examination. The overall purpose of the book—to present a methodology general enough to be applicable to all objects—makes such instruction impossible. The chapter, instead, describes and analyzes the phenomena that comprise a conservation examination.

One topic that will not be addressed in this chapter is condition. This may seem odd, since determining the condition of an object is typically considered to be a primary goal of examination. Condition, however, is neither a physical fact nor a direct observation. It is a *conclusion* that comes from a comparison of the object's current state with some other, presumably more desirable, state.

For some objects, the more desirable state is the "original" one. Any alterations since that time become, by definition, undesirable, and the more changes there are, the worse the object's condition is. However, the original state of an object is not necessarily its most desirable one. No one would say that

the Liberty Bell is in poor condition because it has a crack. The determination of the most desirable state of an object—its "ideal state"—requires serious thought and is discussed in Chapter 6.

There are many different kinds of examination. A registrar's examination is different from a conservator's and will yield a different set of observations. The view of an art historian or an exhibition designer will be different still. Conservators have their own ways of looking at an object and examine objects for different reasons at different times. This chapter focuses on the initial examination carried out in preparation for treatment.

At times, direct observation by the conservator will be augmented with the use of analytical equipment. The need for this, however, comes out of the examination itself. Data in themselves do not provide added value.

What exactly happens when a conservator examines an object? Certainly, conservators see things that non-conservators do not. The skill to make observations and to interpret them accurately requires both formal education and supervised experience, and improves over time. Expert examination of an object involves a complex set of behaviors that quickly become automatic. The question of what actually goes on during a conservation examination is therefore an interesting one.

## First impressions

The information that an object will ultimately yield does not become apparent the instant that a conservator first lays eyes on it. Yet, many conservators, particularly inexperienced ones, feel that they should be able to make significant pronouncements instantaneously. The pressure to do so is particularly strong if the

custodian is peering over the conservator's shoulder during the early "just looking" stage; conservators tend to feel apologetic about appearing to do nothing.

The temptation to make judgements prematurely must be resisted, however, at the risk of the conservator's later regret. The lack of bright or controllable light or viewing aids increases the risk of making a mistake, but even under the best of circumstances, quick judgements are often mistaken. The experienced conservator keeps herself from being drawn into speaking prematurely with strategies like uttering a string of hmmm's, muttering that it will be interesting to look at the object more closely, or promising a written report.

The idea that an expert is expected to be able to say something profound at first contact with an object is based on a concept that was expressed, if not originated, by Max Friedländer. He believed that "[t]he first impression is deeper than all subsequent ones" and that an initial glance at a painting without considering the full complexity of its artistic form produces "inner certainty."[1] Friedländer was referring to judgements on dating, attribution, and artistic quality rather than a material examination. But the idea that first impressions of all kinds are the most valid ones has taken strong root. This notion may be the basis for conservators' feeling that any hesitation in making a sweeping statement about an object signals a lack of experience or knowledge.

Whether or not Friedländer's theory is valid—even in the limited context for which he expressed it—a conservation examination

[1] Max J. Friedländer, "On Art and Connoisseurship," in *Historical and Philosophical Issues in the Conservation of Cultural Heritage*, ed. Nicholas Stanley Price, M. Kirby Talley, Jr, and Alessandro Melucco Vaccaro (Los Angeles: The Getty Conservation Institution, 1996), 152.

cannot feasibly follow this model. Unlike the assessment of an object's aesthetic impact, a conservation examination must address its details. Details do not reveal themselves immediately, even to the most experienced practitioner. Once an observation is made, its meaning often seems obvious. But making observations and drawing conclusions involve several separate mental steps that require effort and application of a great deal of knowledge. All this takes time. It is difficult to describe why this is true, but it is[2]

On the other hand, the initial impression of an object is a crucial piece of data that will be useful during the treatment process. The conservator should therefore make an effort to fix it in memory. Photography will not necessarily capture it. The object may look bedraggled or ridiculously shiny, or the subject matter may be hard to read. The first impression may be the closest the conservator will come to seeing the object as a custodian or other non-conservator does. Since treatment is ultimately supposed to satisfy the eye of the non-conservator, it must address the problems that the object presents to the ordinary viewer at first view, before our professional vision takes over.

Conservation training propels us to look for the physical details that prompt our initial response to an object and to assign probable causes to those responses. From this comes a generalized idea about what the object might look like after treatment which, in turn, comes from a mental compendium of similar objects the conservator has seen or worked with. The conservator may have in mind, for example, the impression given by a large case clock

[2] Neuroscientists have actually studied this phenomenon, which they call "relational memory." It is described as "a person's ability to discern connections among pieces of information encountered in novel situations." said to be a "key to flexible decision-making," it "improves as time passes after exposure to new information." B. Bower, "Sleep on it," Science News 171 (2007): 260–61.

with a suitably glossy surface, as compared to the impression given by a dull-looking clock presented for treatment.

The first impression will also be used as a benchmark against which more detailed findings from later in the examination process will be tested. If the first impression of an object is that the surface looks lifeless or blotchy, or that the object gives off an air of neglect, the conservator must identify the physical details that contribute to that impression.

The contrast between the first impression of an object—which is more or less the impression of the ordinary viewer—and the view that a conservator takes during an examination is a significant one. Custodians and other interested parties see an object before treatment and after. Between those viewings, the conservator's analytical and, one might say, picky view takes over. As a treatment nears its end, however, the conservator needs to turn off her professional gaze and take on the custodian's eye again, aided by her mental snapshot of the object before treatment. After sweating over the filling and inpainting of a loss in a flat black area, it is difficult for a conservator to stand back and view the whole object without staring at "that damned spot" even if a normal viewer might be unlikely to notice it.

This shift in viewpoints is analogous to the purpose of a raking light—a way of looking at surface irregularities that is a vital part of the examination of many objects. When a treatment is nearing completion, the conservator must both physically *and mentally* turn the raking light off. Raking light shows the conservator what must be seen in order to produce an object that looks good when it is *not* in raking light. The conservator's first look at an object is an important step in fixing the object's "normal" appearance in mind. This is a very different way of seeing an object than what is revealed by a physical examination.

## "Just looking": the observant state of mind

The first step in most examinations is an examination of an object by eye under a bright light, sometimes aided by magnification or other viewing aids like binoculars. This initial consideration of an object often appears to be aimless. It is anything but. There is definitely a period at the beginning of an examination during which the conservator "just looks." But the conservator does have an agenda, conscious or not. Even while "just looking," the conservator is corroborating materials identification, determining the physical state of the object, and observing signs of its history and behavior. She is looking for signs of the object's construction, such as brushstrokes, toolmarks, and seams; signs of aging, such as cracks, fading, and surface deterioration; signs of use, such as localized abrasion, scratches, and purposeful accretions; telltale signs of material that is not original, such as incongruities of texture, color, or layering that might signal a discontinuity; and signs of instability, such as flaking paint, broken threads, and undermined wood surfaces.

Sight is not the only sense employed during examination. Tactile observations are often crucial, from the temperature-conducting qualities of a material to the weight of the object. In some cases, the senses of smell and hearing yield useful information as well. Tapping the surface of a painted object can produce a range of sounds that helps to locate hidden voids. Many objects "ring" differently if they have significant discontinuities. Conservators have been known to use their sense of taste on occasion, but do not brag about it.

Expectations created by whatever pre-examination information has been collected are cross-checked by a search for anything unexpected. It would seem logical to claim that the beginning of an examination is the conservator's introduction to the object. There is often, however, an earlier stage that involves

the conservator's predictions about an object based solely on a description of it by the custodian. Either the assumptions or the description may turn out to be mistaken. The search for disconfirming evidence is therefore vital because the treatment itself serves as a reality check. If a conservator sees only what she expects to see, and nothing else, some stage of treatment may, disastrously, expose her error.

The early stage of examination is similar to the stage in phenomenological analysis of data referred to as "immersion." This is "the stage of steeping oneself in all that is, of contacting the texture, tone, mood, range, and content of the experience" without a specific goal.[3] The observant state of mind required for this vital step is a capability achieved only after the acquisition of a great deal of knowledge and supervised experience. Observation at this early stage is not linked with the trains of logic required to figure things out to a reasonable certainty. Nor is it associated with the formulation of proposed treatment plans or even with the first-stage interpretation of findings. It is, nonetheless, a crucial aspect of becoming familiar with the object.

Examination, especially at the "just looking" phase, cannot be formalized and should not be overly systematic. It has no consistent protocol. An observer who proceeds one category at a time, as if using a checklist, will be working at a disadvantage. An examination is a search for clues, and some of the clues lie buried in the conservator's responses.

The examination process requires an expertise that even conservators are only minimally aware of. Emotions and instincts can point to something hidden. A surface that is shinier than expected, something too sloppy or too regular, something odd

[3] Michael Quinn Patton, *Qualitative Evaluation and Research Methods* (Newbury Park, California: Sage Publications, 1990), 409.

or unsettling, may catch the attention. Several areas of careful inpainting together with several sloppy ones, for example, would require some explanation. What will be found during examination is entirely unpredictable and requires intimate engagement with the object as well as careful preparation that has "mental, physical, intellectual, and psychological dimensions."[4] Once conclusions are drawn, they seem obvious. They are not.

The role of emotion in science is not unique to conservation and is unavoidably intertwined with more cognitive approaches. Nelson Goodman observes that scientists in a wide range of fields legitimately employ emotion in their investigations, even when their aims are purely theoretical. The objectivity required in science, he notes,

> forbids wishful thinking, prejudicial reading of evidence, rejection of unwanted results and avoidance of ominous lines of inquiry. Yet the need for objectivity does not forbid the use of feeling in exploration and discovery, the impetus of inspiration and curiosity, or the cues given by excitement over intriguing problems and promising hypotheses.[5]

For conservators, the emotional response to an object on first view represents important information.

## The shift into making specific observations

At some point, the "just looking" stage shifts into one where certain perceived details separate themselves from the background noise. The conservator begins a sorting process, focusing

[4] Ibid., p. 201.

[5] Nelson Goodman, "Art and Inquiry," in *Aesthetics Today*, ed. Morris Philipson and Paul J. Gudel (New York: New American Library, 1980), 313.

in on phenomena relevant to the object's physical being and ignoring phenomena related to style, subject matter, and other "irrelevancies."

It is important that judgements not be made prematurely. If a narrowing of focus occurs too early, the conservator can miss information vital to understanding the problems that the object presents. On the other hand, if phenomena unrelated to treatment issues are not eliminated from consideration, the result is confusion and increased difficulty in homing in on the real issues.

The difficulty of pulling meaningful observations from complex phenomena, establishing a focus that is not too wide nor too narrow, has been discussed elsewhere. "One only sees what one is looking for," observes Heinrich Wölfflin, "but one looks only for what one can see."[6] The process during which the conservator looks at an object and picks out relevant phenomena for further consideration is at the heart of our professional expertise and uses a major portion of what we know. Before conclusions are drawn, before observed phenomena are even described in words, the relevant phenomena must be identified.

Observations gleaned from the examination of an object are central to treatment planning because they are a matter of physical fact and act as a foundation for everything that is to follow. Because of this status, examination-derived observations should be kept mentally separate from all other sources of information, particularly the non-material. The investigation of non-material aspects of the object must be carried out as carefully as the examination of the physical object, but culture-based and personal judgements should be kept separate from physical facts.

[6] Heinrich Wölfflin, *Kunstgeschichtliche Grundbegriffe*, 248 as quoted in Arnold Hauser, *The Philosophy of Art History* (Evanston: Northwestern University Press, 1985), 128.

An appropriate professional stance gives practitioners the skill of detachment, the ability to note their responses as though they were someone else's. These responses must be taken seriously but must remain in our heads and not imputed to the object.[7] With all the discussions of meaning, aesthetics, use, and interpretation that enter into object analysis in the broad sense, the object is a physical thing first, and its physical existence is the conservator's first priority. Speculations about the artist's intent, for example, may be interesting and may ultimately bear on treatment decisions down the road, but speculation should not be a part of how we see the physical object. Conservators must learn to separate their own, and anyone else's, ideas from physical reality.

Observations from an examination are in a separate category from other types of information because other observers can confirm them. Conservators assessing the same object might disagree on a prediction of the object's behavior during treatment or the desirable post-treatment appearance. But observations made directly from the object should not be subject to differences of opinion unless someone is simply mistaken. In any setting where more than one person is involved in assessing the object, this is a clear articulation point in the decision-making process: "Does everyone agree on what we are seeing?" The decision-making process should not move ahead until agreement is reached.

## Drawing conclusions

Observations from an examination also have to be interpreted before the decision-making process can continue. Once the conservator starts to express observations in words, many of those words unavoidably represent conclusions.

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[7] One common example of this is referring to an object as "needing" some particular kind of treatment, as in "Well, it obviously needs cleaning."

For this reason, the dividing line between observations and conclusions is surprisingly difficult to pinpoint. Yet conclusions are subject to re-consideration when new information becomes available, so the distinction is an important one.

The correct identification and interpretation of observed phenomena require that conservators have an understanding of the chemical and physical processes linked to specific aspects of appearance. These are vital matters of both seeing and understanding. A few scattered published articles help to explain the phenomena of gloss, color saturation, and blanching, and other matters contributing to the appearance of objects,[8] and a few explain the phenomenon of "tide lines."[9] But, in general, conservators learn how to proceed from observations to conclusions through supervised experience.

Many of the words that conservators use in describing observations are, in reality, conclusions. It is, in fact, surprisingly

[8] Such articles include Eric F. Hansen, Rosa Lowinger, and Eileen Sadoff, "Consolidation of Porous Paint in a Vapor-Saturated Atmosphere: A Technique for Minimizing Changes in the Appearance of Powdering, Matte Paint," *JAIC* 32 (1993): 1–14; Robert L. Feller and Noel Kunz, "The Effect of Pigment Volume Concentration on the Lightness or Darkness of Porous Paints," in *AIC Preprints of Papers Presented at the Ninth Annual Meeting, Philadelphia, Pennsylvania, 27–31 May 1981* (Washington: The American Institute for Conservation of Historic and Artistic Works, 1981), 66–74; and Glenn Wharton, Susan Lansing Maish, and William S. Ginell, "A Comparative Study of Silver Cleaning Abrasives," *JAIC* 29 (1990): 13–32. The last-cited article offers a particularly well-integrated view of the chemical and physical phenomena associated with age and use of decorative arts silver and their effects on the appearance of the objects both new and used.

[9] U. Scheissl, "Konservierungstechnische beobachtungen zur festigung wassrig gebundener, kreidender malschichten auf holz," *Zeitschrift fur Kunsttechnologie und Konservierung* (1989): 293–320 as cited in Eric F. Hansen, Rosa Lowinger, and Eileen Sadoff, "Consolidation of Porous Paint in a Vapor-Saturated Atmosphere."; and J. K. Hutchins, "Water-Stained Cellulosics: A Literature Review," *JAIC* 22 (1983): 57–61.

difficult to describe visible phenomena in neutral terms, without implying causality or significance. Jumping to conclusions in this situation is so ingrained that it is almost impossible to keep our brains from "going there." The more experienced a conservator is and the larger the body of similar phenomena she carries in her head, the more readily her observations segue into conclusions, using expert knowledge almost automatically. This is sometimes called a "ladder of inference." It is a necessary tool of inquiry but can just as easily mislead. The ability to keep an open mind is as valuable as any other single analytical tool at the conservator's disposal; sometimes even a perfectly reasonable conclusion turns out to be wrong.

The difficulty and awkwardness of describing a phenomenon without drawing conclusions is illustrated in the following chart, which presents a selection of textural anomalies found on painted surfaces. The first column describes phenomena without (the author hopes) incorporating any conclusory or interpretive terminology. The second column gives the corresponding technical term in common use. The first set of descriptions is completely different from the terms in the second column, which most conservators would use as if they were direct and irrefutable observations.

| **Observed painted surface phenomenon** | **Likely explanation** |
|---|---|
| Series of parallel ridges usually longer than wide and oriented randomly in relation to the texture of the support | Brushstrokes |
| Linear phenomena with triangular cross-sections raised out of a flat field with a discontinuity at the apex and usually oriented parallel to the texture of the support | Surface layer separation ("tenting") |
| Raised areas <1 mm with spherical shape, same color as the paint | Pigment particles or paint impurities |

| Observed painted surface phenomenon | Likely explanation |
|---|---|
| Same, but black in color | Fly specks |
| Single conical areas of a paint surface on a textile with sides curved gradually out of the plane of the surface | Dents imposed from the reverse |
| Ovoid areas with a gently curved convex cross-section on a paint layer on a textile or paper support adhered to an additional support | Separations between the two supports |
| Round, slightly raised areas of different sizes often occurring in vertical linear series and of a light color | Drips of wax |
| Networks of linear raised areas which are the edges of concave subunits | Early stage of layer separation process |
| Random linear gold-colored areas, particularly those parallel to the edges of a painting frame | Rubs from rabbet or accidental gilding application |
| Series of variable-sized circles of a single color | Splatters of paint from a different source altogether |

Drawing conclusions is not automatic when the observed details are complex, but the process of using a variety of clues to arrive at a conclusion is something that conservators do routinely. Suppose an object has a painted surface with certain areas of a different texture than the rest. Usually, the subject matter or design will indicate whether the variation in texture serves a visual purpose that may have been intended by the artist. Examination under magnification or microscopic manipulation will help to determine if one layer overlaps another or if it lies in the same plane as its neighbors. Ultraviolet examination or solubility tests may help to determine if it is of a different medium or age. The presence or absence of cracks may establish which material is older and therefore, presumably, the "original."

The paint covering the larger surface area might be assumed to be the earlier one, but this is not always the case.

Because conclusions so quickly take on the aura of fact, alternative explanations must be identified and, if incorrect, rejected. At times, new information, further observation, or testing makes even the most solid conclusions look dubious. At that point, the list of rejected alternatives becomes useful again.

Like scientists, conservators should be trained to search for observations that contradict earlier tentative conclusions. Such training is necessary because humans naturally use newly acquired information to confirm existing beliefs rather than as a reason to question them.[10]

Replacing this innate tendency with its opposite – critical thinking – must be implanted by training and experience so that it becomes habit. The search for disconfirming evidence is particularly important in an activity like conservation examination that cannot include any normal scientific controls such as blind testing or replication by others. Following a methodology in this situation should not only help to root out errors, but also bolster conservators' confidence in their final conclusions.

Material identification is an example of observations sliding into conclusions, sometimes without explicit recognition of the shift. In most cases, material identification is so obvious that it seems like a direct observation. The automatic process of recognition of materials can be described as gestalt perception, a process acknowledged to produce correct results in a remarkably

[10] Massimo Piatelli-Palmarini, *Inevitable Illusions: How Mistakes of Reason Rule Our Minds* (New York: John Wiley & Sons, Inc., 1994), 123.

efficient way in a large majority of cases and entirely mistaken ones in the remaining few. Some material identification, like distinguishing among bone, elephant ivory, and synthetic ivory, requires directed attention, but others seem to require none. The question is whether the conservator is open-mindedly observant enough to notice the signs that an initial judgement may have been mistaken.

Experienced conservators are aware of specific opportunities for errors, such as mistaking an early plastic for ivory, cementitious material for certain types of stone, and photographs produced by certain processes for original prints or even paintings. It is best to make a habit of considering possible alternatives even though they can usually be eliminated easily.

Sometimes observed deterioration is unexpected. For example, a polychrome ceramic that suffers from flaking of the surface that looks like the crackle pattern of a drying oil film may be suspected of having been heavily overpainted. A painting on canvas that has the crackle pattern characteristic of a panel painting may be suspected of having been transferred. A small chip in the rim of a colored ceramic that reveals a white interior may indicate a repair.

An observation that may be inconsistent with a previous conclusion should be pursued, even if the conservator is not aware of any alternative explanations. Unfortunately, there is no standard list of possibilities to consult. Confronted with white crystals on the surface of an object, for example, a young conservator might conclude that they are soluble salts. There are, however, several other possibilities, including condensed paradichlorobenzene or other pesticides, crystallized forms of oils or waxes, incompletely removed resin, mold, or a miscellaneous accretion. The current conservation literature contains very few compilations of data of this kind.

**Words**

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## Words matter

Unambiguous terminology and precision in the use of words are important aspects of examination practice. In order to communicate observations and conclusions to others and allow comparison with other objects, there must be agreement on what words mean.

Conservators routinely identify observed phenomena with terms like "scratch," "stain," and "overpaint." These words are not simple observations. They incorporate conclusions based on judgements of randomness, intentionality, the timing of the occurrence in the life of the object, and the desirability of the phenomenon, as well as its precise physical nature. A "scratch," for example, generally refers to a linear surface phenomenon which is a loss, disruption, or compression of material. It is fairly uniform in depth and width. It has a random—or at least a non-meaningful—location and is not intentional or at least not in any manner related to the object's creation or legitimate use (i.e., it could be the result of vandalism). Surface features similar to scratches but intentional, non-random, and part of the object as created might be referred to as an engraved design.

Based on the above definition, the term "scratch" could apply to an entirely different phenomenon—the patina of old silver tableware. This consists of an overall pattern of small randomly oriented scratches that scatter the light and produce what many people consider to be a softer and more appealing gloss than that of polished new silver. Even though an old piece of silver is indeed scratched in the literal sense, the implication of the term to describe used silverware would not be accurate, and its use would be misleading.

Certain terminology implies the role that a phenomenon played in the history of the object. It may be part of the work as originally created or a consequence of original use. It may be damage

or deterioration. "Damage" refers to the undesirable effects of one or more incidents, either intentional or unintentional, while "deterioration" refers to unintentional and undesirable changes in state which are part of an ongoing process. Words like these contribute to the overall picture of the object, its history, and meaning and will lead to judgements about whether the observed phenomena should be preserved or "corrected" during conservation treatment.

Observations shift to conclusions in several steps. First, an observation is made, preferably with as little interpretation as possible, for example, "There is a parallel series of linear discontinuities in a silk textile." (This assumes, of course, that the conservator "knows" that the textile is silk and not a synthetic that looks like silk.) The conservator next identifies the phenomenon as the result of a form of deterioration typical of certain weighted silks. This conclusion is based on the conservator's understanding that the discontinuities are the consequence of gradual embrittlement of the silk threads, due to chemical changes in the fibers, the cells, and, ultimately, the molecules that make up the textile. The conservator will probably be certain enough of this conclusion that the possibility of a discontinuity being a decorative motif, sign of use, or vandalism will be rejected out of hand. The next step is to give the discontinuities a name: slits, rips, cracks, breaks? The best would be whatever term conservators routinely use.

Clarity requires that words representing conclusions be carefully chosen, with all their implications considered explicitly.

## An observed examination

The following was observed by the author at a session of the AIC Annual Meeting. It was not a full or formal examination, but illustrates some of the ways that an examination proceeds.

Conservation educator Jonathan Thornton[11] was handed a white plaque several inches in diameter, carved in low relief and backed with a gold-colored mounting. The object had been recently purchased by a conservation student who wanted to know "what it was." In the half-dark, Professor Thornton held it between his fingers, looked at its edges, and then gave it back to the student, but not before handing it to someone who was wearing eyeglasses in order to learn if there was a maker's mark on the metal mount.

Curious about what had happened, I questioned Professor Thornton later. Describing what he had done first, he said he was "getting a feel for what I think it is." He noted the object's weight as soon as he held it; he felt that it weighed more than elephant ivory would—a judgement made despite the presence of the metal mount. He then rubbed the white part between his fingers to see how it held the heat from his hands and looked at the edges for the so-called engine-turnings of real ivory.

There were indeed marks on the metal mount: "Italy" and a maker's mark. With that additional information, Professor Thornton was ready to announce that the object was a "typical cameo setting" of a material, not elephant ivory, which was exactly what he had suspected at the outset.

As a teacher, Professor Thornton has spent a great deal of time thinking about the examination process and shared several interesting observations. One was that if a student asks him questions while he is first looking at an object, he is unable to respond right away. This confirms the idea that the early stage of examination, "just looking," is a sub-verbal process. Another confirmation is

[11] Professor of Object Conservation, The Art Conservation Department, Buffalo State College.

that Professor Thornton initially described the way the object held the heat from his hands and his search for typical ivory grain markings. Only later in the discussion did he substitute the technical terminology—*R*-values and Schrager lines.

Professor Thornton said that students sometimes have a hard time seeing details like Schrager lines, but that naming them seems to give the students the ability to see them more easily. When asked if naming involves drawing a conclusion, he admitted that it is a tentative conclusion, still subject to change based on additional information. Some celluloid ivory substitutes have grain lines; calling them Schrager lines and concluding that the material is real ivory would be a mistake.

To what degree did Professor Thornton's years of experience contribute to the examination process? He explained that he carries in his head detailed information on the geographical and historical distribution of object types and material use. Most of that information, he said, was acquired from looking at objects rather than from books. Japanese *netsuke,* for example, are made from all kinds of ivory-like materials. In other places, only elephant ivory was used for carving. In still other places, carved objects were made only from cheap imitations. The "Italy" marking on the metal mount served to confirm his early suspicions, based on the feel of the object as well as his knowledge of European practice, that it was not ivory.

For experienced conservators like Jonathan Thornton, examination begins with a finite number of choices. When the conclusions from examination conform to the conservator's knowledge of material culture, as they did in this instance, the examiner can be confident of the conclusion reached. If they do not, the whole examination—observations as well as conclusions—must be reconsidered, and additional information may be needed.

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The examination process consists of a period of free-ranging observation, followed by a more focused consideration of certain selected phenomena. Based on the knowledge and experience of the conservator, observations lead to tentative conclusions expressed in words. The conclusions are then tested by a search for disconfirming evidence and by testing of alternative explanations supplied from the body of knowledge in the conservator's head. As necessary, new hypotheses are proposed which are in turn subjected to testing by further observations.

The overall time required for this process can be quite short. Yet if any steps are ignored or if the conclusions are mistaken, treatment decision-making can be compromised. Inaccurate conclusions drawn during an examination can irreparably taint the treatment process.