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‘Museums and Their Languages: Is Interactivity Different for Fine Art as Opposed to Design?’

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Introduction

I have been invited to speak about whether interactivity is different for fine art as opposed to design – a topic that is already addressed in part by many of the other speakers at the conference. It is assumed that there is a difference, and that this difference derives in large measure from the nature of the material a museum is called on to interpret.

Some content is seen to be more adapted to an interactive approach than others. I remember vividly the reactions from museum colleagues to our work at newMetropolis, Amsterdam’s science centre, when confronted with the statistics that showed the average visit to the science centre lasted almost four hours. ‘That’s easy for you,’ they would say, ‘you don’t have objects to interpret.’ This reaction is what spurred me to accept the position I currently hold as Director of Frankfurt’s Museum of Applied Art: I wanted to prove that engagement with content is not a question of the nature of the content but with how we interpret it in the museum setting. But this is to jump too far ahead in the story. First of all, it is commonly assumed that it is the exhibit that is interactive. We speak of ‘interactive exhibits’, ‘interactive experiences’ and even of ‘interactives’ as things that can be designed by specialists, that can be tested and whose outcomes can be measured. In all these cases it is the object that is assumed to be interactive: something that can be touched, felt or manipulated is claimed to be more ‘interactive’ than something that cannot.

Interactivity is normally used to mean physical interaction with an object or exhibit – a ‘hands-on’ experience. Most people, when they think of interactive exhibits at all, think of the experience of the Bernouilli blower, with the ball bouncing gaily on a jet of air, or making soap bubbles or making bridges out of blocks – all commonly found exhibits in today’s science centres. Limiting the notion of interaction to merely physical manipulation has been challenged for years, although most proponents still consider hands-on manipulation indispensable. Richard Gregory, founder of Britain’s first hands-on science centre, the Bristol Exploratory, speaks of ‘minds-on’ exhibits and uses illusions to show the workings of the human mind. Jorge Wagensberg, Director of the Museu de la Ciencia in Barcelona, speaks of ‘hearts-on’ exhibits, which he uses to describe exhibits with a large affective dimension. In all three cases interaction seems to indicate a particularly tangible engagement with the exhibit. Even so, the notion of interaction itself – whether hands-on, minds-on or hearts-on – does not give any real indication of the quality of the experience. Interaction is too vague a term. It cannot be used precisely enough to be helpful.

Physical interaction is not a prerequisite for interaction; nor, as Josie Appleton claims, is the visitor obliged publicly to interact. For instance, in my office is a display case specially designed for the Richard Meier monument of which I am steward. In the case is a selection of beautiful glasses, from a sixteenth-century Venetian masterpiece to a set of Boris Sipek glasses. I often use the case to test new text panels; after all, we are not an interactive science centre! I have one text panel with the title 'Glasses through the Century'. It is amusing, informative and written in a popular style. Visitors to my office often stop to read it and chuckle at the humour. I also have another text panel, with another title. This title reads 'One of these Glasses is a Fake'. The difference in behaviour is striking: often visitors stand for ages closely inspecting the glasses. Nor is the question trivial: after all, what is a fake glass anyway? The exhibit, through words alone, confers the property of interactivity on the user, with significant gains in the amount of time the visitors engage with the objects, even behind the daunting glass of the showcase. Surely this too is interaction?

It is, however, no co-incidence that interactive exhibits and the corresponding educational theories that place interactivity at their core stemmed from the science centre movement. Bereft of objects, science centres had as their challenge to render phenomena visible, which almost by definition involved inviting the visitor to participate in the process of creating rainbows, making waves and mixing colours. Moreover, the cultural discourse that would have us believe that the experience of art is unmediated is conspicuously absent in the world of science and technology; no one pretends that a steam engine explains itself or that a chemical reaction can be appreciated without some small understanding of what is going on. The applied arts find themselves as always in the middle but, as the new British Galleries amply demonstrate, this makes it easier for them to exploit the tactile properties of much of their content to create a wide variety of interactive experiences.

It is widely believed that science centres – and, with the example of the V&A, increasingly applied art museums – are themselves more interactive than their fine arts counterparts. On the one hand, a visit to the science centre would seem to confirm this belief. Children run, shout, babble and bellow with abandon, and the scene at Launchpad (in London's Science Museum) or its many cousins is one of unbridled activity. The visitors pull this, push that, peer down microscopes and shout down tubes. On the other hand, in the traditional fine arts museum one is struck by the listless lack of engagement with the works of art. At best a visitor will remain a few minutes in front of a piece of art, and then only in the museums that still have few enough visitors to preserve the calm and quiet needed for thoughtful reflection. At worst, a visitor is caught in the 'Vermeer shuffle' that characterizes the blockbuster exhibition, squeezed relentlessly past a selection of masterpieces in a peristaltic procession towards the inevitable shop at the exit.

But is all as it seems? A closer look at the science centre gives quite another impression. On closer inspection the much-vaunted interactivity often masks experiences that in fact close down the visitors' ability to explore and limit the ways in which they can direct their own discovery. For decades now it has been clear to many science centre professionals that all was not well in the world of hands-on. In a study conducted at Canada's largest science centre in 1987 Drew Ann Wake and her colleagues recorded the following startling findings: visitors tended to use hands-on exhibits for an average of under two minutes, and rarely completed them. On the basis

of these statistics the art museum comes out quite well! Curiously, the same visitors were often prepared to spend over ten times as long with simple wooden puzzles. Moreover, while working on puzzles, visitors tended to talk with each other, share experiences and strategies and use the opportunity for exchanging information. As informal educators, we were reluctant to throw away all our claims to being an educational environment, but it seemed to us that if a visitor spent no longer than 40 seconds with an exhibit, it was unlikely that any serious learning had occurred. On the other hand, while we could not say with conviction that learning had occurred if the visitor spent 20 minutes, it certainly seemed more probable. Apparently not all interactive exhibits are created equal. We therefore started to look at exhibits in a different light, and posed different kinds of questions.

Interactivity as a property of users, not exhibits

What if we started to look at interactivity as a property of the visitor, and not of the exhibit? What if we looked at the exhibit as a tool that if properly conceived, conferred the property of interactivity on its user? What would this interactivity look like?

The trouble with the word 'interaction' is that it can refer to an extremely wide variety of visitor activities, some trivial, some satisfying. These can range from pushing a button to set an exhibit in motion without waiting to see it begin, to spending 20 minutes spent trying to fit three wooden blocks together into a pattern. This variety of behaviour seems to be unrelated to the type of museum: intense concentration can be seen in a fine art museum as readily as at an interactive science centre. It also seems to be largely independent of the technique employed: many 'hands-on' exhibits hold visitors for less than a minute, while a provocative text can keep them engaged for 20 minutes or longer. What does seem to matter, however, is the way in which the interaction is structured by the museum. What is missing is a way to talk about the various ways that we as museum professionals invite our visitors to interact in the museum setting, and to describe the kinds of interaction we want to elicit. Many attempts have certainly been made. In a conference at Tate Britain on 16 April 2002 about evaluating informal learning (organized by the Visitor Studies Group and the Group for Education in Museums) Eilean Hooper-Greenhill listed the following outcomes as being important indicators of engagement: persistence, asking questions, creativity, asking another's support, making one's own definitions and 'show and tell' – all highly desirable.

Some years ago, in an attempt to answer these questions for ourselves, the design team at newMetropolis established several criteria by which we could assess whether we had improved the informal learning environment. In this we followed the work of the American psychologist of creativity Mihály Czikszentmihályi, who described in 1990 what he called the 'flow' experience, which he argued characterizes most intrinsically rewarding human activities, from sport to music to art appreciation. Activities that manifest 'flow' are self-initiated, self-sustaining and often self-structuring. Czikszentmihályi defines flow as:

> a subjective state that people report when they are completely involved in something to the point of *losing track of time and of being unaware of fatigue and of everything else but the activity itself* [italics in original]. The experience should ensure that the opportunities for action are more or less matched by the visitor's ability to act at any given time. In order for this experience to be self-sustaining, it

> must also create the possibility for increasing complexity, to differentiate new challenges in the environment, to integrate new abilities into our repertoire of skills.

In order to continue the 'flow' experience, the visitor should want to return, to try the exhibit again, to do it better a second, third or fourth time.

Following this line of reasoning, the question is: how could we create informal learning environments that became self-structuring and self-sustaining? How could we support the conditions for the 'flow' experience? How could we shift the focus away from the exhibit as end-in-itself towards the exhibit as a support for human activity: discussion, dialogue, debate? How could we develop exhibits that registered the activity of the user, and made it available to other users? Finally, how could we develop exhibits that genuinely changed as a consequence of the user's activity and intentions?

Another way of looking at the challenge is to examine the tension between variety and coherence. This tension can be described in several ways. Fundamentally it is a tension born of the desire to support the greatest number of coherent experiences for the greatest variety of users. However, traditionally coherence has been purchased at the price of a loss of variety: the scientist's taxonomy, the curator's schema, the designer's storyline all militate against the user's freedom to shape the experience of the museum according to his/her own needs. Conversely, an increase in variety often comes with a corresponding loss of coherence – the user is left to his/her own devices to create an infinite variety of confusing and incoherent experiences. When we hear the science centre is under attack and watch its attendance drop sharply, we can see the consequence of delivering neither the variety nor the coherence demanded by the late twentieth-century user. Given the proliferation of media that seem to promise both in abundance, the institution must take a critical look at the opportunities it offers.

At the level of the exhibit the tension can be seen by taking two examples. One has the visitor construct a catenary arch out of carefully shaped blocks that illustrate the principle perfectly – but in only one way. The other is an open-ended play area where the visitor can use a variety of blocks to make a variety of bridges that all stand – but why? Neither exhibit is sufficient to create the conditions for the self-structuring, self-sustaining activity that characterizes what Czikszentmihályi calls 'flow' or what would characterize user-driven learning. Neither exhibit fully supports its user. What kind of activity would we look for in an effective support to informal learning, a support that maximized both variety and coherence at the same time? Two familiar examples allow us to describe such supports: language and games. Both are self-sustaining and self-organizing, and tend towards maximum variety at the same time as maximum coherence. Both constrain the user but at the same time unlock an infinite variety of structured activity. Both rely on the user's ability to decode 'patterns of intention' latent in the structuring of the environment, and use that information to structure new activity. Both can be used as models for the design of successful exhibits.

If simultaneously maximizing variety and coherence is seen as important, the question is: how can we create learning environments that show some of the positive characteristics of language, or of games? How can we create and support experiences that are self-organizing and self-sustaining?

In her book *Reading Frames in Modern Fiction* the literary critic Mary Ann Caws examines the fact that, post-structuralism notwithstanding, many readers remember the same passage in a book. This suggests that, despite the putative death of the author and the uncontested constructive agency of the reader, authors 'do' something with text to create framing devices independent of the individual reader. What if we looked more closely at our work as museum professionals to discover the ways in which we confer properties on our visitors by means of our interpretation? What follows is an attempt to look more precisely at how we create framing devices – interpretive tools that confer the property of interactivity on our visitors.

Shaping interaction with user-languages

In order to develop a more precise way in which to discuss these questions, I would provisionally suggest that we put aside the word 'interaction' for a moment. Instead I suggest we ask ourselves what kind of activity – or if you wish, what kind of interactivity –we want to observe in the museum. The first is sustained engagement – with the emphasis on the word 'sustained' – whereby the user engages in the self-initiated, self-directed, self-sustaining activity described by Csikszentmihályi as 'flow'. The second is 'variety', by which I mean that the visitor him/herself generates new ideas and new directions. We define 'variety' as the degree to which the visitor is directly shaping the course of his/her own experience. With these two criteria in mind we are in a position to define more clearly what we want to see in the museum setting – a self-directed visitor engaged and in control of meaning-making in the museum. The ideal we are looking for is self-sustaining, but it is more than a hamster on a treadmill; it is self-absorbed concentration in which the user helps control the activity. Coincidentally perhaps, this is the behaviour that characterizes puzzle-solving, working in an interactive laboratory, playing an enjoyable game or reading a murder mystery. Self-initiated, self-directed, self-sustaining engagement is a hallmark of experiences whereby we learn, in Jonathan Miller's words, that 'the life of the mind is a pleasure'.

In order to speak of differences of quality in engagement, however, I need to introduce a new term, borrowed from systems research: that of the 'user-language'. As defined by Dutch theorist Gerard De Zeeuw, a user-language is the 'collection of constraints that helps shape the variation generated by an actor into patterned behaviour'. The exhibit's user-language is defined by the constraints it places on the visitor's interaction – the exhibit 'implements' the user-language by imposing constraints on the visitor's experience.

From the moment a visitor arrives, the museum (its designers, its educators, its staff) is constantly placing constraints on his/her experience. Contrary to some opinions, there are relatively few unconstructed and unmediated moments in a museum setting; the museum wittingly or unwittingly shapes virtually every aspect of the visit. It does this by presenting some things and not others, in a particular order and not another – in short, by constraining the visitor. These constraints could take the form of directional text, they could be the choice of colours, or they could involve the deliberate placement of objects in a room. For instance, we may decide to put a Picasso painting beside an African mask. By doing so we have deliberately made meaning, and are inviting the visitor to explore that meaning. This interpretation is a large part of what we do as museum professionals. We often think that what we are communicating is

purely content. We write texts and we tell ourselves it is only about content – and that all that matters is using the active voice, writing short sentences, avoiding difficult words in order to communicate the content clearly. But the meaning we want the user to construct is not just about the relationship between Picasso and his sources; it is also about the relationship between the museum and the visitor/user. Who is in control? Who makes the meaning? Who gets to say which features were important to Picasso and which weren't? I would argue it is very important to see that no label is just a label, no juxtaposition of objects just two objects together. Everything we do in the museum is intended to create meaning for the unknown, and by definition unknowable, user and proposes a specific role for the visitor in his/her own exploration of the museum environment – his/her own meaning-making. In this respect it is not only what we say that matters but also, more importantly, the invitation we make to the user to enter into a certain relationship with the museum. The means through which we structure a specific relationship to the visitor by means of our exhibits is the user-language.

The exhibit's user-language describes what counts: what can be included and what is made invisible. The user-language constrains interaction with the exhibit, and in so doing confers specific properties on the user. In the museum the most significant user-languages are 'textual authority', 'observation', 'variables', 'problems' and 'games', in so far as these user-languages impose constraints that confer certain desirable properties in the museum setting. The notion of a user-language allows us to describe and analyse the museum label in terms of both its content and its intent. For instance, a text about a given subject written in the first person could use any of a number of different user-languages; it could cite canonical texts, recount observations, weigh different possibilities, propose a murder mystery or suggest a game.

What do I mean when I say that a user-language can confer a property? A loaded gun, lying on a table in an empty room, has certain properties in terms of which it can be described: its weight, size, calibre etc. If this loaded gun is given to a person in a crowded railway station, the gun confers the property of being dangerous. A 'new' entity is created – a person with a loaded gun.

Neither the person with the gun nor the gun itself remains the same. The person has become dangerous, certainly, but the gun too has a new property: its trigger can now be pulled. The properties conferred, both on the gun and on the person, are largely independent of the individual character of either. The person need not be a psychotic to be dangerous. The gun need not be a particular calibre in order to be fired. Moreover, these properties are only conferred in a specific kind of setting. If the gun is handed to a person at the bottom of a swimming-pool, the property of being dangerous is presumably not conferred – nor even, perhaps, the property of being able to be fired.

What is true in the example above is true of all support systems, which is what gives the notion its strength. Support systems convey properties independent of the specific particularities of the user. All the user has to do is to choose to use the support. The person could refuse to accept the gun, of course, just as a user can refuse to accept a support.

As in the example of the gun, interpretation can be studied by looking at the user-languages it employs, the properties these languages confer on the user, and the

properties the user confers on the means of interpretation. It should be possible consistently to develop exhibits that confer desired properties on the user, and for these properties to be largely the consequence of the choice of user-language of the exhibit, in so far as particular user-languages are more effective at conferring certain properties.

For the our purposes user-languages can be ordered in terms of the ways in which they support variety generated by users – from the user-language of 'authority' at one end of the scale to the user-language of 'infinite games' at the other. In the user-language of authority, effectively the interpretation has only one dimension: that of the voice of somebody else as an authority. In the user-language of 'observation' the user is addressed as an observer and hence given the property of being his/her own authority. The user-language of 'variables', an extension of the user-language of 'observation', marks the emergence of the modern museum, as it confers the ability to see not only the visible but also the invisible relationships between things. The user-language of 'problems' confers on the user the power to act, while the user-language of 'games' makes this agency an indispensable condition of the experience, and confers the additional property of other players: with only one player there is no game.

Let's take some examples to illustrate different user-languages in action. Most conventional museum texts are written in the third person – dispassionate, the voice of authority, the voice of God or, if not God, perhaps a Nobel Prize winner or a distinguished scientist. For example, a text written by (anonymous) curators at the Museum of Natural History, Washington:

> Maintaining high body temperature is very expensive. In fact, dinosaurs could enjoy the advantages of high and constant body temperature 'on the cheap'. Because of their enormous bulk dinosaurs retained the heat generated by normal, everyday activity, such as walking. They did not have to add to it by processes that required additional food, as birds and mammals do. Perhaps this is why so few kinds of dinosaurs were small.

So when I read this text, it is not just about palaeontology – the manifest content of the text. It is about the palaeontologist as well – the authority of the text writer. More importantly, it is about the reader's relationship to this authority. The implicit message of the text seems to be, 'I know more than you do'. At the very best it suggests that the visitor is to be a listener, the museum a storyteller. The text not only gives information; it proposes a relationship between the text writer and the text reader. Such texts propose a relationship based on authority: the 'currency' of the text is the authority of the writer. Most museums rely heavily on their curatorial staff to write their texts and on what we can call the user-language of authority to communicate their messages. Authority is not the only user-language, although it is perhaps the most common one found in museums of all kinds.

Some museums, particularly science museums, use the user-language that in fact characterizes science itself – the user-language of observations. 'Look at this. What do you see, what does it tell us?' In the user-language of observation the currency is shared observations: things are true if observations can be reproduced and shared. A science centre exhibit label may say to the visitor, 'Do this, turn a handle and something will happen. What happens if you turn the handle faster, or slower?' For

example, a text accompanying the tornado exhibit in the Palais de la Découverte in Paris in 1993 read:

> Look at the tornado. Three coils heat the water in the basin, and the steam is thus put into motion with the help of a fan at the top of the cylinder. The vapour condenses into fine droplets of water to give a thick mist. If you press on the button, the fan stops. What do you notice?

The exhibit has made a certain observation available for sharing and confirmation. This user-language actually offers the visitor a role to play – albeit a minor one. Science centres also often make use of the user-language of variables, a mainstay of science itself, which is really a way of grouping several different observations.

However, in all of these three commonly used user-languages – the user-language of textual authority, the user-language of observation and the user-language of variables – we instruct the visitor and we decide which role he/she has to play. The visitor might well say, 'Look – I saw that' and endorse the observation. However, it is an endorsement of the observation we wanted him/her to make. We expect our visitors to see what we have put there for them to see.

With the user-language of problems, the user is in the driver's seat and the user, not the institution, sets the agenda; the role of the museum is to support him/her. In the user-language of problems the activity is structured according to a constellation of solvable challenges. Take, for example, a text by Drew Ann Wake for the exhibition 'Beyond the Naked Eye' (1991) in Calgary, Alberta, Canada:

> #3 Be a Brain Surgeon!
>
> You've always thought you'd make a great brain surgeon. Cool hand. Quick mind. Patience of a saint. Well, now is your chance to try your hand at it.
>
> If doctors suspect a tumour within the brain, they will use CT scans to help find out where it is located and how big it is. But, they will also want to make as few scans as possible.
>
> Take an apple (or a potato) out of the jar and put it on the cutting board. Imagine it is a brain. Your challenge is to find a 'tumour' hidden inside.

Or in the event that you think that only science centres are in the position to use the user-language of problems, take the following example by Joaneath Spicer, from the Walters Art Gallery in Baltimore (1992):

> A Renaissance Puzzle: Heemskerck's Abduction of Helen

Panoramic Fantasy with the Abduction of Helen, painted in Rome in 1535 by the Dutch artist Maerten van Heemskerck, is one of the most famous northern landscapes of the 16th century. Its fascination rests not only on the visual appeal of its haunting luminosity, but also on the intriguing insights it offers into the Renaissance mind: to begin with, the search by Heemskerck and his contemporaries for a new pictorial language derived from antiquity. […] Heemskerck, with his Netherlandish love of appealing detail, has created an amazing picture-puzzle, offering an intriguing and humorous challenge to the educated 16th-century viewer who could locate and identify the pieces. We hope that in this exhibition you experience again the delight in this challenge. Many clues will be offered, including surprising ones as to Heemskerck's intentions found even in his choice of materials.

But it is for you to put the pieces together!

The next level of text is more specific, and supports the visitor to think like an art historian:

Theories as to what the painting really means

I

A discourse on the transience of life, taking its cue from the eventual decay of Helen's beauty and examples of once-great civilizations. This moral consciousness is found in Heemskerck's later engravings in the Netherlands, but such moralizing is uncommon in Rome.

II

A romantic, light-hearted celebration of the excitement of sexual love that takes its cue from Paris and Helen's mutual infatuation and his abduction of her (more an elopement). This is amusingly amplified by the aroused pigs and the statue of Priapus, Roman god of sensuality and regeneration. Italian society was not bothered by moral ambiguities, and the subject is found on many contemporary marriage chests, where allusions to the sexual pleasures of marriage are traditional. The cityscape is then a pretext for a splendid array of marvels as evidence of the greatness of the ancient world – a romantic setting on an epic scale.

If a celebration of love and if a commission, the marriage would be a celebration of a specific marriage or engagement, probably signaled by the arms on the Trojan galley shields. Only the first three from the right are now clearly legible: France, Holy Roman Empire (Habsburgs), the Farnese, (a blank), Austria and Savoy (illegible). Among these families there are many ties of allegiance and possible weddings, one being that of Alexander de Medici, Duke of Florence, and Margaret of Austria, daughter of the Emperor and god-daughter of Margaret of Savoy, in 1536 (Paris was called Alexander by some writers).

See which solution you prefer!

In terms of engagement, the most interesting – and the most challenging – user-language is the user-language of games. A true game structures play and provides goals and closure rules. Most importantly, a game provides a measure of improvement and is open to infinite variation by the players, who participate voluntarily. In most games, such as football, hockey, tennis or cricket – referred to by Carse as 'finite games' – there must be a way to win. In other games, far fewer in number but not as rare as you would imagine – such as tag – the goal is not to win but to sustain play. These games are referred to by Carse as 'infinite games'. In a finite game the rules must stay fixed by convention and are inviolable by the players in order that closure is achieved. In an infinite game the rules must be plastic in order that the players can sustain play as long as they desire.

Consider the following example taken from newMetropolis (1997):

Welcome to a special factory – a BALL factory.

This factory sorts and codes SIX different balls.
Both the YELLOW balls and the BLUE balls come in two sizes.
The small RED balls come in two weights.
Your assignment is posted on the computer screens.
Sort orders of SIX BALLS – by weight and by size –
then send them away to be coded!

How fast can you make up the right order?

In the case of this user-language science centres have a certain advantage over other museum types, although it is not impossible to imagine games being developed effectively in an applied art, or even a fine art museum.

Conclusion

To conclude, the user-language of 'textual authority' always constrains the amount of variety a visitor can generate. The constraints of the user-language of 'textual authority' privilege the authority cited, and make acceptance of the authority of the authority a 'take it or leave it' affair. The user-language of 'observation', which exploded like a bomb under the foundations of centuries of intellectual discourse based on the exfoliation of texts, grants an important role to the observer but is obliged to constrain both the observations and the conditions of observing. The user-language of 'variables', which is in effect a prolongation of the user-language of 'observation', confers the property of control on the visitor. The visitor can experiment, test, compare and classify observations. Nevertheless, both the observing and the conditions of observation remain constrained.

The user-language of ‘problems’ supports the visitor’s attempts to define, analyse and solve, and to compare the merits of different formulations. The solution to one problem may in fact lie in redefining it. Here the property of agency is conferred on the visitor, and acceptance is encouraged by identifying problems related to and derived from human experience. Finally, the user-language of ‘games’ creates the conditions for enormous variety, by conferring the property of other players, with other, competing interests. Some games come to an end at an agreed point (the expiration of time, the reaching of a certain score, the accomplishment of an action); others (what Carse calls infinite games) end only when the players decide to stop. The goal of an infinite game is to keep playing. Infinite games remain open to new rules and new information to achieve this end. It is important to note that only the latter two user-languages – that is, those of ‘problems’ and ‘games’ – confer the property of agency on the user. That is to say, they allow users to structure their experience in terms of time rather than in terms of some kind of infinite timelessness – as, for example, happens in the case of the language of ‘textual authority’.

This last conclusion has striking consequences for the future of the museum. User-languages that do not confer the property of agency are, in a sense, ‘exhausted’ by their use. They support the user while they are being used, but the properties they confer disappear when the user stops. However, if the goals of a museum can be said to support repeat use and, perhaps more ambitiously, to support the acquisition of new skills, the museum can no longer rely on user-languages that do not confer the property of agency. It cannot rely on user-languages that are limited to conferring certain properties to the user only while she is using the support: in order to foster acquiring new competence, the properties conferred must be sustained over time. This possibility of support over time is only possible with user-languages that confer the properties of agency and also other players – the user-languages of ‘problems’ and ‘games’, and presumably languages that still have to be designed.

To return finally to the question posed at the outset: is interaction different in museums of fine art from what it is in museums of applied art or design? I would have to answer, no. The nature of the engagement in any informal setting is potentially the same, subject to the way in which the museum chooses the user-languages it employs, and the degree to which the museum reduces the barriers that prevent the user from engaging with the material. Where museums do differ, however, is in their deliberate use – or avoidance – of specific user-languages. Science centres were among the first to be forced to explore the user-languages of observation and variables, as both are proper to the natural sciences. Given their history, they were also among the first to explore the user-languages of problems and games. This is not to say, however, that fine art museums cannot make equally good use of these user-languages. Joaneath Spicer at the Walters Art Gallery in Baltimore turned her entire museum into a resource to solve an art-historical puzzle, and the new British Galleries at the V&A are rich in exhibits that employ the user-languages of puzzles and even games.

What is important, I believe, is not the nature of the museum’s content but the degree to which we make explicit use of particular user-languages in order to engage our visitors in the pleasure that comes from actively exploring and constructing the world in which we live in all its variety.

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James Bradburne is a British-Canadian architect, designer and museum specialist who has designed World's Fair pavilions, science centres, and international art exhibitions. Educated in Canada and England, he developed numerous exhibitions, research projects and symposia for UNESCO, national governments, private foundations, and museums world-wide during the course of the past fifteen years. He currently sits on several international advisory committees and museum boards, and recently curated and designed exhibitions including *Rudolph II* (Prague 1997) and *Blood: perspectives on art, power, politics and pathology* (mak.frankfurt/Schirn Kunsthalle). He lectures internationally about new approaches to informal learning, and has published extensively. In 1994 he was invited to join newMetropolis Science and Technology Center in Amsterdam as Head of Design, Research and Development, and was responsible for the planning of new exhibits, exhibitions, programmes, and products for newMetropolis. As of January 1st, 1999, he has been Director of the Museum für Angewandte Kunst in Frankfurt am Main (mak.frankfurt).