

**Speaker1:** Okay, given the time constraints, I think we have to move seamlessly onto the next group, which is what we continue to call Work Group B, which stands for Scientific and Technological Research, but we'll see how we've answered the brief as it were and what suggestions we've come up with. The work group on -- this particular work group, like the other AIA work groups, grew largely out of a core set of members who attended the hay ground table meeting in 2012 with some later augmentation. Although a small group, we nonetheless manage to encompass the perspectives the scientists, technical art historians, conservators, not historians.

We're also mainly institution-based, although several of us are in private practice. And to encourage discussion, we circulated a questionnaire covering a wide range of topics around the subject of technical art history and material studies, whichever you want to call it, art science. It's relevant some practice in relation to authenticity, and I will try and summarize the various responses we got shortly. In addition to this group being -- a number of us were also recently involved in a separate one-day seminar held at Oxford University on Standards and Practice, really more broadly in the technical art history/art science areas, and this is already been alluded to that it was in the context of Russian avant-garde art research.

But they consisted of a series of expert panels, an audience of equivalent professions with long experience in their various fields. So while the Oxford seminar was in part arranged, look at issues connected to Russian avant-garde art, to where the panel's dealt more specifically with current scientific and technical art history practice. So I want to weave some of the discussions that came out of that into the results that we're about to present. Essentially, because it's a broader field than just authenticity and authentication, and we have to respect that.

Overall views on topics seem to vary from the largely indifferent to the strongly held. So some areas evoke little response while others were clearly more enthusiastically contentious. It's also very apparent that forums such as these are deeply needed. One of the points of specific and highly positive feedback we got in Oxford, was that it was eye-opening; that colleagues have been operating in one area, knew little of what others in ally disciplines knew or thought about these issues.

I'd also, just to add one further comment before we proceed, that while we're talking about authenticity, the larger field is concerned with wider questions relating to material study of art. So practitioners are commonly in the main working on technical art history rather than authenticity per se. Consequently, there's a wider movement towards field professionalization within which authentication practices need to be framed. This, of course, also means that it'll probably be the wider field that ultimately sets the agenda, if as a sub-community we're pushing it forward and making sure our needs are met.

These are basically people who are involved in the various exercises. So Julie and myself, we were involved in both AIA and the Oxford seminar; the work group members from AIA and also people who sat on panels at Oxford.

I'm afraid you're going to have to double-read or you're going to have to read and listen to me, because I don't want to give you all the questions and all the answers; so you have to bear with me. The desire, basically, of having a unified set of guidelines for practice was largely supported. By the way, this is the kind of the feedback from people; it's not necessarily my personal view. Some of my personal view is fed into it, but it's essentially from that group of practitioners, the kinds of responses we were getting back. I formulated the questionnaire by and large, but there seemed to be a feeling that it did cover the various issues.

So the desirability of having a unified set of guidelines for practice was largely supported, although it was nonetheless acknowledged that the nature of the field and the kinds of questions we're faced with, are so varied, this could be difficult in practice to achieve. For example, some thought it essential to have such codes, while others thought it's likely to prove impractical. It was also suggested that specific areas such as reports to clients could be more controlled, given the evident problems in this area this might be something to focus on sooner rather than later, and I think we're going to get some recommendations on reports and so on later.

I also don't know if it was because the group was particularly Euro-centric, although people didn't feel they comprised a relevant set of guidelines, but nobody mentioned either the Americanist conservation codes, although it's at the College Art Association. Neither though with the efforts of the EU CHARISMA Network brought up. Though these explicitly connects with inter-laboratory standards and practice. On the other hand, several books on conservation practice were mentioned and eco guidelines, as well as using examples of good practice as an exemplified in papers published in leading professional journals.

What this seems to underline though, is that there is a practical absence of recognized appropriate and respected guidelines, and that these do need to be formulated. So if there's a proposal, there's one. At the same time, there was normally an internal methodology that had been developed by specific institutions, this being used at least as a guideline in daily practice. One way forward might be to collate these or to ask contributors to formalize what they do already in an outlined document that can be shared and used to develop such a broader framework.

There's also a sense that conservatists already had more specific frameworks for conservation, perhaps because the formal scientific analysis tended to be as a service in response to specific technical questions rather than broader systematic studies. Other things mentioned included ensuring more explicit statements of the purpose and scope of any study, as well as a need for training of specialists in how to specifically approach examinations for authenticity studies.

Oh dear, we're back to terminology. It was widely felt that this use of common language needed to be addressed, if only to ensure that we were all using terminology in a consistent manner. At the same time, people were in no doubt that development of such common terminologies was an enormous and daunting task. Terminology development

is well-recognized to be complex, especially when supporting multiple languages as we've just heard, but the need for precision in terms was nonetheless thought to be highly important. One comment to add, for example, they felt there was quite inconsistent use of terms, and I know for myself for instance with pigment terms, that use is extremely lax, such as commonly using chalk to refer to all sorts of different forms for calcium carbonate.

Use of language has strong implications, and we need to be articulate and accurate when communicating. At the same time, there are also interesting comments regarding the use of clear language for non-specialists, along with an evident concern for how we ensure the requisite balance of clarity and accuracy. It was universally agreed in the group that it's fully reasonable to charge for work undertaken, which was a relief to me I must say, that this reflected a reality of how to pay for this kind of work when there are costly resources involved in being able to undertake technical examinations. It was also universally agreed that this should be on explicit basis of time and cost, that is that the charges should relate to the formic amount of work undertaken and in no way to value of the object or how to come at the study.

On a slight different point, the question of non-invasive study also elicited a lot of comment. Essentially, the feeling seemed to be that physical samples was at least currently a necessity to some degree. At the same time, there's a clear view that this should take place only after a proper process of examination and documentation; possibly but not necessarily including non-invasive forms of analysis, and that would include imaging techniques like Infrared and X-ray, also perhaps preliminary analysis by things like X-ray fluorescence.

It was though, widely implied that authenticity studies required greater depths of analysis than purely non-invasive approaches is currently available. Finally, on another facet of this particular topic, on skill level, respondents mentioned the interdisciplinary nature of authenticity studies. While also underlining the need for adequate and appropriate training relating to authenticity. For example, evidence of a rigorous academic training was specifically mentioned as a way of ensuring critical ability.

On the topic of establishing minimum stands, one respondent stated, "A professional with ambitions to offer authentication services, but no access to facilities and information should simply reconsider his or her plans." Minimum resources described by respondents related, of course, to specialism. Conservators particularly emphasized imaging techniques and surface microscopy, practices in scientists include these, but also listed a number of standard analytical tools such as X-ray fluorescence, electron microscopy, **[unintelligible 00:10:11]**, FTI or gas chromatography.

There was enthusiastic support for collaboration and the benefits it brings, including the sharing of facilities and information within the professional peer group. All of us, I think, are already involved in such sharing structures, and people seemed very positive about extending this, such as by organizing more systematic networking on a broader expert platform, and I think this is something we'll come back to when we can get to professionalization.

On good practice, respondents listed a number of features they would expect in a good study, including such points as definition of the question, including examination of the historical context and a stylistic assessment; a sound articulated strategy, a description that the methods used; examination of condition; examination of technique; accurate documentation; clear knowledge of the current state of research in the field, and multiple approaches to confirm analytical findings.

Conversely, concern was also expressed about work where flawed arguments, baseless assumptions, inadequate documentation, and poor use of terminology was present. It sounded a bit like personal experience. It would seem possible from these responsibilities, to at least in principle draw up a standard format, even if in specific circumstances such as a very limited study, this was departed from. That is, we can develop a kind of checklist of what ought to be included. And perhaps this is a further kind of recommendation.

Probably unsurprisingly, there was universal support for close interdisciplinary working, although the range of views were expressed on how this works in practice. For example, while one respondent might emphasize collaboration and inter-field discussions, another might suggest that it was dependent on the particular situation, or that reports ought to be prepared separately, so there's quite a diverse range of responses on this point.

One particularly insightful comment, though, was that while full cross-disciplinary expertise sounded ideal, no other sector works this way. We have only to think of examples in medicine or architecture and engineering. These fields have seemingly evolved ways of effectively working cross-specialism, so perhaps we can too. Views on whether cross-disciplinary work currently functions well probably depends on personal experience again, though examples of good practice included things like Rembrandt Research Product and another Dutch initiatives, to which I should add other countries are available.

There was also an interesting set of responses to the question on the boundaries between conservation and technical art history. These fields were clearly felt to be distinct, mainly because the focus of conservation is treatment and preventing care rather than material study for other purposes.

On the context of work, broadly, the feeling was that work should only been undertaken by a group with sufficient resources in terms of relevant expertise and equipment. As one respondent said, the context is inter-disciplinarity; any single individual is unlikely to be able to evaluate all evidence without discussion. Another added, single specialists will have serious problems to provide the necessary infrastructure. Probably units of minimum three to four people combining the necessary expertise in different fields seems reasonable. Obviously, this will have an impact on current practices in commercial provision for authenticity studies, since much is done by individuals of very small groups without a broad range of skills.

On the topic of instrumentation, comment is mentioned a range of standard analytical techniques covering imaging of sample characterization, much as I've already mentioned.

Not all participants had such facilities in the house, but the implication appears to be that such resources should be found as part of good practice.

On the subject of what constituted sufficient expertise, general indication was that there should be a clear demonstration of research and evaluation skills through appropriate high-level academic qualifications, and an evident knowledge of the current state of international research in the field. It's probably reflective of the current state of the field. There was no specific recommendation though on training, although one might expect conservation to be done by conservators, chemistry by chemists and so forth.

However, the collective view appeared to be that a) personal expertise should be at a high level, and b) that complementary expertise was necessary and should come through collaborative working. Prior experience in dealing with authenticity problems is also mentioned, presumably because of the specific kinds of issues raised, and that prior experience was highly relevant.

On the topic of reports, respondents were fairly definitive over what they felt should be included in reports, though the precise form in some instances varied amongst the group. For example, there was universal support in the replies for clear statement of argument, as one answer put it, a research question should be formulated in lucid prose, and a brief explanation of the chosen technical method and the reasons why. The specific analytical protocols followed was also felt to be essential to include, along with an indication of the possibilities and limitations of the chosen methods.

On the other hand, while analytical results were also considered a proper part of the reporting, how comprehensive this should be differed amongst the group, from complete disclosure to making them available only on request. A common practice would seem to be a middle path providing sufficient detail to make the further interpretation meaningful, while stopping short of including instrument data files or spectra. Nonetheless, it was quite clear that there was an expectation of all data being fully available as if when necessary.

Most of the group also clearly felt that sources consulted comparative data and so forth, should be fully cited; the single hold-out, is argued, though that an expert report for an auction house or private owner in there does not have to fulfill standards of a scientific report. However, this perhaps goes to the heart of the debate on science versus authority, unless an independent peer assessment can be made, one has to rely solely on the professional standing of the report author.

Lastly, one answer addressed the specific issues surrounding final conclusions, stating that this should be sensible and must be as brief and clear as possible, trying to express a degree of certainty bears the strong risk of being misused or misinterpreted. Often, scientific reports tend to be too positivistic without making the limitations of scientific expertise unmistakably clear. There is, undoubtedly, wide variation in how people currently express so many comments, and this should probably be a topic for specific professional recommendations going forward, since it evidently leads to so much misunderstanding.

There was general support for as much openness as possible, though individuals drew the line differently on what constituted such limits. For example, fakes was seen by some as uninteresting and not worth sharing, while others felt they were a legitimate field of study in their own right. Peer review was not surprisingly viewed as highly important, though the group did not indicate just how this should be achieved. Clearly, there's a range running from wholly private reports written by a single author, through to extensive research projects carried out entirely under the public gaze. However, it would seem reasonable to aim at a minimum for somewhere in the middle where work is checked in some way but someone other than the original author, mechanisms for this though are currently unclear.

One of the corresponding risks of open information, one respondent further commented, the idea of a forgers charter is rather like protecting military secrets, knowledge is always evolving anyway, and what one group can do at a given period could be done by many other groups very soon after. So critical knowledge does not remain critical over time anyway. And to the final topic, professionalization. It was very clearly expressed, both through the responses to the questionnaire and within the Oxford seminar discussions, that there's a desire for some form of professional group. Whether this consists of a formally constituted body, or simply as a professional network was more open, with the respondents' views raging from only wanting a networking forum, to those who thought a full-scale body was needed.

What does come through though, is that there ought to at least be a structure through which colleagues in this field can exchange knowledge, even if this falls short of a full-professional body with all its attended problems. One comment also pointed out difficulties with transnational legal codes, for example. They're presumably, if these are any guidelines with no force of law, then that would be less of a problem, if leaving them somewhat toothless. With that, I think if we could -- hopefully, we have time for a brief panel, if the panel can come up?

**[pause]**

It's a little bit mix and match, okay? So those on one work group may be in others – Gunther. [laughs] It says on the program, that we should have **[unintelligible 00:20:38]** from Dunne Institute here. Unfortunately, she couldn't make it. Gunther has very kindly and generously stepped up to the block to fill her shoes. Given the shortage of time, I think I probably just want to pick up on a couple of the areas. The first one, I think perhaps, to try and get some thoughts out about minimum standards, and standards of proof -- and what the various panel members might feel about that Gunther, you're on this end, I'm going to ask you to start. If you've got some personal thoughts on minimum standards, and how we might tackle those kinds of questions? Bluntly, who should be doing this kind of work, and who shouldn't?

**Gunther:** Challenging question. Of course, we are thinking first of all standards with analytical devices, reference standards of using all the same standards when we analyze paints for example, pigments, and what does that mean for -- I just remember that two

years ago, there was a project Pop-Art, where they had sent the same samples of plastics to a wide range of laboratories in Europe and tried to find out whether they were all identified at the same material, and it showed that there are differences even when they are using the same equipment. So we usually tend to understand the hard science in the way that they provide us really the facts which cannot be questioned, but it turns out that it not always true, so standards in these analytical procedures would be elemental and rely on the exchange of information or of standard references.

The other aspect that brings to my mind, in that respect is the standards in terms of how we are using certain analytical techniques like imaging techniques, infrared reflectography for example -- what the possibilities and limitations of this technique -- can we identify materials, can we identify material groups? What can we say on the drawing style, that is disclosed, or can it, in some cases, even disclose signature of another artist underneath as it can be the case. And so, in that case, the underdrawings provides a different fact than if there is on the comparative stylistic analysis used with it.

So I think first, when I'm thinking of the question, what would be possible on the near future, I would aim to describe these analytical methods, these imaging methods, more clearly within the limitations and possibilities to give it as a better understanding of the context of that information.

**Speaker1:** Okay, Daniella?

**Daniella:** Going on with your comment, this would be very useful to assess when – take -- when the taking of microfragments and microsamples is important. So to define the relationship between these non-invasive technique and the micro-invasive technique is absolutely very, very important, because I noticed that there is some confusion in this issue, and I think that it is really very important. And the other point could be what, having a sample, you can do of this sample? What kind of analysis, and what kind of results you can get from this sample?

**Speaker1:** Thanks. Eddy, can we get the art historian's perspective?

**Eddy:** Yes, well, the art historian has for 12 years worked for an international dealership. In those years, we were offered artworks by supposedly big names that were often accompanied by technical reports compiled by laboratories. These reports connected fairly bold claims to the results of the technical analysis, which were not justified. And this makes me bring up, again, the need for some kind of branch organization to show the audience at large that if you are confronted with a laboratory, either as a commissioner of a technical research or you're faced as a different party with a technical report, that you can then see if this laboratory that produced such a report is a member of such an organization, and it would be a very useful tool to eliminate the bad practices, because we are talking now about improving standards that are already quite high. But there are also a lot of bad practices around that we should take care of.

**Speaker1:** Yes, that's a point we're going to come with professionalization and how do we actually, in practice, ensure that there is good practice? Julie, have you got a short comment?

**Julie:** Yes, I guess I'd choose to address the institution market problem, because we talk about the goals we need to set; what are we trying to do with any given analysis, and it's very important to remember the problem of limiting means. A museum investigating, for example, the impressionist project that Iris was involved with, you have a certain aim to try and study objects in a way that complements its art technological that will expand the art historical knowledge and allow that to be built upon in a very specific way, often in museum practice.

I was an intern at the National Gallery in London during my training, and we were very much concentrated on taking cross-sections and studying stratigraphy. It's a very, very different set of constraints you work with when you work with a private laboratory, as you have a customer who has a budget, who has a need that they need to accomplish by the scientific analysis of the work of art, and the way that resources are focused have to be very carefully tailored so it best serves the limited budget and the limited needs.

So in a way, perhaps that the focus could be defined as a way to encourage solid minimum practice for specific goal-oriented aims in trying to find salient points for attribution with a private laboratory or in a museum context. Obviously, the museum will have more resources or trying to focus scientific aims when you have someone coming in with the work they believe might be forgery, how to best, most-quickly, most cost-effectively define the problem and with the means end.

**Speaker1:** Yes. Iris, perhaps you'd like to give us the institutional perspective on that?

**Iris:** Yes. Sorry, I can talk about -- I strongly feel we need standards, I can talk about our recent research project we have had, the [unintelligible 00:29:20] in Cologne, together with the [unintelligible 00:29:24] in Munich, and in this research project which the focus was on the technology of late medieval Cologne palette paintings, we had to set standards before we started our research, otherwise we couldn't guarantee the quantity and quality of our research which we had to compare in order to come to findings.

So I strongly feel that we need standards, not only for technological research, but also for art science as a whole.

**Speaker1:** Then perhaps we'll wrap up the panel comments by just touching briefly on professionalization? As I said in my introduction, that does seem to be some kind of groundswell towards setting up professional networks, professional bodies. Perhaps I could ask each of you what your perspective is very briefly on that topic, and perhaps we can then take one or two questions. Gunther, you're on this end, you have to start. If you want to pass it to somebody else, do.

**Gunther:** What brings to my mind is the discussion about who contributes what, and how is it contextualized. I think, from my experience, it is desirable when you talk about guide for good practice, that the information as generated by scientists, either art technology scientists or cultural heritage technology scientist, and conservators or art technology are brought together and question each other. So instead of just leaving it to one side on its own, I think that in the visual experience and all of the information that conservators are told, or learn, and in their training should be -- it was a good starting point to prefer the professionalized towards the technical art history. I think that's something to bear in mind when considering also that short course could supply, provide a technical art history, and I have a few doubts to which extent or what is -- yes, put some perspective on that.

**Speaker1:** But if we had a broad-based framework, that's many from different allied disciplines could contribute to. Daniella?

**Daniella:** A little bit difficult, because usually, a relationship between art historians and art scientists is absolutely very, very useful. But practically, it is not so easy to get this collaboration, because sometimes the languages are different. Sometimes, art historians do not trust the scientific results. On the other hand, sometimes there are a lot of scientific results, and they could have been in an absolutely -- there could have been a few, than this large amount of results. And so, they are difficult to interpret, either by the scientists.

So the goal is sharing of languages and of knowledge, and I hope that in the future--

**Speaker1:** That we can achieve that kind of fusion with wider networks?

**Daniella:** Yes.

**Speaker1:** Okay, Eddy, would you join the professional organization of technical art historians?

**Eddy:** Yes, if this organization moves regularly organized conferences, I would certainly be present. And I don't know if these organizations are already there, but maybe we can make them better-known under the community of the average art historian, the normal art historians that don't come into contact with art scientists on a daily basis. So maybe the community of art scientists and conservational scientists maybe should reach out to the larger art historical community through other ways, maybe through universities where their object-orientated approach is often lacking, so that may be very general a suggestion.

**Speaker1:** But it's these facets of a professional infrastructure, isn't it, that you have conferences to go with the professional body and so on? Julie, I think you might have some interesting comments to do with your experience with the Art Technological Source Research grouping, where it would set up for one purpose but it seems to be that you've had a lot of people wanting to come along, presenting essentially technical art history kinds of papers.

**Julie:** Yes. I think one of the problems that we've had with this slightly, is that we need both more understanding and more interaction. The technical art ATSR -- Art Technological Source Research working group -- was set up within ICOM-CC, the conservation council. So the problem is, is that generally then our attendees tend to be drawn from this particular branch, and we try to drag art historians we know who are interested to come along, but it's a bit tricky.

They're a bit resistant, and on the other side we have an opposite problem which our colleagues from the art science field, who are working with texts in a way that is not interrogating them, just using translations, not looking at the original text, not looking for problems or difficulties in the translations that have been made -- often hundreds of years ago -- Merrifield and Eastlake for example -- mid-19th century, [unintelligible 00:37:07] Chenini, early 20th century.

These things are what we're working on, trying to bring up today and revise and understand more profoundly. And often, we have a disinterest on the side of art historians and a misunderstanding on the side of some of our scientific counterparts who feel that, by taking the old Merrifield and Eastlake for example, and trying to have a scientific experiment around one of their recipes, this is what they understand as source research, which is a particular branch of art technological research.

And I think one of the possible benefits of having a more defined professional network, is perhaps as a professional group, we might reach out to one another and try and produce interactions, meetings, conferences where the methods of interactions and the goals of the interactions are more clearly defined. So that we would try to stay away from overly heavily scientific information that might confuse our colleagues on the one side to try and present that in a digested form, and to try and achieve a sensible integration, because the ghettoization of our different academic disciplines is something that I feel has been a bit of a difficult issue in my personal experience.

**Speaker1:** Iris, just to last comment?

**Iris:** Yes. I agree a little bit. Gunther, as I see, technical art history as an interdisciplinary art, it needs to have an interdisciplinary approach, sure. And in regard to paintings and authentication of paintings, I think the conservator has basic skills to start with technical art history or technical research. And the field of the scientists of traditional art history -- they should come together.

**Speaker1:** I think as you expressed it to me, you had an extremely good point that conservation gives you a very strong grounding in the material object, and it's part of a training process, and that it's historically been how it's been. I may have done physics first, but I then went and did conservation. That gave me insight into the object itself. And that for authentication particularly as this subgroup, that it was then a powerful combination. Perhaps we can manage two questions? I think we're all desperate for lunch, but--

**Michael:** What I wonder, and [unintelligible 00:40:02] you are also a painting conservator just as I am, and we're trained as painting conservators. There are more painting conservators. And suddenly, when we turn to the topic of authentication, then you become -- you need a title or training? So my question is, what are we doing with the person, the conservator, the restorer, sitting in front of a painting, sometimes months, years, knowing so much about also the technique of a painter? How we shift that in your schedule? You understand what I'm -- Iris, you are a practical, active painting conservator, how you see this shift to technical art history? Because I think it becomes all very theoretical then. We don't have people -- again -- the active painting conservator is shift out.

**Iris:** No, I don't believe that.

**Michael:** Maybe it's my perception, but maybe you can help me there.

**Iris:** Thank you, Michael. I think not everybody in conservation should have the specialization in technical art research. It could be, but it must not be. So not every painting conservator should get a special interest in this field. That's my opinion to that.

**Julie:** And sudden jobs would require more of one skill more of another, that's exactly what we were trying to say, that it's in no way a negative comment on the worth and the knowledge of the conservator; it's just recognizing one of the many skill sets that a conservator may possess, but also that it's a distinct skill set, but isn't necessarily highly developed after normal conservation training, that merits something like Jürgen's program in technical art history, that merits understanding the art historical approaches and the questioning thinking to documents that change over time and meanings of words, and interpretation and foreign languages.

A lot of conservators -- I went to New York University where we were required to read in foreign languages, many conservators have limits on their ability to do technical art history, that are simply language-based. There's a skill set that makes you more or less apt in doing technical art history. So it's in no way to say that the conservator is pushed out. It's saying that conservators have different strengths and weaknesses just like everyone else does.

**Michael:** But then, we have the same situations, of course, with the art historians. You can say exactly the same there.

**Julie:** Yes, no problem.

**Speaker1:** Okay, we need to wrap up pretty quickly. Can we take another question from somewhere else in the audience? Somebody burning to say something?

**Speaker2:** Yes, I'm just listening to this thing that's recurring about language, and I went to design school in Italy, and the foundation of our basis even though we didn't understand language, was a color-coded system called Pantone, which transcended to everybody in

all countries. It was a number which everybody universally understands, and a color. So I just wanted to put that thought out there, is that maybe our new language for the future is some kind of universal number and color-coding system that we come up, and everybody internationally can understand even though they may not speak Chinese or Italian, but the number five translates to Japan, to the United States, to Germany, to Italy. So just this thought of what may be a very simplified universal language between us, it's there. So let's put that thought into place. [laughs] The Pantone system is already universally recognized.

**Speaker1:** So there's already something down here saying "No."

**Speaker2:** [unintelligible 00:44:31] doesn't work.

[laughter]

**Speaker1:** I think it's the sheer complexity. There are a number of standard terminologies on different things. How do you describe a textile, and the kinds of standard ways that -- yes, these things do exist. It's not terribly coherent, but part of a professionalization process ought to be able to absorb those many disparate standards. Iris, if I could just ask you for one final comment to do with your impressionist work and the kinds of the standard formats that you were producing to try and overcome some of these kinds of issues?

**Iris:** In regard to standards?

**Speaker1:** Yes.

**Iris:** The same as I already said, we had to set standards before we do investigation of nearly 70 paintings, otherwise I think it's hard to manage, to compare, the results and to come to best quality results. So you might see that -- when you see our -- we did an online publication, maybe somebody knows it, about the findings of our research, and I got in contact with [unintelligible 00:45:55] after. In recent times, they've published only showed examination reports, which based on much more information we gained, but we had to put the most exciting results together than most important results, and that couldn't be possible if we have had before standards in many different aspects of our investigations as well.

**Speaker1:** Yes, and it then becomes how we propagate that good practice to the wider community. People see the work you've done, hugely admirable work, and I think people are wanting to take it up and through framework structures as we can start to share those initiatives much more widely within the community. Okay, I think that's it. Oh, this one desperate speaker--

**Speaker 3:** Well, not too desperate, but I think we can learn a lot from medical science. Doctors have a lot of different levels of specialization, they still call themselves doctors. There's good doctors and bad doctors as well [laughs], but I think if you talk about a

physicist or a chemist, they have a very specific, sort of basic knowledge about that field, and if they wander into the art community, they will learn many more things, so that then becomes a specialization. But you cannot do without a strong physics or a strong chemical base, because you're not going to understand what's going on. So that is really, to my feeling, a basic requirement.

**Speaker1:** I think there was something that came out of the questionnaire that people weren't overly concerned which precise specialism, but there had to be an underlying strong academic training, yes.

**Iris:** Actually, if you look at the list on the Conservation DistList, I survey recently on all the job interview and the job requirements for conservation scientists, it was -- over the last 20 years, I went back -- I went back as far as it went. It's a discussion list for conservators, and conservation professionals and includes job descriptions. And most of them required as a minimum, a degree in the hard sciences of some sort to work as a conservation scientist. Many included Masters or PhD as well, so I think that judging by that, it's an accepted standard in the field already, although it's not actually articulated somewhere. It's what people are looking for when they're hiring in that particular profession.

**Speaker1:** Okay, thank you very much.

**[applause]**