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CURATOR'S INTERVIEW

Geert van der Snickt Interviewed by Vanessa Paumen

This eZine, which is wholly dedicated to material and technical research, would not be complete without Dr. Geert van der Snickt's report on Macro XRF scanning. Geert, a cultural heritage scientist at the University of Antwerp, recently acquired a professorship sponsored by the Inbev-Baillet Latour (IBL) fund.

Dr. Van der Snickt was interviewed at the Groeningemuseum in Bruges, where he was scanning one of the highlights of the museum's collection. For the occasion, Jan van Eyck's *Madonna with Canon Joris van der Paele* was in the depot, standing on an easel, without its usual protective glass – a rare sight even for the staff members of the Groeningemuseum.

Geert, how nice to meet you in our museum, working on one of our most treasured pieces no less. How would you describe your current work at the Groeningemuseum?

I've come here at the behest of the Belspo VERONA project, set up jointly by Bart Fransen and the Royal Institute for Cultural Heritage (KIKIRPA), which is currently using assorted imaging techniques to make a systematic study of the undisputed paintings by Van Eyck that are to be found in Europe. To this end, the Royal Institute for Cultural Heritage (KIKIRPA) is applying all the traditional imaging techniques, including digital photography, infrared

reflectography and X-radiography, as well as the latest development: MA-XRF scanning.

MA-XRF stands for Macro X-Ray Fluorescence. What is that exactly?

MA-XRF scanning is an analytical imaging technique, whereby the visual aspect of traditional imaging techniques is accompanied by chemical analyses. The added value of this technique lies in the fact that a great deal of surface area can be analyzed, after which the results are converted into visual images that can easily be interpreted by art historians, restorers and cultural heritage scientists. You don't necessarily have to have studied chemistry to begin analyzing the data, whereas that was previously the casewith pure chemical analyses. Instead of producing graphs and spectrums that are difficult to interpret, scanning produces a legible image.

How does this work in practice?

The machine scans the surface of the painting and takes measurements. This data is then converted by specially designed software into an image that somewhat resembles the image of an X-radiograph. Like X-radiography, Macro XRF scanning works with X-rays that penetrate the paint layer, but the big difference is that it produces not one image but a series of images, each of which shows the distribution over the surface of the painting of a specific element (e.g. lead, silver, iron, copper, etc.). Macro XRF scanning also differs from normal X-radiography in that XRF detects radiation in reflection and not in transmission. In X-radiography, the X-rays penetrate all the layers and materials of a painting, so that both the front and back of the panel – and the wood and nails too, for example – are reproduced in a single image. Macro XRF, on the other hand, is applied much more selectively, and only the uppermost millimeters of the painting's surface are scanned, i.e. only the paint and priming layers.

Just now I've set up the scanner to scan a surface area measuring 50 by 50 centimeters, which will take approximately twenty-four hours. It takes a long time because the scanner makes measurements constantly, rather than simply recording a single image.

Interpreting the images is done together with the art historians, and this collaborative element is the big advantage of this technique. Previously the chemist sent the "dry" results of chemical analysis to the museum staff and that was that, whereas now there is much more interaction and the results are discussed together. We give the images to researchers, but we ask to be mentioned as co-authors of their publications.

You also do another kind of research, namely synchrotron radiation-based analysis. Would you mind telling us what this is?

A synchrotron facility is a particle accelerator that generates intense radiation with specific characteristics by bending the path of accelerated electrons. This technique is used primarily to examine degraded material, such as discolored pigments, to explain complex chemical changes in the paint layers.

Often the point is to study one very specific process, such as the discoloration of vermilion, which was the subject of a colleague's doctoral dissertation last year. Recently, another colleague published an article on the degradation of Van Gogh's red lead, and in my own dissertation I explained the change in cadmium yellow.

Can you also determine when the discoloration took place?

No, not exactly. In paint cross-sections, you can see that the discolored layer is often only a thousandth of a millimeter thick, and yet a painting can look completely different owing to the optical effect created by such a thin layer.

The only way to analyze this affected layer selectively – separate from the rest of the underlying, unimpaired paint – is with submicron synchrotron beams. Our research using Macro XRF scanning has its origins in the particle accelerator as well. We scanned the very first painting with synchrotron radiation because it creates optimal conditions for measurement. That experiment was so successful that we asked my colleague Matthias Alfeld to build a handheld device that could be used to make approximately the same kind of scans as those made in a synchrotron. We didn't know beforehand if it would be possible, but, amazingly enough, he succeeded in making a mobile XRF scanner.

And that is the instrument you now use in museums. How do you handle museums' requests to come and scan their paintings?

There is indeed a great demand for such scans. The instrument has meanwhile been commercialized and put on the market by a German firm that specializes in XRF equipment. The scanner is still rather expensive, however, and you need a scientist who knows how to use it. A large museum with a scientific department can buy such an instrument. The Metropolitan Museum has just ordered a scanner and the National Gallery in Washington, D.C. is building its own. So there are more and more scanners around, but there is still great demand for ours. When our instrument was still being developed, we usually examined only the most interesting cases. Now we work more systematically by scanning, for instance, the work of specific artists.

We are currently collaborating on the Dutch NWO project on the late Rembrandt. I personally have a strong interest in Memling, so I have undertaken a systematic analysis of his works, including the *Moreel Triptych* here in Bruges.

Are the results available to the public? In other words, is there a portal where the scans can be seen?

Yes and no, we don't hold the copyright to the images. The museums decide what they want to do with the data. We are, however, very much in favor of Open Access and strive for dissemination of the images, rather than merely having them circulate among a limited number of experts. In fact, I'm considering setting up a portal for our images, to make them available to researchers and even to the general public. I'm also thinking of developing an app that would make it possible for museum visitors to study the images while viewing the painting. Something like this should actually be undertaken by the museums themselves, but we would be happy to collaborate.

Does this mean that future art historians will have to study the exact sciences too, or will technical research remain a special branch in the field of art history?

Technical art history will play an increasingly important role, I think, if what I see happening around me is anything to go by. Whenever I travel and visit exhibitions, I see that the material and technical side of painting is receiving more and more attention. Of course, art historians and curators don't have to become scientists as well, but they should have some insight into the possibilities offered by technical research.

As an art historian you owe it to yourself to follow the developments in your field. The material and technical aspect can lend your art-historical story an added dimension – a dimension that museum visitors find tremendously interesting, I've noticed. It's up to the museums to capitalize on that interest.

You are a "cultural heritage scientist" – a new profession – what exactly do you do? What course of study did you follow?

It is the task of the "cultural heritage scientist" – an intermediary who understands the jargon and the priorities of both worlds – to map out a course of scientific research based on the questions asked by conservators and art historians. The fact is that there are dozens of scientific techniques that can be used in the conservation and preservation of our cultural heritage (even though they were not specifically designed for this purpose), and each method has its advantages and disadvantages. It is impossible for

those who are not specialized in this field to know which technique is required in a given situation.

Two kinds of people become cultural heritage scientists: scientists who specialize in cultural heritage, and those working in the cultural heritage sector who become fascinated by science. I belong to the second category, having studied restoration in Antwerp. Almost from the beginning of my training, I was particularly interested in scientific research. I ended up in the Department of Chemistry at the University of Antwerp with Professor Koen Janssens. I started researching paintings as part of my doctorate, and subsequently earned the first PhD in Conservation-Restoration to be awarded in Belgium. At the beginning I had to find my own way to some extent, but the professorship I recently acquired will make it possible to carry out more systematic research. I'll also be teaching at the universities of Antwerp and Leuven (Louvain), so that this kind of research can flow, via students of restoration and art history, into the sphere of work.

What aspect of the job do you find the most fascinating?

The fact that I can discover completely new information about iconic paintings that are known the world over and have already been studied intensively – that is the most fascinating part of my job.

This new information often surprises art historians. Could you give a specific example?

Last summer I was invited by Professor Katlijne Van der Stighelen of the Catholic University of Leuven to come to the Kunsthistorisches Museum in Vienna, where Rubens's painting *Het Pelsken* was taken off the wall for the first time in fifty years. After scanning, it appeared that Rubens's second wife was not originally standing in front of a neutral, brown background, but against an elaborate fountain with a lion's head spouting water and a *puer mingens*, a little boy peeing. This surprised everyone. Naturally these results have a great influence on the iconography of the painting, which must now be reinterpreted.

That sends you back to traditional art history, so we have come full circle. Does your research often confirm art historians' suspicions or hypotheses?

Yes indeed, usually we are asked to do a scan because someone suspects something or wants to study a certain aspect in more detail. In many cases, we can confirm their suspicions and even provide them with information that is completely new to them. Scanning is frequently of great value to restoration treatments. A good example is,

of course, the Lamb of God, where our scanner visualized the underlying paint layers and their condition, thereby supporting the restorers' decision to remove the overpainting.

Can you still enjoy paintings on a purely aesthetic level, or does it remain strictly professional?

I must admit that it has to rain long and hard before I'll go to a museum while on holiday. I can still enjoy museums, of course, but I confess that I first look at the works in a completely different way, and it is only the second time around that I'm able to admire the work as a whole. First I go in search of degradations, discolorations or traces of overpainting – this is certainly an occupational hazard.

Many thanks, Geert. I wish you much success in your new professorial post.

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