

Dinosaurs and white elephants *The science centre in the 21st century*

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ABSTRACT

This paper argues that science centres are expensive to create as capital projects, expensive to maintain with professional staff, and, given the high costs of exhibit development, expensive to change. Lacking a fixed collection of unique artefacts with which to attract visitors, the science centre is at risk when it cannot change quickly enough to meet the demands of its users. In the past, temporary exhibitions have been used as a means of creating more frequent change. Now, however, given the exponential increase of the availability of new electronic media, such as home computers, CD-ROMs, and soon, interactive television, coupled with their massive interconnection via the Internet, the informal learning that once was the preserve of the science centre can now be had at home and in other sites, thus rendering the science centre unwieldy, expensive, irrelevant, and obsolete. In short, the science centre is faltering because, on the one hand unlike the museum, it has little that is truly local - nearly everything that can be found in one science centre can be found in almost any science centre - or on the Internet, and, on the other hand, the mission of the science centre no longer meets the needs of the world we are in the process of creating.

These threats to the science centre cannot be lightly shrugged off, and it is clear that a real transformation of the institution is required. If science centres cannot rise to these challenges, they risk becoming, like the planetarium before them, the '8-track cassette' of late twentieth century institutions - a transitional moment, fundamentally flawed, and soon replaced by new technologies. The paper concludes that the science centre as an institution and as a building project, is doomed to extinction, as a consequence of two factors - ecology, and economy - and argues for the need to develop a new kind of institution of informal learning in its place. newMetropolis in Amsterdam is one possible direction such new institutions could take.

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First of all, I would like to congratulate Public Understanding of Science and its new editor, Bruce Lewenstein, for its support of this open discussion about the future of the science centre in particular, and informal learning in general. The field has suffered for decades from the lack of real debate, fueled perhaps by the belief that the supporters of the science centre movement - the NSF, local governments, and corporate sponsors - would withdraw their support if any sign of dissent showed in the ranks of the movement. Now, some thirty years after the opening of the San Francisco Exploratorium, I believe we are mature enough to encourage a critical look at our institutions, our field, and our performance.

Second, I would like to make it clear that what I am about to say is my personal opinion, based on many years working in the field of informal education, and not the official position of the institution I represent, newMetropolis in Amsterdam. You will understand my caution better when I explain the thesis I am about to present - that the science centre as it is presently defined is a dinosaur threatened with extinction in the not too distant future, and that the science centre as a capital project is a white elephant, that can only saddle the government with unrecoverable debts. I have therefore entitled this paper, Dinosaurs and White Elephants: the science centre in the 21st century.

I have come to the conclusion that the science centre is doomed the hard way - after spending nearly fifteen years working on new approaches to creating public informal learning environments, including museums, art galleries, World's Fair pavilions, and of course, science centres. Almost ten years ago, in a paper written in 1989 subtitled Truth telling and the Doing of Science¹, I attempted to sketch a provisional history of the science museum as an expression of changes in the history of ideas - notably in the history of science. I argued that the seventeenth century emphasis on shared observation, an emphasis that largely defined the modern period, had profoundly shaped the development of all our institutions of informal learning, as the paradigm of the natural sciences was appropriated in every field of human activity. I argued that the resurgence of idealism in the twentieth century, in both philosophy and in the sciences, had prompted a parallel transformation in the science museum - and that we were witnessing the birth of a 'third generation' of science museums, based on the active practices of doing science, rather than on the passive receiving of science as a canon of accepted truths. It was clear to me that we needed a new model for our institutions, based on the fully engaged activity of the visitor. I closed by saying "Third generation science is an attempt to unhook the cart of absolute truth from the horse of enquiry, so visitors can leave not saying "I know", but rather "I know *how* to know".²

Since 1989, I have been one of a growing number of planners who have championed the idea that our institutions of informal learning must undergo dramatic change if they are to survive and remain relevant in the next century. Over the course of the past nine years, often in collaboration with the Canadian anthropologist and museum planner Drew Ann Wake, I have been involved in a number of new approaches to the creation of informal learning environments. All of these approaches have stressed two key factors - 'bottom-up', or user-driven learning³, and flexibility. The first means that the user must be considered the starting point for all effective learning - most science centres argue that interaction is enough - however, hands-on exhibits rarely allow visitors to actively shape the nature of their enquiry⁴. The second, that our strategies, exhibitions, and institutions must be able to respond quickly and effectively to change - most science centres recognise the need to change rapidly, however, by focussing on their exhibitions, they cannot respond quickly or effectively. Many of the experimental projects developed during this period may be familiar to you. The Body in the Library⁵, for instance, in which forensic science was cast in the form of a murder mystery, is now found in various forms in science centres from Sudbury to Copenhagen. Beyond the Naked Eye⁶, an exhibition about medical imaging technologies, based on case studies and medical challenges, has been widely copied. Mine Games⁷, an exhibition where the subject of earth sciences was transformed into a forum for debate on the future of the mining industry, was the focal point for social and political discussion about resource use in British Columbia for over two years. Finally, newMetropolis in Amsterdam opened this year⁸ as a challenge to the view that science centres should have science as their central concern⁹.

Despite the success of these experiments, few science centres seem to have called their practices into question. New science centres continue to be planned based on the traditional pattern of clusters of hands-on exhibits about science and scientific principles (the single largest exhibit topic is physics)¹⁰, and existing science centres continue to develop exhibitions based on the assumption that physical interaction is a good thing, in and of itself. These traditional exhibit approaches share three signal weaknesses. They focus almost exclusively on principles and phenomena rather than processes, they misrepresent the nature of scientific activity, and show science out of context - science defined 'top-down' by scientists, rather than as experienced by visitors¹¹. Even when an institution tries to put science and technology into a social context, it is science and technology that is the point - not the society¹². The dominant model in which science centres 'vulgarise' knowledge and make it available to the masses, or sugar-coat science with gratuitous hands-on interaction to arouse visitor curiosity¹³, is rarely if ever questioned¹⁴. However, as a consequence of its inability or unwillingness to change, I would argue that the science centre as an institution is now under attack - an attack signalled by falling visitor numbers and the recent closure of

institutions such as Baltimore's Hall of Exploration¹⁵. Its mission no longer meets the needs of society, its relevance to the public is diminishing, and it is being made superfluous by new communication technology.

These threats to the science centre cannot be lightly shrugged off, and it is clear that a real transformation of the institution is required. If science centres cannot rise to these challenges, they risk becoming, like the planetarium before them, the '8-track cassette' of late twentieth century institutions - a transitional moment, fundamentally flawed, and soon replaced by new technologies. After nearly ten years of trying to create a 'third generation' science centre, I can only conclude that the science centre as an institution and as a building project, is doomed to extinction, as a consequence of two factors - ecology, and economy.

Let us start with the proposition that the science centre is a dinosaur. Certainly the current building boom in America and Europe, notably in the United Kingdom, would suggest that the science centre is alive and kicking¹⁶. The number of science centres world-wide is growing¹⁷, and there appears to be no end in sight - how could I possibly suggest that the institution is facing extinction? My metaphor is chosen deliberately. Dinosaurs became extinct for three fundamental reasons - rapid change in the climate, insufficient food to sustain their bulk, and increased competition from smaller, more flexible forms of life. In the same way, the life and death of the science centre as an institution is a question of ecology, and its demise just a matter of time.

Let me review these three points in detail:

- **the traditional science centre mission is no longer relevant.** In its modern form, the science centre is a creature of post-War American society. Spurred by the Soviet's conquest of space with Sputnik, stimulated by the race to put a man on the moon, and alarmed by the increasing public scepticism about the benefits of such scientific blessings as pesticides, nuclear power, and genetically altered food, government and industry supported the science centre as a means of informing the public about science and technology. Like the dinosaur, the science centre fitted into an ecological niche - fed by government and industry in the lush tropical climate of the Cold War. Of course it was assumed that once understood, science and technology, and the interests that directed them, would be seen in a favourable light. Thus science centre literature included statements like the following "Still, all too often do the negative aspects of science and technology get attention, and not their positive effects on society. In order for society to fully benefit from science and technology, accepting them is an absolute necessity. The applications in our daily life are often experienced as threatening and lead to the feeling of lacking knowledge. One tends to ignore science unnecessarily. NINT can play an important role in informing the normal citizen."¹⁸

To fulfil its role "The objective is to excite interest in the basic principles of the natural sciences and the technological applications."¹⁹ The mission of the science centre was to inform and convert - learning about science and technology was seen as a prerequisite for citizenship. One of the leaders of the crusade, Jon Miller of the Public Opinion Laboratory at Northern Illinois University, commented "I doubt that anyone would argue that a citizen who failed the minimal set of items included in this measure [of scientific literacy] would be very effective in following major issues in science and technology."²⁰ Implicit in the enterprise was that the public was ignorant, and that the new science centres, with their emphasis of hands-on, interactive experiences, would

cajole and delight the public into understanding, and thus accepting, the social programme of those directing the scientific enterprise²¹.

Now at the threshold of the 21st century, the Soviet threat collapsed, the Cold War behind us, the traditional mission of the science centre is no longer relevant. New challenges face society, and understanding science and technology, in and of itself, does not seem to hold out the key to meeting these challenges. As Jean-Marc Levy leblond noted, being an engineer is no more necessary to taking a position on the use of nuclear power than being a lawyer is necessary to vote. The issues facing the public are almost all social issues, in which economics, ethics, and politics play as important a role as science and technology. The globalisation of the economy has now shifted the emphasis from political to economic survival²². In order to remain competitive in a period where the 'high-volume' production is increasingly being done in countries with lower labour costs, European society must create a new 'high-value' economy if they are to survive²³. Such an economy means a dramatically new approach to education, an approach in which informal education, and a commitment to lifelong learning, plays an essential part²⁴. If Europe is to survive economically, it must become a learning society, and its institutions must turn their attention to the challenges of enhancing skills, rather than merely dispensing information and arousing curiosity. This change in economic climate has been understood by national governments and industry, and has been clearly signalled in the EU's 5th programme framework, which outlines the research and economic development strategy for Europe for the next four years, and stresses the importance of adapting to rapid change²⁵. The traditional science centre focus on scientific information is just no longer tenable if the next generation is to keep up with the speed with which society is being transformed. Knowing how a telephone works is not going to help us - knowing how to use one is.

- **the institutional model is no longer appropriate.** In several key respects, the science centre has grown out of the museum tradition. Broadly speaking, institutions of informal learning follow one of two models - the library, and the collection. The library is a resource, and it puts the accent on use, especially directed by the user himself. The organisation of a library is a function of its use. The collection, on the other hand, is meant to be displayed, and its identity is bound to the collector, or more recently, the curator. The organisation of a collection is a function of the messages its organiser wishes to communicate. The prime consideration of the library is the user - of the collection, the visitor. The science centre has largely followed the model of the collection, despite the fact that one of the distinguishing features of these new institutions - hands-on science centres - is that they had no collection. The first of them, the so-called 'second-generation'

science centres, were, in effect, collections of physical principles and phenomena - the science centre was as 'a forest of phenomena' in the words of Frank Oppenheimer, places where the public could experience at first hand real phenomena - spectra, electricity, inertia, and illusions that allowed the visitor to reflect on his own perception - phenomena increasingly being squeezed out of the classroom and out of daily life as well. Nevertheless, like museums with collections, the function of these institutions was to show, to display, and to illustrate²⁶.

But following the model of the collection came at a high price - that of dependence on visitors. A collection is visited, and once visited, the visitor's task is fulfilled. The objects in a collection are exhibited - displayed to a public who is often unable to engage with it due to lack of interest, inclination, or information. With their phenomena and principles enshrined in hands-on exhibits, their outcome repeatable and predictable²⁷, science centre's collections too are often exhausted by the visit²⁸. Notwithstanding the importance of the 'affective' or emotional impact of the museum visit²⁹, several museum visitor studies suggest that most museum visitors come three times in a lifetime³⁰ - as a child (often in a school class), as a young parent, and as a grandparent³¹. This general pattern is of course mitigated to some extent by what the tourist industry calls VFF - Visiting Family and Friends - so when your sister-in-law drops in with the kids, or your school chums passes through town for the weekend, a trip to the museum might be the perfect way to spend a Sunday afternoon. While it is true that schoolchildren often come more frequently, depending on the museum's outreach programmes, these visits are often compulsory, and cannot be credited to the museum's attraction as an informal setting. However, notwithstanding VFF, and school visits, this three-visit pattern tends to force the science centre to create temporary exhibitions as a means of generating repeat visits. In fact, the modern temporary exhibition is a creature born out of a desire to increase the number of visitors. In the 70s, the great 'blockbuster' exhibitions such as King Tut, proved that the exhibition could also be a major money-earner, as well as a sure generator of extra visitors. Without change to generate repeat visits, or an influx of new visitors, the number of visits inevitably declines. Attempting to rely increasingly on transient tourist visits only compounds the problem by marginalising the local audience. Paradoxically, however, increased visitor numbers impair the ability to deliver the high quality engagement that is at the heart of the museum, and science centre, experience. Large numbers of visitors shorten and degrade every individual's ability to engage with the exhibits, and, when international tourists make up the bulk of the visitors, the local community is squeezed out almost entirely³². And, if the science centre expands to meet the increased demand, it incurs increased operating costs that only make the problem worse - the dinosaur ends up being unable to feed its increasingly heavy bulk.

This is the crisis most science centres are now facing. The recent data published by the Association of Science and Technology Centres (ASTC) paints a picture of growing science centre attendance³³. This is certainly true, if one includes the new centres and their visitors. But a closer look at the figures tells a different story³⁴. If the attendance to new centres is discounted, many science centres are seeing their visitor numbers fall annually - often dramatically in the case of 'middle-aged' institutions³⁵. If these figures are then adjusted to eliminate the transient effect of temporary exhibitions, the picture is even bleaker³⁶. This suggests that the science centre is becoming a victim of the institutional model it has chosen to follow. By defining its success in terms of visits, not use, the science centre slowly exhausts its pool of potential visitors. On the other hand, the library model is in a far better position. A library is both rooted to its community of users - and global, in terms of the resources it makes available. As a resource centre, it can service its users in a wide variety of ways. A library is not exhausted by a visit, on the contrary, it is refreshed by it. A library is used, and as long as the library provides resources and experiences - real or virtual - that are needed by its users, then its health is guaranteed. The model of the collection - particularly in an institution without one - cannot be remedied by money. It can only be remedied by change.

- **the institution cannot compete.** An institution can only survive if it provides a product or service unavailable elsewhere - at a competitive price. The traditional science centre provided an environment in which visitors could manipulate simple interactive exhibits about the phenomena and principles of science. These experiences were largely unavailable in the classroom, and were novel and exciting to use. They were also very easy to imitate, desirable in a pre-Internet period, and, like a kind of educational MacDonaldis, there was an explosion of science centre building that has still not ended. Now there are over 800 science centres world-wide, and nearly every major city has a science centre. In these science centres there are experiences - for example an artefact or a demonstration or making a dam in running water - that cannot be replaced by new media. The power of a live demonstration cannot be replaced by a talking head on a 17" screen, whatever the inherent interest of the subject. However, hands-on interaction is not always enough to sustain engagement³⁷, and the science centre is no longer the only institution to offer informal learning opportunities. It must now compete for the attention of its visitors with other informal learning resources - notably CD-ROMs, video games, and television - that are often far less expensive, and better still, available at home on the Internet³⁸.

When many science centres were founded, the computer revolution had not yet begun. I remember as a young student going to the Ontario Science Centre in Toronto to see their computers - computers for which they had paid a great deal of money. Some of these computers - the IBM 360 for instance - filled an entire climate-controlled room. No-one imagined that within only a matter of years, the personal computer would invade the household. Certainly no-one imagined the revolution brought about by the use of the Internet, and within a matter of years, broadband communication over the 'net will turn the home into a resource centre for interactive activities - video-on-demand, networked games, discussion groups, forums, debates. The science centre, lacking a unique collection to begin with, is now extremely vulnerable to the increasing ability of new technologies bringing to the home what was heretofore only available at the science centre³⁹. The competitive pressure is enormous. Why go to a science centre at all? And at prices that go as high as U\$50.00 for a family of four, why pay for the privilege?

Nor is the science centre the only institution of informal learning. Increasingly other institutions are providing high-quality learning opportunities outside the formal system - research labs, community centres, and libraries all provide workshops, lectures, and seminars. The entertainment giants like Disney and Spielberg have also begun to move into the field of informal learning, newly baptised 'edutainment', and Disney claims to create 'an imagination-powered playsite where children and their parents can build important bonds through interactive and creative play.'⁴⁰ The science centre must now compete to deliver a unique and irreplaceable experience to all its potential users. And, as long as science centres remain wedded to their narrowly defined mission, they miss out on the opportunities to reach audiences not interested in science and technology as such, but in society as a whole - which includes issues such as environmental protection, genetic manipulation, euthanasia, urban development and crime. As long as science centres continue to define themselves apart from culture as a whole, they risk losing out to other institutions and other interests. Like the dinosaur, the heavy and slow-moving science centre is now threatened by smaller, lighter, more agile opportunities, which stand to take its place in the ecology of informal learning.

The above argument suggests that the science centre - as an institution - is no longer able to meet the challenges that will face us in the next century, and will thus become extinct in due course. But what about the science centre as a building project - a civic monument? If the life or death of the institution was a question of ecology, the decision of whether to build or not is a question of economy. Over the past several decades, we have experienced an explosion of new museum - and new science centre - building. With the state supplying the cash and the clock ticking down to the year 2000 providing a symbolic deadline, there seems to be no slowing down in sight, as new projects in Britain, America, and the East continue to near completion. The price of overbuilding in the museum community is already beginning to be seen, and cautious critics are already worried about the prospects for today's new science centres in ten years time⁴¹. The case against embalming the institution in a new, expensive, and inflexible building can be summed up as follows:

- **high capital costs.** The costs of any new building are high, and with climbing interest rates the cost of financing makes it imperative to build quickly and efficiently. A science centre is a special kind of building, with special needs in terms of services and facilities, and special challenges to overcome in order to accommodate interactive exhibitions. Often special media are called for - IMAX, OMNIMAX, Showscan, virtual reality CAVEs - all of which represent a large initial investment and a high degree of involvement on the part of architects, designers, and planners. The architectural fees for designing science centres are high, and with the shortened building schedule, the risks are also high. The chances of a major science centre project staying on time and on budget - however well managed the project is - are very slim. Added to this are the costs of exhibition development, which are a function of how much new design is desired. The greater the amount of prototyping, the greater the cost, the greater the risk, and the longer it takes. These capital costs are not normally recovered by the revenues generated by the project after opening.

- **high operating costs.** Once it is built and opened, the science centre must be operated. Depending on the size of the centre, this means a substantial investment in floor staff, workshop staff, administrative personnel, and maintenance workers, not to mention the costs of keeping a public building going - light, heat, water, power. The larger the institution the greater the investment in operations, and the greater investment in personnel. The greater investment in personnel, the less flexibility the institution has when it comes to responding to fluctuations in revenue. The tail begins to wag the dog - programmes are designed to keep staff in work, not to serve visitor needs. Attendance to a traditional science centre is closely related to the weather - when it is raining

visitors come in droves, when it is sunny visitors go to the beach. Unfortunately, the weather is not among the factors over which the science centre can exercise much control.

- **high maintenance and renewal costs.** Finally, due to the highly interactive nature of their exhibitions, science centres must devote a substantial percentage of their operating revenue to maintenance and renewal. More importantly, due to the nature of their exhibitions, renewal plays an important part in a science centre's ability to generate new revenue. Science centre exhibitions, however, are generally expensive and require specialised staff to design. Few science centres generate enough revenue to renew their exhibitions as often as would be ideal, and fewer still can afford to keep in-house the specialised staff required to design them. As a consequence, temporary exhibitions are brought in from other sources, or designed by outside firms - with a corresponding impact on the institution's budget.

Given the above, it is possible to argue that society should still fund new institutions of informal learning, albeit not necessarily science centres in the strictest sense. Funding an institution, however, does not mean funding a building project, and the reasons for building must be carefully considered. Institutions do not necessarily need new buildings. Projects around the world have shown that an institution can survive in makeshift or borrowed surroundings, and take advantage of existing facilities to mount its exhibitions, workshops, and programmes. Thus instead of spending a huge amount in 'bricks and mortar', badly needed capital can be supplied directly to projects and people⁴². Why spend 60% of the investment capital on the building, when it could be going into programmes? It could be argued that the capital costs are amortised over the life of the building, however, it can equally be argued that investing \$3 million/year in programmes and temporary events for ten years could be just as wise an investment as spending \$30 million to get the doors of a building open once.

A typical interactive science centre exhibition cost @U\$ 2 500/m².⁴³ It must be built to withstand hundreds of thousands of visitors, and it must be expected to last two, three, or even more years. On the other hand, high-quality temporary exhibitions can be developed and built for as little as U\$ 500/m²⁴⁴, and can be readily transported, repaired, and replaced. Even less expensive are programmes intended for the Internet. Forums, discussions, and debates can all be prepared quickly and effectively with a relatively low investment of staff time. Creating interactive resources for the electronic networks - particularly broadband - holds out great promise for the future, as our institutions move away from the limitations imposed by physical building.

We know from the research of Marilyn Hood⁴⁵ and others that for the majority of our visitors, the public physical space is one of the central motivations for visiting. Although it tries to, the Internet cannot replace real public space (not to be confused with the social space of dialogue, which can be very effectively supported by Internet). The extraordinary variety of a two-hour visit in a public space, wherein one can read a paper, play a computer game, make a bridge out of blocks, have a coffee, kiss your sweetheart or chat with friends, can never be rivalled by an experience circumscribed by a video screen. A public space is one which has other real, flesh-and-blood creatures in it, creatures demonstrably different from their e-mail addresses, opinions, or self-representations. However these may overlap in the virtual space of the Internet, the human body only exists in space, and the public human exists in a public space. However, a public space need not be a permanent space, as Ciencia Viva in Rio de Janeiro⁴⁶, Science Alberta, and the Palace of Miracles in Budapest have shown. Once freed from the burden of running a large and complex building, projects and programmes can be developed that make the fullest use of human resources. A small core staff can manage a large number of initiatives. Temporary projects can rely on temporary, appropriate staff, and longer term projects can be structured in such a way as to give the institution the greatest degree of flexibility. Why create an unwieldy and inflexible management structure, when increased flexibility is the only way to respond quickly to changing needs?

The reasons that could justify building a permanent home for a new institution vary widely, and are closely tied to local circumstance. In countries or cities where public space has been eroded by commercialisation, road building, and changing demography, the new institution is an opportunity to create new urban social space. newMetropolis is a good example, where the building's roof has created a piazza where people can stroll, look at the city, and listen to concerts. In other locations, a showcase may be called for - a place where informal learning practices can be seen, engaged in, and discussed - for example the Anacostia Neighbourhood Museum⁴⁷, or the new Ars Electronica Centrum in Linz⁴⁸. In others, a building might be justified as a research centre, a place where communities of learners can work together to generate new knowledge. - and in some cases, real jobs, as at IDIS in Napoli. In all cases, it is essential to separate the challenges of building an institution, from those of making a building. Each has important, and sometimes sufficient reasons, however, the one does not justify the other. In fact, I would argue that the reasons to build new institutions far outnumber those to build a building to house an institution. Some important initiatives taken in recent years, CAST's children's science centre in Beijing, for instance, or the Science Alberta Foundation, have no permanent building, and instead appropriate other networks, and other buildings for their activities, such as research labs, daycare centres,

libraries, and hospitals. This in no way diminishes their effectiveness as institutions of informal learning.

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To conclude, the crisis can be summed up as follows: institutions such as science centres are expensive to create as capital projects, expensive to maintain with a professional staff, and, given the high costs of exhibit development, expensive to change. Lacking a fixed collection of unique artefacts with which to attract visitors, the science centre is at risk when it cannot change quickly enough to meet the demands of its users. In the past, temporary exhibitions have been used as a means of creating more frequent change. Now, however, given the exponential increase of the availability of new electronic media, such as home computers, CD-ROMs, and soon, interactive television, coupled with their massive interconnection via the Internet, the informal learning that once was the preserve of the science centre can now be had at home and in other sites, thus rendering the science centre unwieldy, expensive, irrelevant, and obsolete. In short, the science centre is faltering because, on the one hand unlike the museum, it has little that is truly local - nearly everything that can be found in one science centre can be found in almost any science centre - or on the Internet, and, on the other hand, the mission of the science centre no longer meets the needs of the world we are in the process of creating.

I do not want to end on a note of despair, however. When I wrote about the three generations of science centres in 1989, I described the need for a new kind of institution. The subsequent years have not proven me wrong. In fact, over the course of the past ten years we have seen an increasing number of institutions, some of them housed in new facilities, that point to the emergence of a new kind of institution of informal learning. Moreover, government, cities, and industry are all signalling that they are in desperate need of such an institution, both as an informal learning platform, and as a centre for research. Now, at the threshold of the twenty first century, I argue the emphasis is fully on creating a learning society, and how the learning process can be supported. A learning society needs new institutions of informal learning, and institutions like Science North in Sudbury, the Science Alberta Foundation, the Ars Electronica centrum in Linz, the ZKM in Karlsruhe, and newMetropolis in Amsterdam all represent a new approach to the challenge of creating public informal learning environments.

Where I was mistaken, was to see this new kind of institution as development of the science centre. We can easily imagine a world bereft of science centres - it is difficult to imagine a world without informal learning institutions. Instead I would now argue that a new - and independent - form of institution is evolving from a wide range of existing institutions, an institution in which the emphasis is on supporting self-initiated, self-directed, and self-sustained learning in an informal setting. Not a science centre, not a museum, not a library, this is a new hybrid institution - a new learning platform.

Before I continue, let me first define what I mean by informal, as opposed to formal, learning. The key feature that distinguishes the museum from the school, or more broadly, the informal setting from the formal one can be summarised succinctly in the words of Frank Oppenheimer, founder of the San Francisco Exploratorium, one of the first, and still one of the world's most innovative science centres. He said 'nobody ever failed a museum'. In a school, the student must be carefully modelled, in terms of prerequisite knowledge and abilities, and carefully evaluated, in order to ensure the coherent and standardised acquisition of knowledge. In a museum, the visitor is defined by the act of visiting - there are no pre-visit qualifications and no post-visit tests. Our visitors are unknown, and, perhaps more importantly, unknowable. In the formal system, the student is responsible for learning. In the informal system, the institution is responsible for creating learning opportunities. A student can fail a school- but only the museum can fail its visitors.

The two systems, although complementary, are like oil and water - they do not mix. The formality we speak of in the learning environment is not just a question of style - dusty classrooms and boring lectures versus interactive experiences and jolly good fun. An interactive programme set in the science centre, on whose success or failure a student passes or fails, remains a formal experience - even if it is not conducted in the classroom. On the other hand, an evening lecture series in a classroom, voluntarily entered into and unrelated to passing or failing, is informal, wherever it happens to take place. Even though they often work in consort, and are both concerned with education, the formal and informal systems are distinct, independent, and parallel. The formal system thinks in terms of students, the informal system, in terms of learners.

Why do these differences matter? What can the informal system offer that the formal system cannot? After all, it is often argued that in order to achieve its goals, all that is needed is more education, more hardware in the classroom, and more software to run on it. Following this logic European governments should pour more money into the formal education system, not the informal one. What makes the informal sector worth the investment? The informal environment is a prime site for learning about learning, and learning to learn, and I would argue that new learning platforms offer two key features - research, and reach.

First of all, research - our informal learning institutions are potentially powerhouses of learning about learning. Only the informal environment can provide governments with proof of the effectiveness of new strategies to stimulate learning. On the one hand, if thousands of students go to classes every day, this does not demonstrate either the attractiveness nor the effectiveness of the learning environment provided by the schools. Students go to school because they have to go to school. On the other hand, thousands of users daily 'vote with their feet' and pay to engage in unforced learning - and as long as we can ensure that learning occurs in the centre, then learning it is, even if it is perceived by the visitor to be fun. When our learning environments attract users it is evidence for their ability to stimulate and structure self-initiated, self-directed, and self-sustained learning. When they don't, our failure is public and painful. Success in attracting users is not enough, however. Michael Shortland's famous question of 1988 still obtains - 'but are they learning?'⁴⁹ Although there is still substantial debate, there is now evidence that certain interpretive strategies can promote learning⁵⁰. If users come to our programmes (proving their attractiveness), and they can be shown to learn (proving their effectiveness), then we can argue that we can have knowledge about motivation and effectiveness that can be transferred into the formal setting. If the knowledge we create in the informal setting can be transferred to the formal environment, then we have not only proven the worth of the informal environment, but enriched the formal environment as well.

Second, reach - the informal system potentially provides a means to catch the increasing number of people outside of the formal system - dropouts, the unemployed, the elderly, and ethnic minorities. Because the informal system is by definition not restrictive, a broader spectrum of the public can find an opportunity to learn in the museum than in the school. Because it is concerned with learners not students, the museum can create a wide range of different learning opportunities for a broad number of people. This reach is of enormous importance to the European economy in the coming decades. As global finance and new technologies change the face of the working world, and people have to adjust rapidly to changes in the workplace, the informal learning environment becomes an important place to learn new skills - not only the skills involved in new technologies, but skills of communication, collaboration, and discussion. This socialisation has often been associated narrowly with the formal environment⁵¹, but is increasingly a feature of the informal learning environment, as the museum takes on the forum function in modern society. Whereas the formal system sees its success in terms of more students, the informal system succeeds in terms of more learners. To compete in the next century, We need a more learners, not just more students.

So what characterises this new institutional form we see emerging? Our museums and science centres must change if they are to meet the challenges of the next century, and the key to that change is the embracing of new technologies that make many-to-many communication easier and more effective. I want to leave you with some possible strategies that will help guide our institutions in the next century.

The next generation of new learning platforms are not defined by their physical setting. They do not even need to have their own buildings. Our new institutions of informal learning - whatever their roots - will be characterised by the following features:

- **skills not information.** The new learning platforms must stress the acquisition of new skills, not just information. These skills are largely shared by art, science, and technology alike - creativity, collaboration, abstraction, thinking in terms of systems. The common ground provided by putting the accent on skills has the effect of making less important the distinctions formerly made according to content - science, ethnology, history, fine arts. Of course information is still indispensable, but it must be linked to the skills of finding, using, and appropriating that information. The new learning platforms recall the humanist education of the Renaissance, and prepare the learner for all fields of endeavour. As Jonathan Miller once said, they 'prepare us for a world in which the life of the mind is a pleasure.'

- **turn visitors into users** - the value of the new learning platform is created by use. Our institutions of informal learning must not be satisfied with the casual visit, nor driven by the single-minded goal to increase the numbers of visitors through the turnstiles. The new learning platforms must draw lessons from the library, not only the theme park, and provide experiences that satisfy the full range of interests and expectations. A library is not judged by the number of tourists that visit, nor by the blockbuster appeal of its presentations. The new learning platform must create its base in the community, work with its local community to expand that base, and encourage repeat visits - real or virtual.

- **high value, not high volume** - our institutions must focus on creating a high value informal learning environment in all respects, and for all its users. This means exploiting the specific strengths of all the media - real things for their immediacy and specificity, public space for its conviviality, computers for their ability to engage the player, Internet for its access to global resources of both information and interaction. Exhibitions like Mine Games have shown that computer games are an effective way to create what Cziksenmihalyi calls the 'flow' experience⁵². Institutions like the Laboratorio dell'Immaginario Scientifico have shown the tremendous potential for creating linked group learning activities via the Internet. Institutions like ArsLab have shown the effectiveness of temporary manifestations. It is not the medium that matters most - what matters is that the quality and duration of the user's engagement is maximised⁵³.

- **research and knowledge transfer** - a fundamental part of a new institution's mission is to generate new knowledge about informal learning, and turn it into effective new tools for teacher training. This is a role that only a new kind of institution can play. By definition, informal learning is learning sought for its own sake - it must be self-initiated, self-directed, and above all, self-sustaining. Traditional, school-based educational research is unable to investigate these questions, as they have little or no access to a public environment in which learning is unforced. Publishers, on the other hand, are not geared to take risks in creating new educational tools, and lack the means of adequately testing their products prior to release. Only a public informal learning environment, with a stream of uncoerced users, can provide the research setting necessary to create the tools and the training so desperately needed by the schools, and by society⁵⁴.

- **think global, act local** - a new learning platform must place its emphasis on what is unique to its specific locality - on what cannot be found or done somewhere else. It must put a premium on local culture, local practices, local experience. It must be firmly rooted in its local conditions, and use them to build a community commitment

to the institution. In past decades, exhibits could not effectively be shared, so they had to be duplicated. However, the new media and the Internet now allow our institutions to put the emphasis on local circumstance and local culture for the physical site⁵⁵ - and global culture and global circumstance for the virtual site. Global information networks allow for the first time real, virtual institutions, open to visits from around the world, and to real-time participation. This participation need not be limited to the Web site itself. Exhibits can be designed that can be actively enjoyed by international virtual participants, as well as local users, and the participation of the virtual community can actively change the state of the local activity, much as an earthquake in Tokyo can shake the market in New York. By exploiting the new media the physical scale of the institution can be tailored to local circumstances. The institution does not have to be a major capital project - unless circumstances demand it. It can be a rented storefront, a community hall, a borrowed lab - any space can be appropriated to become the kind of institution needed by the community.

To conclude, it is important to emphasise the fact that the key to the survival of our institutions of informal learning - both as institutions, and as real places - is in having the flexibility to respond to the needs of a wide variety of users.

An exhibit in the newly opened Ars Electronica Centre in Linz is a perfect example of the direction I believe our institutions must take if they are to survive. It is not the virtual reality cave, nor the myriad interactive computer exhibits. It is the virtual garden. In Linz there is a real garden, with real earth and real plants that grow in the real, local, Austrian sunshine. But this is a garden with a difference. It is planted, watered, and tended, by a growing number of virtual gardeners via the Internet. This group not only tend their own plants, but of course now communicate with each other - forming a virtual community. However, unlike most virtual communities on the Internet, such as newsgroups, this community's common object is real, and local. The garden is, in a sense, the real consequence of a virtual world, a reality shaped and tended by a real group of caring gardeners. It is not difficult to extrapolate from this experience to the possibility of exhibit experiences being created in local environments but shaped by a global community of learners, each contributing, and each being rewarded for his contribution. This kind of exhibit holds out the promise of realising many of the approaches described above - it is local and global, it is user-driven, it transforms visitors into users, it is profoundly social and open to change. By turning our efforts to this kind of approach, the science centre itself becomes a kind of virtual garden, wherein we all can play the part of gardeners.

Thus our institutions should take the initiative in developing new products and programmes with new media. As specialists in the informal environment we are well

positioned to take a leading role in creating new approaches to informal learning, and new knowledge about how to support learning. We may not be alone in the field, nor should we be, but the new institution's future is guaranteed as long as we continue to take the initiative in creating rich learning opportunities - inside and outside, with and without our walls.

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[7837 words]

The museum time bomb Overbuilt, overtraded, overdrawn

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ABSTRACT

For the past three decades, North America and Europe have experienced a massive explosion in the growth of the museum sector. Cities clamour to build new institutions designed by ‘signature architects’, and new museums are claimed to be the secret to economic and urban renewal. This paper argues that the reverse is in fact true. The market for museums is over saturated, and the resulting bubble is unsustainable and set to collapse. In particular, this paper argues that in overbuilding, the museum is forced to over-trade, thereby compromising its institutional mission. In order to create new markets for its services, the museum is obliged to move away from its traditional role as a supplement to formal education, into the role of either a provider of remedial education, or that of competing in the leisure sector against films, television and events. Providing remedial education entails greatly increased costs, without a convincing increase in effectiveness, calling into question the museum’s claim to be supported as part of the educational system. On the other hand, if educational goals are sacrificed in order to compete as entertainment with other ‘leisure activities’, the museum’s high operating costs make it uncompetitive, and the museum is only saved from bankruptcy by continuous infusions of tax revenue. The current demographic and political trends would suggest that this form of support – and hence the museum itself – is not sustainable in its current form. The answer would seem to lie in a freeze on new museum building, a consolidation of existing institutions, and a return to the museum’s core values.

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INTRODUCTION

The past three decades have seen a huge museum building boom in Western Europe and America. Combined with an emphasis on so-called ‘blockbuster’ exhibitions, museums are popular as never before. Visitors stand in queues for hours in order to pass a few minutes shuffling in front of old master paintings or experience an epiphany

in a seconds-long encounter with the Impressionists, and some museums have been obliged to stay open ‘round the clock’ to meet the demand. More than ever, museum attendance is seen as an indispensable feature in a modern lifestyle. The statistics reflect the giddy heights to which the numbers of museum visits have soared, and overall the number of people visiting museums has increased substantially during the past decade. Nevertheless, there are signs that these rosy statistics mask a troubling decline in visits to middle-aged, middle-sized institutions, who are often unable to generate the exhibitions said to be necessary to keep the visitor’s appetite for novelty whetted. Moreover, regardless of size or location, there are widespread problems caused by falling museum income as the public sector reduces its commitment to museums, and the private sector fails to support core museum activities. When funding is available, it is often a one-time investment linked to new museum building – a ‘poison pill’ that leaves museums with higher future operating costs but no guarantee of future revenue. In Britain, where lottery funds were extensively used to fuel the museum building craze, the first of the lottery-funded projects are in financial trouble already, and some are already considering closing. There is a time bomb in making as scores of new museum projects are poised to go bankrupt during the coming decades. Their collapse will put a massive burden on the public purse if they are to be saved, or expose them and the communities that they support to major disruptions as they are closed or converted to new uses. What is happening to the museum field? Is the museum boom sustainable? Can museums continue to fulfil their mission and still survive in a time when public and private priorities are changing rapidly?

Since its earliest history, in addition to its role as the collector and preserver of material culture, the museum has been seen to perform two other significant roles, that of education, and that of leisure. The importance of these roles has varied significantly in emphasis over the past two centuries, and both models have an excellent pedigree. However, given the polarisation of these two roles in the years after WWII, arguments for funding have often been linked to the degree to which the museum delivers value as education or as leisure activity. In principle, public money – the widow’s taxes – supports public education, while the private sector – most commonly the individual user – pays for private pleasure. Traditionally in Europe the museum has been funded almost entirely from the public purse as a scholarly resource on the one hand (akin to support for the university as a site for the production of new knowledge) and as a site of public education on the other. In America, where the bias has been towards private or charitable funding, the museum has been financed primarily as a leisure activity, a public platform for the educated flâneur. Unfortunately, while the terms leisure and education remain the same, the definition of the scope and expectations associated with them has undergone drastic revision in the past forty years. As a consequence, the museums are caught rather uncomfortably on the sharp horns of a funding dilemma.

On the one hand, museums that have pursued their traditional educational mission have found that the education they are now expected to provide is increasingly ‘remedial’ – directed at filling gaps in the basic education of an increasingly broad spectrum of users. Increasingly, public funding for museums is tied to meeting specific targets aimed at addressing issues of social inclusion. At the same time, confronted by data that show how limited museums are in providing primary education, the public purse is questioning its return on investment – museums are just too expensive to operate for the relatively brief educational encounter enjoyed (or not) by most users. The cost per visitor of a four-hour visit per year (if the museum is lucky) is out of proportion to the results of a similar investment in the classroom or in the media.

On the other hand, those museums who followed the call to join the ‘leisure industry’, and provide entertainment – even ‘edutainment’ – are now also threatened. Public authorities are understandably reluctant to fund entertainment – in their opinion a frivolous private experience. In order to increase visitor numbers, and thereby revenue, museums are forced further and further ‘down market’. First conceived as an encyclopaedia, the museum has increasingly become a 3-D walkthrough documentary. From the documentary it is but a short step to the Hollywood-style blockbuster. At the same time, even blockbuster exhibitions do not benefit from sufficient economies of scale to enable museums to ‘sell’ the museum experience at a price the public is willing to pay. The value-for-money of the museum as entertainment is unfortunately relatively low, while the costs are substantial. Whereas a Walt Disney visit or a Hollywood film enjoy economies of scale whereby they can be expected to pay for themselves from revenue, few museums break even with exhibitions – even fewer when all the overheads are taken into account.

This paper explores both paths the museums have followed in the past decades, education and entertainment, and suggests that they are both dead ends. What is called for is a reassertion of the core values of the museum, and a reaffirmation of its core competences. Only then can the appropriate funding model – sufficient and sustainable – be identified.

To start we must first consider the museum’s mission.

THE MUSEUM MISSION

In an earlier and less complicated time, Joseph Veach Noble (then Head of Education at the Metropolitan Museum of Art and later to become President of the American

Association of Museums) wrote that the purpose of the museum is ‘to collect, to conserve, to study, to interpret and to exhibit.’ These, he said, ‘are like the five fingers of a hand, each independent, but united for a common purpose.’

If one defines the museum largely as the first three fingers of the hand, its history is linked to that of the collection, and the museum has its roots in the Classical past. The earliest museum of which we can speak was actually a library: the ‘mousseion’ of Alexandria, the institutional sibling of the famous library that flourished three centuries before Christ. Since the Renaissance, the dominant model of the museum has been the collection, and the demands of the collection have taken precedence in the museum’s organisation. If one puts the emphasis on the last two fingers, the museum’s history can be traced to the late 18th century. By the end of the 18th century, the political situation was extremely volatile, and the demands for access to social, political and cultural machinery found decisive political expression. Following the French Revolution in 1789, the very existence of private collections was called into question. Out of the passionate defence of the need for collections to the Convention of 1793 and 1794, the first modern museums were born: the Louvre, the Museum de l’Histoire naturelle, and the Musée des arts et métiers.

Regardless of which of the fingers is emphasised, it is clear that much of the museum’s core mission – and its core values – have to do with preserving the traces of culture over the very long term. Moreover, since the French Revolution, museums have been seen as a resource to supplement the formal education system. Now, forced increasingly to position themselves as exhibition halls, museums are being exhorted to become an extension of the ‘leisure industry’ – on the assumption that entertainment, after all, should be self-financing. Alternatively, museums are being pressured to play an active and activist role in redressing social and economic inequalities. This repositioning raises some fundamental questions.

IS THE MUSEUM ENTERTAINMENT?

First of all, is the museum really part of the ‘leisure industry’? The assumptions that underlie this assertion are two-fold. First, that museums have a product, something that is made in some kind of quasi-industrial process, and second, that as part of an industry, we are only one of a multitude of other producers of similar goods – in this case, something called ‘leisure’ or ‘recreation’. We thereby unwittingly end up as soulmates with electronic games, swimming, going to the cinema, and curling up with a good book. I would argue that it is very difficult to define the museum ‘product’ – is it enjoyment? Learning? Enlightenment? and even harder to define the process

whereby museums create the product – our objects? Our labels? Our cafés? Is it all just ‘leisure’? Second, if the museum is in fact competing for the precious discretionary time of the visitor, with whom is the museum competing and for what? Competition only realistically can be said to exist if there are limited resources and real choices. If I have only ten dollars (or Euro), I must choose how to spend it. The more wealth I have, the less choices come into conflict – the less they compete. If I can buy a watch, a diamond ring, and fly to New York for the weekend, where is the competition? Competition also assumes that products or services are interchangeable, and are distinguished only by cost, quality, and occasional intangibles. I can choose between Garrard and Cartier when I buy a diamond ring – they are in competition. I can choose to fly to New York with Virgin or with Air Pakistan – they are in competition. But when a product or service is irreplaceable, where is the competition? When a unique Stradivarius comes on the market at Christie’s, or if I want Luciano Pavarotti to sing Ave Maria at my wedding, competition disappears. Where does the museum fit in all this? Do museum visitors have so little discretionary time that the museum must compete for it with ever bigger, ever flashier exhibitions? Are all museums somehow equal, and therefore in competition? I would argue that the answer is no on both counts.

The logic of competition only holds if we imagine our visitors as a limited amount of time to spend, and little chance to return – if we think our visitors are tourists. In this case, the logic of the market prevails. If you only have three days and eighty possible museums to choose from, even the case-hardened cultural tourist will be able to tackle no more than a dozen of them. But does placing our emphasis on the occasional tourist visitor – at the cost of treating the regular local user like a tourist – make sense? Does it help us build better museums, richer informal learning environments, activities that require engagement, commitment, continuity? I would argue strongly that as museum professionals we must stop thinking in terms of visitors and instead think in terms of users – repeat visitors who can learn the skills necessary to truly take advantage of the rich environments we provide. Of course it is not a case of either/or, however, for too long the discourse has been dominated by those who see everything in terms of the one-time, occasional visit.

There is a signal difference between the cultures of Europe and North America in the discussion about competition. In nearly all aspects of museum work, the dialogue has been shaped by North American concerns, concerns arising largely from a pioneer culture which only sees individuals, at the expense of occulting all forms of social behaviour. Competition is seen as a function of individual choices, and between isolated institutions. But surely one of the lessons of museums is that museum-going as a cultural practice is often as much social as individual – people come to discuss

their experiences, to compare notes, to be with friends. It follows then that choices about museum-going are often choices made with others – with family, friends, groups – which makes it even more likely that it is the practice that is endorsed, not the individual museum. Only if we are blinded by the rhetoric of the marketplace, in which individual choices are made by individual actors, can we make the mistake of thinking our museums truly compete for their individual leisure time.

HOW EDUCATIONAL IS THE MUSEUM?

So if the museum is not to be defined as part of the ‘leisure industry’, in which it would find itself playing – and losing – by the rules of the entertainment market, where should it belong? Museum expert Kenneth Hudson was intolerant of museums that shamelessly took advantage the generosity of the public purse by not taking seriously their mission to serve the public. A museum had to be paid for – and money didn’t just fall from the sky. ‘A museum has to have money in order to survive. And where is that money going to come from? The money will come, directly or indirectly, from the people who come to see the museums.⁵⁶’ Or put another way, ‘It comes from the taxes paid by poor widows⁵⁷’. But if not entertainment, surely the museum can make a claim on the widows’ taxes as a legitimate and traditional part of the national education system.

One of the first public museums, the Musée français, (later called the Musée du Louvre), was a creation of the Convention of 1793, and was originally the repository of the fruits of the confiscation of works of art from the church and the aristocracy during the Revolution. Under the Directoire, the museum’s collections were organised systematically according to ‘schools’, and most importantly, explanatory texts were placed with each artwork. In addition to explanatory texts, the Louvre, following its initial vocation as ‘the people’s museum’, was open to the public free of charge, published a guide for visitors and sold an inexpensive catalogue. The Museum de l’Histoire naturelle was created primarily from the Cabinet du roi and the Jardin des plantes by the Convention of 1794. Lamarck was outspoken about the needs of those who were excluded from the cabinets, and went on to enunciate one of the fundamental principles of the modern museum: public admission - ‘the museum should not only be open to the public during the afternoon, that is to say during the hours when passers-by and idle folk seek some relief from boredom; but during the morning as well, that time of the day so particularly intended for travail, above all in investigations relative to the sciences.’

Thus the arguments for founding museums were linked to their ability to teach new skills - not just convey information about the distant past or amuse idle time-wasters. Justifying the creation of the Musée des arts et métiers, arguably one of the first museums of applied arts, the Abbé Gregoire summarised his proposal to the Convention by saying 'I have just disclosed to you the means of developing the national industry.' The educational objectives of the Conservatory were clear from the outset - faced with a substantial delay in catching up with English industry, apprentices were to be routinely brought to the Conservatory to study machines and working models of machines, in order to make up the French deficit in technology speedily. Moreover, the Conservatory became the depot of record for all inventions patented in France, the repository of the history of France's entry into the industrial world. The Convention was convinced, and the Conservatoire des arts et métiers in Paris was created on September 26th, 1794.

Since at least the heady days of the Convention, the museum has had an explicit educational mission. The museum was an integral part of social, cultural and economic policy, and was intended to provide the opportunity for a broad public to participate in the cultural capital of the growing state. The museum's collections were at once an act of preservation, and an investment in the future. Adjuncts to the formal education system of schools and universities, the museum's collections were a resource to be used by students, scholars and amateurs alike. In this respect, the nature of the museum's educational mission not really changed significantly over the past centuries, and the museum's mission is still to excite, inspire and enlighten the minds of its users.

WHAT EDUCATION FOR WHOM?

What has changed dramatically in the post war decades, however, are the assumptions about the nature of the education that the museum is expected to provide, and the audience to whom it will be provided. On the one hand, under the pressure by interests on both left and right of the political spectrum to increase access to a much broader spectrum of society than that assumed by museum founders, museums are increasingly confronted with visitors whose ability to take advantage of the museum as an educational resource is limited. On the other hand, however, in claiming to be an educational resource, rather than a feature on the entertainment landscape, the museum is confronted by a dilemma. Can it remain haughty and aloof from the obvious needs of its new visitors for new information – ever the ivory tower? If so, how can it justify its generous subsidy from the public purse? In many Western countries the government subsidy is now tied directly to the museum's ability to serve 'under-served' audiences. Or does it resign itself to accepting the role of offering remedial education to those

who are not able to enjoy the museum's collections? The shift in the museum's educational priorities has been from supplementary education, whereby the museum serving as a resource, to remedial education, whereby the museum teaches the skills necessary to understand its collections.

Perhaps an illustration will help understand the importance of this shift. Let us take as the library as our example. Its mission is relatively stable, and in many regards it is similar to the traditional museum. The library collects, preserves, studies and occasionally interprets its collections. Unlike the museum, however, books are rarely displayed for the purpose of exhibition, instead, it is expected that they be arranged and organised in order to help those who can read them. People rarely go to a library just to look around, nor do they exclaim 'nice-looking books. I love books!' The library is a different kind of institution, but like the museum it supports learning about the world and understanding the culture in which we live. In fact, many things that one does in libraries we would love to have people doing in our museums. But we have a very different model – libraries think in terms of users, whereas museums most commonly conceive of their public in terms of visitors. What would happen if the library responded to financial and economic pressure in the same way as the museum in the past decades?

Imagine the following. A library has low but stable numbers of users, a loyal group of locals who come regularly to the library to read, browse and borrow. Under pressure from the public administration to ensure greater accessibility and attract new audiences, the library administration decides to put its books of Greek poetry on display in a special exhibition, Greece having newly joined the European Union. Visitors come, drawn by the rarity of the books and their expensive bindings, richly tooled in gold and jewels. Further exhibitions are mounted, featuring even costlier and rarer books. Few visitors, however, read Greek. The library's education department protests against the static book displays, unreadable by the majority of the library's new visitors, and develop new 'hands-on' experiences to introduce visitors to the basics of the Greek alphabet. Seeing the success of the experiment (children drawing Greek-looking squiggles, adults discussing olive oil), the library decides to create a new IMAX theatre experience on the joys of Greek culture, necessitating the removal of the library's book collections. Given the crowds that come to the IMAX theatre (designed by a famous Greek architect), the reading rooms are closed to make way for visitor parking...⁵⁸

Although rarely commented upon, the shift in emphasis – and in mission – has important consequences. In the library example above, instead of being a resource for users to supplement their self-initiated and self-directed enquiries, it has become a

place for visitors to be entertained and (perhaps) instructed. The library is no longer a place for readers, it is a place for non-readers. On the one hand, if we accept that the library (or museum) is a place for entertainment, for ‘flânerie’, then there is no reason why the institution should not compete on its own terms in the entertainment market. Why should it receive a subsidy from the state? Or in Kenneth Hudson’s words, why should the institution be financed from widows’ taxes? On the other hand, if we argue that the institution is a site for education in any meaningful sense, then we are forced to weigh the costs of providing that education (both in terms of one time capital costs and operating costs) and its effectiveness. This is where the change in the nature of the educational experience begins to matter. As a resource the library can be justified in terms of its use to readers. However, as an instrument of remedial education – a place in which one learns to read – it is clear that the few hours a year spent in the library could in no way justify the large capital investment and the high operating costs. It is even to be strongly doubted whether the library could – or should – play such a role at all. With little effort, it can be seen that the same argument applies to the museum.

THE COST OF CHASING VISITORS

Notwithstanding the importance of the ‘affective’ or emotional impact of the museum visit⁵⁹, several museum visitor studies suggest that most museum visitors come three times in a lifetime⁶⁰ – as a child (often in a school class), as a young parent, and as a grandparent⁶¹. This general pattern is of course mitigated to some extent by what the tourist industry calls VFF – Visiting Family and Friends – so when your sister-in-law drops in with the kids, or your school chums passes through town for the weekend, a trip to the museum might be the perfect way to spend a rainy Sunday afternoon. Whilst it is true that schoolchildren often come more frequently, depending on the museum’s outreach programmes, these visits are often compulsory, and cannot be credited to the museum’s attraction as an informal setting. However, notwithstanding VFF, and school visits, this three-visit pattern tends to force the museum to create temporary exhibitions as a means of generating repeat visits. In fact, the modern temporary exhibition is a creature born out of a desire to increase the number of visitors. In the 70s the great ‘blockbuster’ exhibitions such as King Tut proved that the exhibition could also be a major money-earner, as well as a sure generator of extra visitors. However, without change to generate repeat visits, or an influx of new visitors, the number of visits inevitably declines. The museum’s allure is increasingly that of a stadium – people only visit to see a specific event. Paradoxically, however, increased visitor numbers impair the ability to deliver the high quality engagement that is at the heart of the museum experience. Large numbers of visitors shorten and

degrade every individual's ability to engage with the exhibits, and, when international tourists make up the bulk of the visitors, the local community is squeezed out almost entirely⁶². And, if the museum expands to meet the increased demand, it incurs increased operating costs that only make the problem worse. The museum – an unwieldy beast at best – ends up being unable to feed its increasingly heavy bulk.

To increase their earned revenue, many museums have increased their reliance on tourist visits. The Louvre estimates that over 70% of its visitors are international tourists, the Van Gogh Museum, over 80%. But building a financial strategy on one-time tourist visits comes at a high price – that of vulnerability. During the IRA attacks in London in the 80s, tourist visits to London museums plummeted, and the attacks on the World Trade Center on September 11th highlighted the vulnerability of the museum to shifts in tourist behaviour. Celestine Bohlen reported on the dramatic impact of September 11th on New York's Guggenheim Museum.

“the hard times have come to the Guggenheim Museum on Fifth Avenue, and like the good times before them, they have hit big. Admissions are down by almost 60 percent, revenue is running about half of what it is supposed to be, and as of Friday 80 employees – roughly one-fifth of the staff – had been given pink slips in what Mr. Krens described as the initial round of layoffs. Besides the staff cuts, which reportedly may reach 40 percent, the museum has scaled back its exhibit schedule, postponing exhibitions by Matthew Barney and Kasimir Malevich. Its SoHo museum on Prince Street will close at the end of the year, and the fate of its \$20 million Web site, guggenheim.com, is still unclear. [...] Ever the showman, [the Guggenheim's Director] Mr. Krens has now cast himself as a model of fiscal responsibility. “I think it is appropriate for an institute to re-examine its core mission,” he said. [...] But that has also made the Guggenheim more vulnerable to the fickle tides of New York tourism. Of the museum's one million visitors a year, almost 70 percent are from out of town, and 50 percent are from abroad, Mr. Krens said. In addition the Guggenheim is more reliant than most museums on admission fees, which account for 25 percent of total revenue, compared with 12 percent at the Metropolitan Museum of Art. Its critics see this as a weakness in his management approach. “They were forced into being a cash machine,” said one director of a New York museum who asked not to be identified because he did not want to be seen as criticizing a rival.⁶³

This is the crisis many museums are now facing. Having built a financial strategy based on attracting one-time visits – mostly tourists – by creating spectacular ‘blockbuster’ exhibitions, the museums have created an expectation of museum-visiting that turns the museum into a stadium. As a consequence, the museum is forced

on the one hand to continue to mount expensive temporary exhibitions that eclipse interest in their permanent collections, while on the other hand they remain vulnerable to influences on visitor behaviour – from changes in taste to terrorist attacks. The core mission of the museum – to collect, preserve, study, interpret and exhibit its own collections – is rendered secondary to the imperatives of bringing in the crowds. The tail is now wagging the dog.

PIAZZA OR STADIUM?

We have seen above how the model of the stadium – event-driven, one-time, short-term – acts in the long term to reduce real use of the museum. What other models could we look to? What other social spaces offer a model for repeat use by a broad spectrum of the public?

From its earliest beginnings, the model of the library has also been part of the museum's history. In many respects, the library model offers far more opportunities. A library is local, rooted to its community of users – and global, in terms of the resources it makes available. As a resource centre, it can service its users in a wide variety of ways. A library is not exhausted by a visit; on the contrary, it is refreshed by it. Europe also has a long tradition of public places, and the model of the Italian piazza springs readily to mind. A piazza is defined by the variety of possibilities it offers, by the range of possible activities, and by its use by young and old. The use of a piazza is entirely 'bottom-up'. You can sit in the sun and drink a coffee, talk to your friends, play with your grandchildren, window shop – everything is possible in a piazza.

Like the library and the piazza, the museum always had an important social role. We know from the research of Marilyn Hood⁶⁴ and others that for the majority of museum visitors, it is precisely this public physical space that is one of the central motivations for visiting. The majority of museum visitors come in groups, and the museum space is not only a social space - a place where people meet and mingle - but a socialising space - a place where they learn the skills of public interaction. If the street is 'a room by agreement', as Louis Kahn once said⁶⁵, surely the museum is a house by agreement. A museum can also be seen – and developed – as a special kind of piazza. But to function as a piazza it must also enlarge the range of activities it offers, and be prepared to see the experience of its own collections as only a part of a social activity that also includes eating, drinking, talking, and shopping. The collections must be developed to create a sort of intellectual 'park' in which users can wander in a landscape of objects and ideas. Research has amply demonstrated that the majority of museum visitors come for – and remember best – the social interaction of the visit. It

follows therefore that a museum must strive to increase the number of opportunities for a rich and varied social experience. The more a museum defines itself as a piazza, the greater the number and the greater the variety of its users.

THE NUMBERS GAME

But is the key to success – and its measure – only to be found in increased visitor numbers? Unfortunately, museums and their Directors have often accepted uncritically the American rhetoric about the museum mission, and, as a consequence, have accepted the argument that the museum’s future depends on ever increasing visitor numbers. Museums, Kenneth Hudson once said ruefully, ‘have become victims of the equation, better = more, and they have adopted policies which they believe could bring them the extra visitors which... their employers are driving them to find. They dare not wonder whether going for popular appeal will lessen or even destroy quality⁶⁶.’ This new popularity – or at least increased visitor numbers – in turn depends upon blockbuster exhibitions, and increasingly on new museum building. Over the past three decades, museum buildings – not the museums and their collections – have become the means by which museums compete with one another for tourist visits⁶⁷. This logic is clearly spelled out in a recent article about the Victoria and Albert Museum’s expansion plans in the New York Times. Here it is suggested that the failing visitor numbers are the consequence of the museum’s collections (the best in the world) and the remedy in a new extension by a ‘signature architect’.

“In 1991 the National Gallery opened a new wing on Trafalgar Square. More recently, thanks to profits from a national lottery, the Tate Modern rose out of a former power plant on the Thames; the British Museum created a bright, covered courtyard at its heart; and the National Portrait Gallery was enlarged. Yet when the V&A sought lottery funds for a modern extension designed by Daniel Libeskind, the architect of the acclaimed Jewish Museum in Berlin, it was rebuffed. The V&A was in a funk. A shortfall in government grants had forced it to start charging entrance fees in 1996, but the resulting drop in attendance – to below one million visitors a year – hurt its image. The modernization of other museums also highlighted the antiquated presentation of its eclectic collections. Further, as museums full of paintings drew record crowds to blockbuster shows, it was clearer than ever that decorative arts lacked the pulling power of, say, Rembrandt or Monet.⁶⁸

In his article on the museum dilemma, Alan Riding drives the point home:

“Is it any wonder, by the way, that museums therefore came to view architecture as a solution to their problems? Architects naturally wanted to build the new cathedrals, but museums wanted architects too, partly because just about the only aspect of the museum over which institutional authority had not yet totally eroded was the outside of the building. The popularity of the Tate Modern last year proved that the impact of spectacular architecture can pretty much drown out even the most substantial complaints about exhibitions and collections. Bilbao has become the ultimate dream of museum entrepreneurs. You don’t even need a collection. You can borrow one. The goals are now civic luster and economic improvement – decent goals but, aside from the aesthetics of the building itself, not artistic ones. The hollow shell has become an operative metaphor for newly skewed priorities.”⁶⁹

What is clear, however, is that with certain notable exceptions such as the Centre Pompidou, the visitor numbers generated by new buildings start to drop off after the third year – the well-documented ‘S’-curve, and in the case of some museums, the drop in visitor numbers can be vertiginous⁷⁰. At the same time, new buildings often bring substantially increased operating costs in terms of overhead, maintenance, and staff. Increased operating costs combined with drastically reduced visitor revenue can injure – or even kill – a new institution⁷¹, and paralyse an older one⁷². Following its billion-dollar expansion, the Louvre, for example, is forced to keep over 25% of its collections closed to the public due to the high cost of extra staff⁷³.

Nor is building new museums in and of itself is the answer to revitalising a city or a neighbourhood. A new museum building will bring visitors to an area on a one-time basis, generating interest that generally peaks after three years, depending on the size of the potential visitor pool. If the operational costs of the museum are not adequately funded in the long term, new museum building is urban suicide. Even the Bilbao effect – once a byword for urban regeneration – will soon be a symbol of the failure of short term urban planning. The once full flights are even now fewer, cancelled for lack of interest in seeing the same exhibitions that the international visitor has already seen in New York, Berlin or Venice. Those who wished to see Gehry’s architectural wonder have largely done so. What will remain is a forlorn outpost of the McGuggenheim, its titanium petals rusting in the Spanish sun, its exhibition halls empty⁷⁴.

The museum I currently direct is a good example of the short-sightedness of museum building without considering its long-term sustainability. For the first few years, the Museum für Kunsthandwerk (as it was called from 1935 – 2000) basked in the sun of public attention due to its world-renowned Richard Meier architecture. The visitors came in droves, from both Frankfurt and abroad, largely to see the new building – an

architectural landmark. The Director responsible for guiding Meier's work retired in 1987. By 1989, with the only change being in the form of temporary exhibitions, visitor numbers had fallen predictably (following the 'S'–curve), although the quality of the Museum's exhibitions continued to draw a loyal local following. Unfortunately, in 1994, the City began to feel the pinch of their generous support of the cultural sector (at its peak, Frankfurt's cultural budget exceeded the cultural budget for all of Holland). Abruptly the money supply was turned off. Exhibition projects went unfunded, positions went unfilled, building maintenance went undone. For the first time, Frankfurt's museums had to charge admission, but this brought in no more than 10% of the amount slashed from the budget, and as a consequence the visitor numbers halved again. Not surprisingly, given the double impact of diminishing value and increased prices, visitor numbers plummeted. To this date, the museum has no City budget for exhibitions, education, publications, or publicity⁷⁵.

BUILDING A TIME BOMB

Unfortunately, the tyranny of the 'S' curve means regular crises due to the novelty wearing off. Exhibitions create an 'S' curve in the year's visitor patterns, new building creates a longer-term problem. The truth appears to be that the market for new museums is largely saturated, and new building only temporarily masks an overall decline in museum use. Despite rising wages and standard of living, which continue to swell the ranks of the middle classes able to afford museum visits, the pool of regular museum visitors seems to be growing slowly if at all. Moreover, despite the large numbers of visitors, they are not spread equally over all museums, but tend to favour the larger museums located in major tourist meccas. Even they are not exempt, as Alan Riding reported,

“a report by the Cour des Comptes, France's equivalent of the General Accounting Office, painted a still darker picture of the Louvre's management problems. The report, which is still unpublished, was leaked to a newspaper. Although it covered 1993–2000, it described a situation – financial difficulties, gallery closings and lack of autonomy – that was aggravated last year by a strike that closed the museum for three weeks and by a drop in tourism after the Sept. 11 terrorist attacks. The number of visitors to the museum fell to 5.2 million last year from 6 million in 2000. Some of the museum's problems are actually the results of success. The \$1.1 billion spent by the government over the last 15 years on building I. M. Pei's glass pyramid for the museum and on expanding and renovating gallery space more than doubled the Louvre's number of annual

visitors. But the museum's budget, staff and management structure did not keep up."⁷⁶

Operating costs are at the heart of the museum time bomb. The capital costs of new buildings are substantial, and it is a rare project that is not overbudget. These costs, however, are normally paid for by one-time contributions from private donors, sponsors, or the state. In Britain, dozens of projects have been financed in the past years by means of the Lottery Fund. However, large buildings require larger staff, and incur substantially higher operating costs. These costs are rarely, if ever, taken into consideration by private or civic funders – on the contrary, the Lottery Fund expressly excludes operating subsidies from its grants. This means that institutions are required to demonstrate that the increased operating costs will be paid for by revenue. Most new institutions (and many older ones) argue optimistically that this increased revenue will be supplied by the increased visitor numbers that stream into the newly built institution. Unfortunately, museum work suffers from 'Baumol's disease', whereby increased use of technology does not bring with it a corresponding increase in productivity (most public sector work is afflicted). This means that as wages increase to keep up with inflation, the museum's operating costs become inexorably more expensive. This is not a case of public sector inefficiency, just economics.

As seen from the above, the evidence is less than encouraging. After the initial burst of popularity, visitor numbers inevitably decline, leaving the new institution starved for the cash desperately needed to renew facilities and attract new revenue. At best, the institution can limp along for a few years. At worst, the institution faces bankruptcy. In both cases the state is faced with the prospect of either refinancing the institution, or letting it go bust. In the first instance, this means an extra burden on the state's finances, which are already under pressure from an ageing population, high unemployment and the need to renew the ageing infrastructure. In the second instance, bankruptcy is seen as throwing away a substantial investment. In reality, the course commonly adopted is to provide an additional injection of one-time funds linked conditional on becoming self-sufficient in a given time frame. All this does, however, is to emasculate the institution further, and push it further away from its initial mission. In either case, what remains is a building; another monument to short sighted planning.

Based on the American experience, Michael Kimmerman puts the danger of the dilution of the museum's mission succinctly:

'In the way that politics frequently works, left and right have met around these issues of populism and spectacle. As usual, both sides claimed to speak for the people, while condescending to them. Conservatives argued that museums ought

to support themselves and not beg from taxpayers, unless museums could be more demonstrably responsive, and responsible, to the broadest public. It was de facto populism, not leftist populism, with the left's stress on diversity, and it resulted in the equivalent of Grandma Moses exhibitions to cater to so-called popular taste and American values. If it didn't mean more of those shows, it meant market-driven initiatives: more anodyne Impressionism extravaganzas, displays about Jacqueline Onassis at the Metropolitan, and Steve Wynn's profitable art gallery in the lobby of his Bellagio Hotel in Las Vegas, a marketing coup, which set the stage for the Guggenheim and Hermitage's opening a joint museum across the strip at the Venetian Hotel in October.⁷⁷

At the same time, arguments for the museum's educational mission, whilst valid, seem out of proportion to the enormous costs of new building and large staff. With inner-city schools under-funded, it is difficult to justify a new museum with even the most ambitious educational outreach programmes on the basis of twice-yearly visits to the museum.

ARE MUSEUMS SUSTAINABLE?

Today's museums are in a quandary. On the one hand, if they are to compete against other 'leisure activities' they are at a disadvantage due to high capital costs, high operating costs and often inflexible management structures. Few if any museums are 100% revenue financed, and there is little evidence that in the free market visitors would be prepared to pay the true value of providing even the best 'blockbuster' exhibitions if all the costs were factored in. On the other hand, if museums are to be financed from the public purse, they must demonstrate their value in terms of providing educational opportunities for those identified by the state as key target audiences. This too is problematic, given the high costs of the museum and the relatively little time any visitor spends.

Museum Directors are justifiably confused by what they see as a choice between two equally untenable alternatives. As Michael Kimmerman wrote in the New York Times after the Salzburg Conference in 2001:

'But what else would you expect? As Mr. Harris put it: "Museum directors could legitimately claim bewilderment at being told, simultaneously, to avoid the public trough and stand on their own two feet, but not to resemble too closely the commercial world that, after all, had to show a profit."

The new populism has increased the mythology of attendance. How do museums prove their worthiness to corporate and government sponsors today? By drawing more people through the turnstiles, and more kinds of people. Those with the purse strings demand it. Peter Weibl, the director of a museum in Graz, Austria, specializing in electronic art, talked at the seminar about the illogic of this concept. Attendance is considered a measure of public service by funders, government funders especially, who, without thinking the issue through, simply figure that the more people who visit museums, the more public-minded the museums must be, never mind that attendance has nothing necessarily to do with enlightenment. Museums, having therefore been instructed that success is to be measured by attendance numbers, then organize Monet and van Gogh shows, which guarantee big box-office returns, so they can declare themselves successful. The tautology is absurd.

The question should not be how many people visit museums but how valuable are their visits. Attendance at a museum is different from attendance at a ballpark or a movie. Partly the difference is that baseball and Hollywood are for-profit businesses while museums are educational institutions, although the more people the merrier at museums; to borrow a useful turn of phrase, museums are equal-opportunity elitists. But museums have not yet learned how to measure precisely the quality of the experience they offer – what their visitors are getting out of their visits aside from gifts in the gift shop and sandwiches in the cafeteria. The Getty Trust sponsored some expensive interviews in the 1990's, asking what visitors liked about museums, which displays they found instructive, what kinds of promotion worked better than others. But those were preliminary studies. Time and again in Salzburg, curators and directors talked about the need to boost attendance, which was almost all the time, the question that hung in the air was, money aside, to what end? ⁷⁸

It is clearly time to 'bell the cat' and declare that in their present form, most museums are not sustainable⁷⁹. The museum market is over-saturated, the operating costs are high relative to earned revenue, and productivity (however defined), cannot be enhanced by one-time infusions of technology. Most vulnerable are middle-aged, middle-sized institutions that are unable to generate sufficient operating revenue to remain attractive to the visiting public, thus slowly suffocating for lack of visitors and funding. As long as public funding continues to decrease – a likely scenario given the increasing demands on the public purse and decreasing revenue – museums must face a future where their survival depends on earned revenue.

It is clear that the worldwide trend is away from state support for the museum sector, a defection that will soon turn into a rout due to the demands on the public purse of an ageing population. So is the answer to privatise? If so, what does such a privatisation mean? Recently the Italian government announced plans to ‘privatise its museums, although what it meant was not spelled out. Melinda Henneberger writes “Mr. Berger, who was in charge of merchandising at the Metropolitan Museum of Art in New York, was hired as a consultant here in 1993 to bring modern marketing techniques to Italy. [...] He said the partial privatization was no threat to Italian art: “Private isn’t only General Motors. And American museums are private not-for-profit already. In Britain it’s a mix of private and public, and in France it’s run by the state. The Italian way will help alleviate a burden the state just can’t handle any more.”⁸⁰

As Berger notes above, there is a range of models to choose from, from wholly private, earned revenue-financed museums to not-for-profit foundations fully supported by an endowment. What is clear, however, is that without breaking free from its dependence on public sector funding, many medium-sized museums are doomed to eventual extinction. On the other hand, the vagaries of the market mean that total reliance on earned revenue or private funding is also an extremely shaky foundation on which to build the museum’s future. The solution, it would seem from the American experience, lies in a form of the endowment fund – investments in stocks, bonds or real estate that bring a return on investment that can be used to support the museum’s activities. This fund can be created by private patronage or public munificence. In fact, to be sustainable, it is imperative that the museum’s funding streams always remain diversified – earned revenue, sponsorship, private donations, grants from all levels of government, European, national, provincial and municipal. What is essential is that the fund (or foundation) be autonomous, and that its revenue, however meagre, not be at risk from the vagaries of further private or public decisions. Even an endowment fund has inherent risks. The market may underperform, meaning that the revenue from the endowment is reduced from one year to the next. Even more dangerous is the practice of withdrawing money from the endowment to pay for operating costs – a practice usually strongly discouraged by the Endowment’s Board.

Nevertheless, some museums succumb to the temptation. In the case of the Guggenheim, ‘the museum's endowment has declined in recent years, from \$55.6 million in 1998, to \$38.9 million at the end of 2001. An endowment consists of savings that produce interest and should not be spent. While donors have continued to write checks to the Guggenheim's endowment, Krens has regularly dipped into it, mainly to cover operating expenses.’⁸¹ This may have appeared an acceptable risk in the heady boom times of the 1990s – in the bear market of the first years of the 21st century, it appears to be suicidal folly.

THE FUTURE OF MUSEUMS

The future of museums looks grim. The museum is overdrawn, and it is not clear where the much-needed revenue should come from. Forced into a market where it cannot compete, the museum is forced to overtrade, using scarce resources to chase after a dismayingly wide range of possible revenue sources. Seduced into thinking that bigger is better and that growth is the key to health, the museum is overcrowded, thus destroying the very essence of the museum experience, and undermining the ability to use the museum to bring visitors into contact with masterpieces of culture. So what is the future of our museums? If they cannot survive from earned revenue, nor can they depend any longer on public funding, how should our institutions respond? I would argue that the answer is a mix of several strategies.

First, museums must scale down their ambitions and resist the temptation to confuse growth with health. By restricting its activities to its ‘core business’, operating costs can also be substantially reduced. Many medium-sized municipal museums remain under visited – large warehouses of city treasures, poorly maintained and understaffed. Often these same museums pay a large premium just to keep the doors open to snag the few hundred visitors who might wander in on a rainy weekday. But must all museums be open to all the public all the time? Certain museums with a specialist public, rather than chasing increased visitor numbers to cover high operating costs, might do well to consider being open on an appointment only basis, or one day a week. Many cities were caught up in the museum building frenzy of the 1980s and 90s, vying to outdo one another with potlach-like displays of municipal largesse. In the lean years of the early 21st century, perhaps some of these museums can be consolidated, their collections joined with the consequence of greater rotation and greater perceived change? In the museum ‘market’, surely some museums should be allowed to swallow others, while still others become extinct?

Second, the museum must aim at achieving institutional independence, and to ensuring its long term financial health based on an endowed Foundation model, supported by a mix of sources, without becoming dependent on any single revenue stream – financially or administratively. Whether a small community museum or a large tourist destination, the museum can only survive as long as it is managed as an autonomous whole. This means that all the key factors on which the museum stands or falls – an articulated vision, a motivated staff, and a sustainable financial strategy – must be able co-ordinated within a single, coherent, transparent administrative framework. Museums where the administration is separated from the leadership, where financial decisions are

taken independently from personnel decisions, where political influences shape the policies the museum must adopt – are destined to be structurally weak, ineffective, and fraught with inevitable conflicts of interest⁸². Even the Louvre is not exempt – ‘in a recent interview with the weekly magazine L'Express, Mr. Loyrette said the financial squeeze had forced him to cut his conservation budget by 25 percent and to cancel or postpone several temporary exhibitions. [...] Mr. Loyrette told Le Monde that he “very largely shared” the conclusions of the Cour des Comptes [highly critical of the Louvre’s dependence on the French Ministry of Culture]. “The difficulties described in the report are all the more explicable because they are structural,” he said. “They are a product of the tutelage exercised over the Louvre.”⁸³’ The importance of operational autonomy and a transparent decision-making structure, cannot be underestimated as a key factor in the museum’s to ability respond flexibly to change. Moreover, the better managed the museum, the more likely that it can fulfil the promises it makes to the many stakeholders necessary to support the museums activities.

Third, the museum should return to a focus on its core values – Veach’s ‘five fingers’ – in the interests of generating a slowly growing base of users, not onetime visitors. It should look to the library – or the piazza – to provide a model of use, not just one-time visits. In the ecology of museums, each museum should be encouraged to find its ‘niche’. Those who have well-trained and motivated educational staff should use them to advantage to create programmes for the schools, those over-stocked with scholars should research and publish. Kenneth Hudson always argued that the museum was in fact more like a private club than a disco, and that its ambitions should remain modest, and its financial health based on its membership base – its users. I would also argue that a museum’s future is also based on its specificity – its collections. Like a library, a museum is a resource, which should serve a broad base of interested and informed users. Like a piazza, it is a place that should sustain the broadest possible range of activities related to the experience and enjoyment of the museum’s collections.

As Michael Kimmelman wrote recently in the New York Times,

[The museum’s] priorities need restating. They are neither universities nor Disneyland. [...] But beyond leisure and entertainment, our perception of a museum, and its moral value, still has to do with our desire for sacred space, even if we are reluctant to put it that way. Museums exist to offer us something that we can’t find anywhere else: an encounter, whether with an object or idea (or even with something on the Internet if we consider virtual museums) – an encounter we deem true and authentic in a place respectful of this private transaction. Otherwise, museums are just fancy storage facilities and gift shops.

This sounds obvious but evidently isn't. It entails less equivocation, less democracy, less blurring of the line between commerce and content, and a reassertion of authority on the part of museums, which must restate their convictions about esoteric beauty, the ethical import of aesthetics and the special, if intangible, power of the things they possess. The goal is not for every museum to become another Frick. It is to use the excellent new tools available – technological, didactic – to become more effective and more affecting places. Between the university and Disneyland is not a morass of compromise but a realm of rational entertainment, a concept harking back to the Enlightenment. Rational entertainment requires a standard of quality on the part of museums. Quality has become a dirty word, an antidemocratic concept, according to museum critics, but quality, and the ability to explain it eloquently, are still what separate museums from shopping malls. Museums need to reclaim the idea of quality because it is what people want when they go to museums: to be told what they should value, so that they can then decide for themselves whether or not to agree – which is how a free democracy really works. Standards change, values evolve, but without them at any given moment, we are lost.⁸⁴

The museum must return to its core values, and deliver on its core skills. The museum must be home to collections and to learning from those collections. The museum 'is a place where one learns that the life of the mind is a pleasure' in the words of Jonathan Miller, 'an institution for the prevention of blindness' according to Nelson Goodman, 'a permanent storage battery' for Sherman Lee. The museum must look towards the creation of 'lightweight', flexible projects that take advantage of the museum's unique collections, not heavyweight blockbusters that disrupt the priorities of the museum and distort the identity of the museum. In the future, the museum must return to being a learning hub – not a 'destination attraction'. Then, and only then, will museums be sustainable and remain a vital societal resource – a multi-faceted piazza for the learning society.

¹Bradburne, J. Truth-telling and the Doing of Science, Amsterdam: 1993

²op cit

³ A critique of the prevailing 'deficit model' of the public's understanding of science can be found in Wake, D. A. and Bradburne, J. Fields of Knowledge, AMCSTI/Infos printemps 1993

⁴Many science centre professionals might argue that hands-on exhibits are, by definition, 'bottom-up' and user-driven. This contention is explicitly challenged in Wake, D. A. and Bradburne, J. Paradox Lost: Rediscovering Scientific Creativity, Alliage No.6, 1991

⁵ Described in Wake, D. A. and Bradburne, J. Priming the Pump: Building a Science Network in Alberta, in La science en scène, Paris: Palais de la Découverte; 1993

⁶ Described in Wake, D. A. and Bradburne, J. Au-dela de l'oeil nu, Alliage No. 15

⁷ Described in Bradburne, J., Mine Games, La Revue des Arts et Métiers No. 10, Spring

⁸ A complete account can be found in Tracing our routes/ Chemins à faire in Vers les musées du XXI^e siècle - La Révolution de la Muséologie des Science: Nouvelles perspectives américaines, européennes et australiennes ed. Bernard Schiele PUL; 1997

⁹ the planners of newMetropolis would have a great deal of difficulty accepting the statement made by Beetlestone et al. that 'Most visitors are intimidated by science. That's why science centers exist. Yet everything in a science center is, by definition, scientific.' Beetlestone, J.G. et al, The Science Center Movement, Public Understanding of Science Vol. 7, No. 1 January 1998 pp 8

¹⁰ ASTC Yearbook of Science Center Statistics 1997

¹¹ The Evaluation of the Pilot Phase of the Cardiff Interactive Technology Centre 'Techniquet' conducted by the Centre for Research in Primary Science and Technology at the University of Liverpool in April 1988 was critical of the project on several grounds, but particularly for fragmenting and decontextualising scientific subject matter, and provided some advice. 'It might well be the case the developers will wish to be more selective of content in the future, as the public's response and the effectiveness of various types of experience are better understood... For example, under the umbrella of science and technology are included experiences involving obvious scientific principles, less obvious technological applications, examples of measuring techniques, visual illusions, spatial problems etc. All these experiences might well be fascinating and capable of arousing curiosity. Their effectiveness in supporting the exhibition objectives is not always self-evident. One of the difficulties of presenting a range of experiences to the public in a context such as Techniquet is that there is no obvious linking concept to help people make sense of their experiences. Without such a strong background context, there is a danger of the experience becoming fragmentary, and consequently trivialised.'

¹² For a thorough and detailed discussion of the relationship of science studies to the science centre, and of the science centre's relationship to science, see Regeer, B. Two Paradoxes and a Triangle: the public understanding of science exhibited, unpublished Master's Thesis, Amsterdam, 1996

¹³ The effectiveness of hands-on exhibits in terms of learning, and the response that they are intended to trigger, rather than communicate, is made clear in the Evaluation of the Pilot Phase of the Cardiff Interactive Technology Centre 'Techniquet' (op cit), 'As might well have been predicted, the sample visitor responses also indicate that in one or two exhibits, including some of the more popular ones - 'Bernuilli Table', for example - there was little understanding of the scientific principle which explains the phenomenon presented. This is not to suggest that there should or could have been understanding... For example, in some cases, visitors were provided with useful intuitive experiences which they could not be expected to describe or understand, but which might provide under-pinning experiences supporting later understanding.'

¹⁴ The increasing importance of constructivism in the science centre debate in recent years, championed by planners such as George Hein, has called many of these approaches into question. Moreover, debate in the related fields of the public understanding of science, science dynamics, and the sociology of science have focussed on the inadequacy of the traditional institutional approaches. Despite these critiques, many institutions remain committed to the traditional hands-on approach pioneered in the late 60s, based on an implicit reception theory and an unreflectively realist position tomorrow. See in particular Visitor Behavior Volume XII Nos. 3&4 Fall/Winter 1997

¹⁵ A report on the closure of the Columbus Center's Hall of Exploration due to inadequate visitor numbers (it attracted only 70,000 instead of the projected 280,000) can be found in the [ASTC newsletter](#) Volume 26 Number 1 Jan/Feb 1998

¹⁶ This phenomenon is shown graphically in Beetlestone, J.G. et al, *The Science Center Movement*, [Public Understanding of Science](#) Vol. 7, No. 1 January 1998 pp 6

¹⁷ ASTC reports that during 1990 - 1996, 86 new science centres had opened, more than in the entire previous decade.

¹⁸ NINT annual report 1984

¹⁹ NINT Mission Statement 1979

²⁰ Statement made in a lecture at the conference on *The Public Understanding of Science* The Science Museum, London, April 11, 1990

²¹ The mission of the science centre to 'beguile' the visitor into engaging with science (in the words of former Techniquest director John Beetlestone) can be seen in their mission statement, where the goal of the exhibitions is 'to engage, to amuse, and to engender a sense of fun in the exploration and understanding of the world around us.' from the *Evaluation of the Pilot Phase*, op cit.

²² See the Dutch Government's white paper [Scanning the future: a long-term scenario study of the world economy 1900 - 2015](#), SDU; Den Haag: 1992

²³ This argument is made at length in Douma, J. [Prototyping for the 21st Century](#), Amsterdam; 1994

²⁴ op cit "The reason for writing [the Discourse] has been primarily to develop a vision to guide our development. For we truly believe that we cannot simply build a Science Centre without having reflected as thoroughly as possible on what role this new centre should and could play in our present and future society. Science centres and museums alike have always been children of their time and this infant of ours should be able to participate in societal life for as long as possible."

²⁵ The draft framework document was presented in Fall 1997, and will be published in Spring 1998

²⁶ See Hudson, K. [A Social History of Museums](#). Atlantic Highlands: Humanities Press; 1975 and Hudson, K. [Museums of Influence](#). Cambridge: Cambridge University Press; 1987

²⁷ In the *Evaluation of the Pilot Phase of Techniquest*, cited above, data show that the average mean time spent with the exhibits was 50 seconds, with mean interaction times at individual exhibits ranging from 14 seconds to 182 seconds. op cit

²⁸ This is of course not true for all science centre exhibits, and much of the work of the past three decades has been to create exhibits which allow real interaction, leave room for the visitor to ask and answer their own questions, and truly engage with the material. Sadly, many, if not most, science centre exhibits are still just devices that allow the visitor to set into motion principles or phenomena that someone finds interesting, and the so-called hands-on interaction merely turns the user into an extension of the exhibit, a soft hand to bring forth the phenomenon the designer or educator intended. This tendency for exhibits to become vehicles for the designer's, rather than the visitor's questioning was noted by science centre pioneer Frank Oppenheimer, founder of the San Francisco Exploratorium, who said "I don't want anyone to leave a science center thinking: 'Gee, isn't someone else clever.'"

²⁹ Many studies bear out the importance of the emotional, or 'hearts-on' character of the museum visit, which stems in large part from its social nature, undertaken with family and friends

³⁰ This is of course a broad generalisation, and discounts the confounding effect of temporary exhibitions, special programmes, multiple school visits (which are formal, rather than informal), and VFF, all which serving to mask the three peaks

³¹ It could be argued that the fact that the museum visit is most often an emotionally-charged, social occasion in the company of family and friends accounts in large measure for the observed frequency, and that even repeat visits based on this affective charge merely re-inforce the pattern of visits.

³² As an example, in 1997, over 85% of the visitors to the Van Gogh Museum in Amsterdam were foreign tourists

³³ Yearbook of science center statistics 1997 ASTC; Washington; 1998

³⁴ See R. Russell, Attendance Projections: Real and Imagined, The Informal Science Review, No. 25, July/August 1997

³⁵ in the same issue of The Informal Science Review is the report that the Pacific Northwest Museum of Natural History, declared one of America's best new museums by the Smithsonian Institution, is closing in 1997 - after only opening in 1994! Issue No. 27 of the same Journal reports the closing of the Columbus Centre Hall of Exploration in Baltimore due to inadequate visitor numbers

³⁶ evidence of this phenomenon can be found in a privately commissioned feasibility study conducted for Erlebnis Wien by Ravest Associates in conjunction with Drew Ann Wake and the author

³⁷ the inability of conventional hands-on physics exhibits to hold visitor attention has been discussed for the past ten years; see Wake, D.A. and Mitchell, J. An informal study of visitor behaviour at two exhibits, Unpublished research paper, Toronto: Ontario Science Centre; 1987

³⁸ See Drew Ann Wake's contribution to the debate in The Informal Science Revue No. 20 under the heading 'Are Science Centres Doomed?' which sets out many of the arguments made in this paper

³⁹ This message has not yet gotten through to many in the field, and the science centre is still thought to be the vehicle for launching and demonstrating new technologies. Nora Lee, editor of the edutainment trendspotting magazine the E-Zone, writes 'Science centers have always been on the cutting edge, particularly in presenting new technology to the public.' This statement betrays a certain confusion between the role of World's Fairs, temporary events that have traditionally been the launchpad for new technology, and science centres, which by the fact of their permanence, cannot keep up with the pace of replacing new technologies with even newer ones.

⁴⁰ ASTC Newsletter Volume 26 Number 1 Jan/Feb 1998 pp.2

⁴¹ Museums built in the 80s such as the Frankfurt Museum für Kunsthandwerk, housed in a striking Richard Meier building are already undergoing a crisis due to low attendance, and the Lottery-funded Bristol 2000 project has already forced the closure of Britain's oldest hands-on science centre, the Bristol Exploratory, causing speculation about the negative impact on smaller, community centres by large new-build projects.

⁴² Unfortunately, the opposite strategy - to fund 'bricks and mortar' at the expense of programmes seems to be the norm, even in countries where investment in people would seem to demand the higher priority. Bruce Lewenstein recently visited the Far East, and his report highlights a common finding that many Third World governments prefer to build monuments than to create new institutions of informal learning. 'After a small start several years ago, the Indonesian Science and Technology Center opened in November 1995. It occupies a brand-new 24,000 sq-meter, 3-story facility in the Taman Mini Indonesia Indah ... reputedly Indonesia's most popular attraction. The science museum is open, but still only partially full. It has about 200+ exhibits. Some were built by the LIPI's institute on instrumentation and standards, relying on the "cookbooks" produced by the Exploratorium. Some were bought from science museums in Australia. Some are donations from companies; a few of these appear to be designed for interactive science museums, but many appear to be last year's trade show booths, ranging from a BMW exhibit touting its new aluminum drive shaft to a British defense contractor's exhibit on the lethality of its missiles. Although the museum staff had hoped to group exhibits into four areas (transport, life sciences, telecommunications, and energy), the exigencies of which exhibits they could produce, fund, or borrow have led to something of a mish-mash.

Dr. Jenny R. E. KILIGIS, the director of exhibits and education, said they are now in the process of trying to regroup the exhibits to create some coherence. Nothing she said implied that the museum has a clear long-range plan of how to build its collection of exhibits systematically. She knows that many of the exhibits provided by companies are inappropriate both in tone and design for the science museum, but accepts that for the near term she will have to work with what she can get. ' unpublished report, August 1996 See also Bradburne, J. Informal Science in the Jordan, Paris: internal UNESCO Technical Report; 1993

⁴³Based on the author's experience on numerous science centre projects

⁴⁴ Our target - successfully met - for the exhibition *The Body in the Library*, opened in Calgary, Alberta, in 1993 was CDS\$ 50/ft² (@\$385/m²)

⁴⁵ Hood, M. Leisure Preferences are the key to science centre audience research, Unpublished paper, Vantaa: World Science Centre Congress; 1996

⁴⁶ see Bazin, M. *Ciencia viva à Rio* in Alliage No.3 spring 1990

⁴⁷ The Anacostia Museum was developed by American psychologist Dr. Caryl Marsh for the Smithsonian Institution in the 1967, and was the first such museum in a predominantly black neighbourhood

⁴⁸ see Stocker, G. et al. Ars Electronica Center: Museum of the Future, Linz: 1996

⁴⁹ Shortland, M. No business like show business Nature Vol. 328, 1987

⁵⁰ Since it opened in June 1997, newMetropolis has been conducting active research into the effectiveness of its exhibition strategies. This research is due to be published beginning in late 1998.

⁵¹ notably in Bourdieu, P. and Darbel, A. L'amour de l'art, Paris: Editions de minuit; 1969

⁵² see especially Cziksentsmihalyi, M. Flow New York: Harpers; 1990 and Cziksentsmihalyi, M., Talented Teens, New York: Harpers; 1990

⁵³ Preliminary data indicate that newMetropolis visitors spend substantially greater amounts of time engaging in the exhibits than at any other institution for which we have data. The average visit to newMetropolis is nearly five hours - a substantial investment in time for only 5000 m² of interactive exhibitions. Moreover, data also suggest that despite the emphasis on games and game playing, users do make the connection between the game activity and related social and technological issues.

⁵⁴ In a recent project sponsored by a government ministry, Dutch citizens were asked to 'vote' on their choice of planning strategy for the future of the country in 2030. After substantial publicity, over 1600 written ballots were sent in from throughout the country. To co-incide with this event, newMetropolis designed an interactive video debate on four of its 'Actua' computers. In this debate, users could listen to short video clips promoting different positions, and having heard at least four opposing positions, could vote. In the two months of the national poll, over 2700 'votes' were cast at newMetropolis - more than half of the entire poll! The complete data from this experiment will be published in late 1998

⁵⁵ The 18 'Actua' computers at newMetropolis provide both open access to selected Internet information providers, and an extensive collection of sites linked specifically to each of newMetropolis's 150+ exhibits. During an average week (@6 - 7,000 visitors), approximately 55,000 pages of information are consulted

⁵⁶ Kenneth Hudson, 'The Public Quality of a Museum', Les cahiers d'étude Nr. 6, pp. 3-5, ICOM, Paris, 1999.

⁵⁷ op.cit

⁵⁸ Since the time of writing (January 2002), the analogy used has taken on a prescient cast: 'as part of preparations for its role as European Capital of Culture 2008, Liverpool plans to spend £35m converting

its historic Central Library into what it calls a “Discovery Centre”. Fine... but don’t ask about the books. Five floors of the building will be ripped out to create a spacious new entrance, a visitor centre with café, a huge gallery space and a room containing 500 shiny new computers. Curiously, the three pages of effusive press release about the scheme don’t mention the word books once. What a way to celebrate European culture.” *Private Eye*, No. 1096, December 26, 2003 – January 8, 2004, p.27

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⁶² As an example, in 1997, over 85% of the visitors to the Van Gogh Museum in Amsterdam were foreign tourists

⁶³ Celestine Bohlen in the *New York Times*, November 20, 2001, ‘The Guggenheim’s Scaled-Back Ambition’

⁶⁴ Hood has written extensively on the psychographics of museum visiting. See Hood, M. ‘Leisure Preferences are the key to science centre audience research’, Unpublished paper, Vantaa: World Science Centre Congress; 1996

⁶⁵ From Louis Kahn's notebooks, quoted in Lobell, J. ‘Between Silence and Light’, Boston; Shambala: 1979

⁶⁶ Kenneth Hudson, *The Right and Wrong Road for Museums*, op.cit

⁶⁷ Thomas Krens in the *New York Times*, June 30, 2002, ‘Is the Go-Go Guggenheim Going, Going...’ by Deborah Solomon “It’s easier to raise money for a building than a show [...] A building is permanent.”

⁶⁸ Alan Riding in the *New York Times*, December 5, 2001, ‘A Stodgy Museum Spruces Up’

⁶⁹ Michael Kimmerman in the *New York Times*, August 26, 2001, ‘Museums in a Quandary: Where Are the Ideals?’

⁷⁰ For instance at the Rotterdam Kunsthalle

⁷¹ For instance the Discovery Centre in Baltimore, which closed after a year due to low attendance

⁷² For instance Frankfurt’s Museum für Kunsthandwerk, which saw visitor numbers of over 350.000 in 1986 fall to a more or less stable base of 85.000 by 1996

⁷³ Henri Loyrette in *Le nouvel observateur*, 28.03.02, ‘Les musées en crise’ pp. 64-65

⁷⁴ McGuggenheim is not the only metaphor used to describe Thomas Kren’s vision. The critic Jerry Saltz, writing recently in *The Village Voice*, called for Krens’s resignation and went on to say, “The trustees and board members who helped him twist this institution into a kind of GuggEnron should go as well.”

⁷⁵ Since the time of writing, the author has resigned from his position as Director of the Museum for Applied Art in Frankfurt. Since January 2003, he has been Director of the Next Generation Foundation, based in London, England.

⁷⁶ Alan Riding in the *New York Times*, January 30, 2002, ‘French Government and the Louvre in a War of Words’

⁷⁷ Michael Kimmerman in the *New York Times*, August 26, 2001, ‘Museums in a Quandary: Where Are the Ideals?’

⁷⁸ Michael Kimmerman in the *New York Times*, August 26, 2001, ‘Museums in a Quandary: Where Are the Ideals?’

⁷⁹ The exception is large museums situated in major tourist destinations, which can mitigate the effects of the ‘S’ curve by the sheer volume of new tourists resulting from the coming of age of each new generation of cultural tourists – as long as unexpected events like the attacks on the World Trade Center do not disrupt travel practices. Small museums – ‘museums with charm and museums with chairs’ in the words of Kenneth Hudson, are also likely to survive. Unburdened by high operating and maintenance costs, they can respond more flexibly to changes to the funding landscape.

⁸⁰ Melinda Henneberger in the *New York Times*, December 3, 2001, ‘Italy Plans to Have Private Sector Run Museums’

⁸¹ Deborah Solomon, ‘Is the Go-Go Guggenheim Going, Going . . .’ in the *New York Times*, June 30, 2002

⁸² op. cit Alan Riding in the *New York Times*, January 30, 2002, ‘French Government and the Louvre in a War of Words’: The report of the Cour des Comptes noted that the autonomy promised to the Louvre in 1993 was to date “largely fictitious” because the museum still had to answer to two

Culture Ministry departments, the Reunion of National Museums, which oversees 33 government- owned museums, and the Direction of French Museums, which fixes government subsidies to museums. The government currently provides 70 percent of the Louvre’s \$110 million annual budget.

The report also took the Louvre’s side in a long-running dispute with one of those departments. As part of a government policy of sharing revenues from ticket sales at the Louvre and the Palace of Versailles with smaller museums, the Louvre gives more than \$9 million a year to the Reunion of National Museums and

receives only \$4 million in return. The report said this diversion of funds prevented the museum from fulfilling its functions.

⁸³ op.cit Alan Riding in the New York Times, January 30, 2002

⁸⁴ Michael Kimmerman in the New York Times, August 26, 2001, 'Museums in a Quandary: Where Are the Ideals?'