

**Parallel Session 20: Museums and science centres in the transmission of cultural diversity**

**STRENGTH IN DIVERSITY – A NEW SPORT EXHIBITION  
COMMUNICATES SCIENCE WITHIN A CULTURAL CONTEXT**

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**Abstract**

*Sport: more than heroes and legends*, an exhibition at the Powerhouse Museum in Sydney, Australia, presents science and technology along with the design, culture, history and fashion associated with sport. Diverse themes are woven together and communicated throughout the exhibition using varied display media including showcased objects, interactives and audiovisuals. Although complicated to develop, the resulting exhibition is a varied learning environment which engages a wide range of visitors. I justify the extra effort because I believe the general public grasps a greater appreciation of science when it is presented within a broad and meaningful social and cultural context.

**Key words:** sport, culture, diversity

**Text**

*Approach, messages and audience*

The *Sport: more than heroes and legends* exhibition covers the science, technology, design, culture, history and fashion of sport. We interrelate these diverse topics to show many ways that sport and society interact.

Important messages which appear in various guises through the exhibition include: that many women, indigenous Australians, migrants and disabled people are sporting achievers; the role of sport for health; wear protective gear to play sport safely; and a featured section about unsung volunteers and others who contribute to the Australian sporting culture. While the exhibition focuses on Australian involvement in sport it has an international context.

This large and varied exhibition contains a lot for nearly everyone, even for those who think they have no interest in sport. Visitors wander through the exhibition very much in an exploring mode, with various displays capturing and holding the attention of different people and much intergenerational interaction. The interactive exhibits are intended for all users but hold special appeal to children.

The strength of the exhibition is its coherent diversity. More than 60 sports are represented in unexpected and pleasing ways at every turn. Frequently the curious, beautiful or historical content captures a visitor's attention and they are

drawn to explore surprising links between disparate subjects. The interactives are mostly science related, engaging to use and encourage the visitor to contemplate some relationship between what they do and the concepts involved.

#### *Science and technology content*

There are more than 100 stories about and references to science and technology in the exhibition. They cover the past, present and possible future and are often linked to fashion or design topics. Some subjects covered are:

- the evolution of a wide range of playing and protective equipment,
- how the body works to be a 'Human sport machine',
- effects of performance enhancing drugs,
- why it is important in many sports to minimise wind resistance,
- effects of changing technologies on sports, and
- how new materials can even lead to new sports or increase accessibility.

Other content includes eight international and regional fashion stories, numerous examples of design, several cultural topics and many historical references. The exhibition combines more than 700 items (most in showcases), 15 interactive exhibits, more than 30 audiovisuals and many graphic elements.

#### *Science in a diverse context*

I believe science and technology becomes more engaging and intriguing to a wider audience when ideas are placed within a broad and meaningful social context. To do this for an exhibition requires researchers with varied subject backgrounds working together. They develop the diverse themes and propose appropriate and varied ways to communicate individual or related ideas - this leads to a multiple-media exhibition. The team must also develop a simple and flexible structure to bring coherence and focus to the rapidly multiplying stories. The exhibition design process balances the content with a variety of experiences and moods throughout the final display.

#### *Exhibition evaluation*

An interview-based evaluation of 200 visitors to the Sport exhibition finds that 98% of them would recommend the sport exhibition to others, the highest rating we have achieved for any internally or externally developed exhibition. 95% of those interviewed rate the exhibition as 'good' or better with 19% saying it was 'extremely good'. Visitors' thoughtful comments about 'preferred aspects' of the exhibition and 'learning responses' were encouraging, but there were relatively few specific mentions of science and technology. A more focussed study would be required to determine how many visitors were appreciating the science information.

#### *Organising concepts – first the labels, then the gallery*

Verbs, such as 'run', 'jump', 'fight', 'hurl and heave', 'celebrate' and 'kick', are used as a means to organise and unify information. These engaging action and

emotion verbs show up in heading and subheadings of most labels. Labels vary from telling stories of individuals or events, to explaining technology and how it has affected the sport, to placing fashion in social and other contexts, to relating scientific concepts to sport.

The verbs are grouped to form five exhibition sections:

1. Elite and Olympic sports: Australians at the world's games
2. Weekend warriors and watchers: playing the most popular sports
3. Bats, balls, bows, bullets: and super sports gear
4. The great outdoors: sports in the elements
5. Heroes and legends: and your personal best

#### *Interactive exhibits*

Many of the interactive exhibits achieve the challenging goal of being fun to use while making the visitor think about what they are doing. Experiences range from handling athletic field equipment or role-playing while standing on a victor's podium to more complex doing and learning activities involving kicking, jumping, throwing, aerodynamics, physiology, weight classifications, sports media technology, evolution of sports clothing and textiles, biomechanics of diving, surfing and sailing.

#### *Public and educational programs*

A wide range of programs complement the exhibition, including for people with a disability.

*Fight - an opponent: combative sports area of Elite and Olympic sports section*



The showcase at rear presents unarmed combat sports of different cultures, protective equipment worn to limit injuries and how boxing has inspired fashions. At nearby interactives, visitors use a scale to find their weight class for various sports, learn how their body is a 'human sport machine' and handle athletic field equipment (far left).

*Fight – for acceptance: the semi-sweet social science of boxing showcase*



A display which explores the relation between sport and social class and skin colour.

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**SCIENCE IN MUSEUMS, NOTES FROM A PERIPHERAL EUROPEAN COUNTRY**

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**Abstract**

This paper aims to discuss what connection is there between science production and science communication through museums in a peripheral European country (Portugal), where the development of both science and scientific museums is very recent.

**Key words:** scientific museums, Portugal

**Text**

Opening remarks

This paper is partly inspired by an episode that occurred at a workshop on communicating science held in Portugal last year. The session was being chaired by a journalist and his opening words were to this effect: since there is not much science being done in Portugal, the main mission of Portuguese scientists in communicating science is to help us, journalists, translate information about the discoveries and innovations made in other countries.

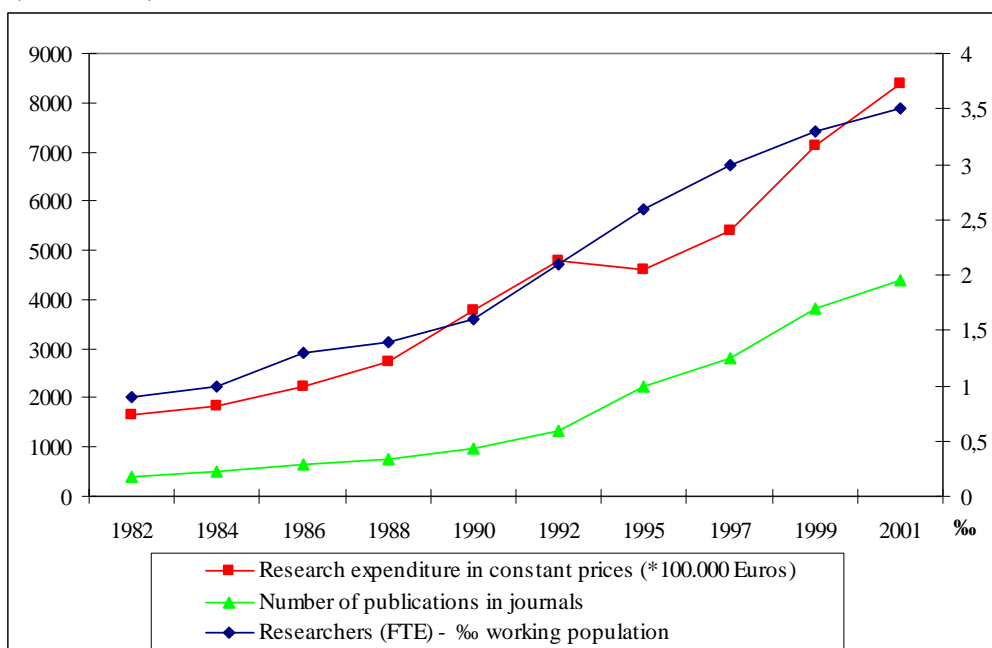
Though it is true that Portuguese science is far from being in the lead of international R&D and Innovation, it has experienced in recent years a surge of investment and growth that seems to have failed to attract the attention of the public and of the media. What part do scientific museums play (or fail to play) in disseminating information about current research being done in Portuguese institutions?

Drawing on ongoing research for a PhD thesis<sup>1</sup>, this paper attempts to debate this issue, based on interviews to museum and science centre directors and to the head of the national agency for promoting scientific culture, as well as documentary and exhibition analysis.

The growth of scientific research in Portugal

After centuries of neglect (see Gonçalves, 2001), Portuguese science has grown considerably in recent years: the number of research centres and research personnel has augmented, government funding and total research expenditure have risen, the research results are increasingly divulged among the world scientific community, through publication in international peer reviewed journals (see Figure 1).

**Figure 1 – Research expenditure, researchers and publications in Portugal (1982-2001)**



Sources: OECD, Main Science and Technology Indicators database, 2003; Observatory of Science and Higher Education (Portugal); ISI, National Citation Report for Portugal 1981/2002

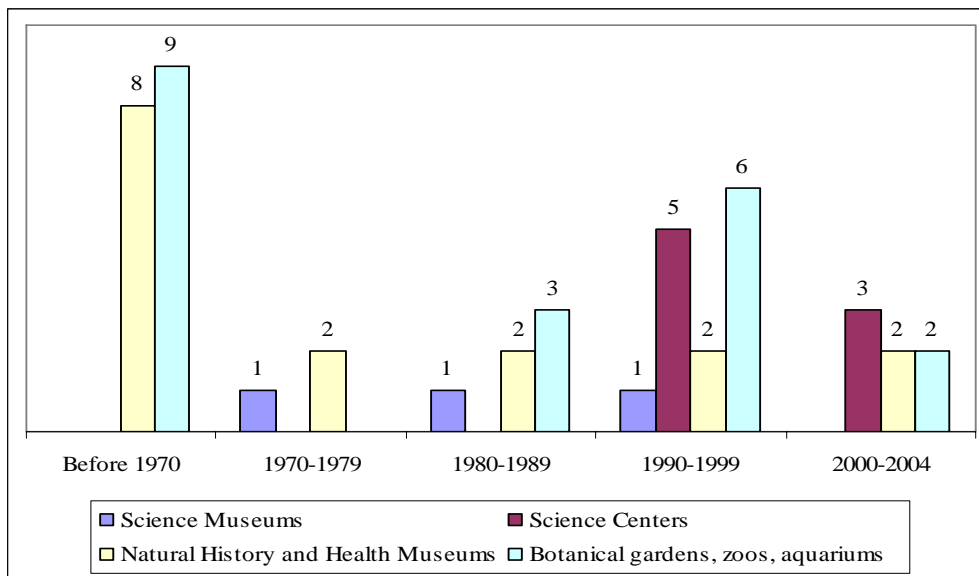
This development has been mainly due to three factors: political change (the transition to democracy thirty years ago, the creation of a Ministry for Science and Technology in 1995), the expansion of higher education (a substantial increase in the number of graduates, the establishment of dozens new public and private universities in the last two decades) and integration in the European Union (which has meant not only access to structural funding but also the need to comply with common policies for promoting research and innovation).

#### The growth of scientific museums

The late development of Portuguese science has been reflected on the creation of scientific museums (see Figure 2). Before 1970 there were merely a few natural history museums, botanical gardens and zoos. Since then, just three science museums have been created and only one of these is regularly open to the public. However, in recent years, government investment has also reached the area of scientific culture, through a large array of initiatives that have included the creation of science centres scattered throughout the country and some support to more traditional science and natural history museums.

These scientific museums are affiliated either to universities or to the Ministry of Science or to local authorities. Nevertheless, in the majority of cases there is a strong participation of university lecturers and researchers as directors or in scientific advisory boards.

**Figure 2 – Scientific Museums in Portugal, by type and by first year of opening**



But does this mean that these museums attempt to show what kind of science is being produced in Portugal?

#### Scientific research in scientific museums

Sadly, no. Though there are known difficulties in exhibiting contemporary science (see several articles in the works edited by Farmelo and Carding, 1997 and Lindquist, 2000), most museums make absolutely no mention to current research and to Portuguese research centres and researchers. Partly due to the financial constraints that hinder most of the museums, there is practically no homegrown development of exhibitions: there is still a strong reliance either in traditional historical presentations or in ready-made displays acquired abroad. Since science diffusion activities have very little value in scientific careers, most museums are chaired or advised not by active researchers but by professors approaching retirement. Additionally, one of the science centres, run by an industrial association, had plans to include an area where research institutions could show to the public (and to prospective business partners) their new research results, prototypes and innovations. Yet, this has never been put into effect, given that no researcher has ever shown interest in the initiative.

However, there are exceptions. On the one hand, since most natural history museums also function as research centres, some do include in their exhibitions a few references to their research activities and to the scientific labour that underlies the items on display (this is more common in palaeontology exhibitions). On the other hand, most museums and science centres promote many other activities besides exhibitions in which scientists appear fairly more interested in participating: lectures, debates, live experiences, field visits and guided tours of laboratories.

Though science is by nature universal, if public understanding of science is to be achieved through scientific museums, it seems quite a lot more effort has to be put into exhibiting current Portuguese research.

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**ART AND SCIENCE AT AN EXHIBITION: MUCH MORE THAN SIMPLY PICTURES**

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**Abstract**

A new exhibition being created by the Universum science museum and the Mexican National Institute of Fine Arts explores the deeper connection between art and science. It shows how both originate in the human brain and how they are informed by the brain's peculiarities. One section explores how our brains make meaning out of patterns and structure. Another suggests that theory building in science is guided by aesthetic criteria such as parsimony and unity in diversity. The exhibit as a whole suggests that art and science are the same search for structure, a search spurred by the pleasure of creation.

**Key words:** art, science, museums

**Text**

Introduction

Mysterious as art and science may sometimes seem, their roots lie ultimately in the material processes of the human brain. As argued in Wilson (1999) and Pinker (1999), our brains are machines designed by evolution to solve specific problems. Consequently, the mind is not a blank slate that only experience can mold, but a structure of hard-wired processes that dictate a well defined human nature (Pinker (2002)). Connections are therefore to be expected between everything humans do, particularly between art and science. As Miller suggests (Miller (2001), 6), "Instead of referring to an 'interplay' between art and science, we must begin to speak of ideas that were developed in common by artists and scientists." A novel approach to presenting art and science in a science center is to explore these ideas.

The exhibition

The exhibition opens with a section on the senses as "feelers" whereby the brain takes in the outside world. By means of tactile enigmas, optical illusions, and musical stimulations, this section suggests that perception is a collaborative effort between the sense organs and the brain.

The second section presents the brain as an interpreter (Gazzaniga (2002)). In order to make sense of the myriad stimuli it must deal with, the brain has evolved to excel in a number of tasks, such as connecting the dots (finding patterns) and reading between the lines (completing missing information –or making it up!).

These abilities are important in both science and the arts. In science they are an essential part of theory-building. In the arts, cinema and good writing, for example, convey meaning without tiresome explanations by letting the public connect dots and read between lines.

But why did we evolve these capabilities? The answer is a dictum for fitness in the environment of our ancestors: predict or perish. A knack for predicting the behaviour of nature, or of your neighbours, was adaptive in the Paleolithic environment where the brain evolved, as indeed it still is.

Pinker (2002) writes: “Organisms get pleasure from things that promoted the fitness of their ancestors” (p. 405). We suggest that the joys of art and science are associated with the pleasure we get when using our brains to seek or create symmetry, order, harmony, structure; in a nutshell, the pleasure of finding form (science) and creating form (art).

The main section of the exhibit explores some of Miller’s “ideas developed in common by artists and scientists.” The Mexican playwright Bertha Hiriart, in Castro (2003), describes the art of drama as a search for accuracy, order, and beauty. As it turns out, that is not a bad description of science. There are other convergences. Science and the arts share a passion for unity in diversity and for hidden meanings. They also share the need for imagination and acute observation. These convergences are illustrated by examples from both disciplines.

#### Outlook

From the outset it was decided that the exhibition would not be explicative, but only suggestive, of these ideas. Text was to be kept at a minimum in accordance with the basic tenet that reading between the lines, or supplying missing information from clues, is one of the main adaptive abilities of the human brain and one on which art and science rely heavily. The exhibit does not impose a message on visitors. It proposes stimuli and experiences that point in the general direction of a new assessment of the link between art and science.

One message we do expect our visitors to take away with them is that science and the arts are not the antagonists that common belief makes them out to be. This may help pave the way to a better understanding and appreciation of science as an important part of culture.

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### **THE CATALONIAN MUSEUM OF MEDICAL HISTORY AND THE PROMOTION OF SCIENTIFIC CULTURE**

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#### **Abstract**

The Catalonian Museum of Medical History is developing a project that involves the move to a new building and the definition of a new museological proposal. The main objective is based on the consideration and value of antique scientific instruments as a means for the promotion of scientific culture.

Integrating the understanding of an antique scientific instrument and the experimental practices associated to it is not an easy task. This contribution tries to cope with such a challenge by showing the need of creating team works of historians, teachers and curators in order to develop historical and didactic research projects.

**Key words:** Antique scientific instruments, science museums, teaching and history of science, technology and medicine

#### **Text**

In the last few years, historians, teachers and curators interested in the history of science, technology and medicine have pointed out the explanatory potentiality of antique scientific instruments.<sup>1</sup> Such a kind of instruments, it has been maintained, holds three remarkable features:

- (1) its value as a category of historical analysis in order to widen the interests of history of science;
- (2) also its capability to stimulate a critical reflection as a complementary resource available to science teachers;
- (3) and finally the opportunity of transforming those museographical objects into tools of science popularisation.

So, this contribution stresses the importance of antique scientific instruments in order to tackle the history of science, technology and medicine, not only as a support for the teaching of science, but also as a means to place science, technology and medicine in the social context of our culture by providing useful materials and elements to school teachers. Not only these objectives would be pursued, but also that of medical education by addressing relevant issues in health and medicine. There is therefore a firm conviction that by resorting to these kind of antique objects, the Museum would become and act

as a complementary place to address scientific concepts in context alongside with the promotion and explanation of ideas on a healthy lifestyle.

But this is not an easy task and it seems that the main question is how to put into practice this objective. Such an objective requires the creation of working teams of historians, teachers and curators (and also other kind of professionals, such as physicians, scientists or educators). In our proposal the emphasis on the explanatory capacity of antique scientific instruments, before becoming closed instruments like black boxes, lies in their available information on the theoretical assumptions brought in their conception, design and use.<sup>2</sup> Such a feature becomes an important didactic resource for the teaching of sciences because antique instruments allow showing concepts of scientific research, methodologies and experimental practices hidden in the modern ones.<sup>3</sup>

Our proposal is that the Museum collection of artefacts, submitted to an accurate museographical plan, becomes instrumental and complementary to the contents and materials previously worked and elaborated in classrooms. There are lots of instruments that allow creating scientific activities that relate our daily life with science and history. It seems important in this way not to take scientific commodities for granted, but to take advantage of every raised question to develop tasks related to methodologies of scientific research and production or features of scientific terminology. It is possible to hold, in an eclectic way, some of the museographical forms of showcase museum exhibits by merging them with key aspects developed recently in science or health centres.<sup>4</sup> So, beyond the aesthetic attraction of antique scientific instruments, the idea would be a museographical combination of *look at this* and *touch this* that permits obtaining first-hand experiences and provoking reflection.

### Notes

(1) Bennett, 1997; Taub, 1998; Bragança, 1999; Álvarez Lires, 2000; Cuesta, 2002.

(2) Pinch, 1992.

(3) Bertomeu & García Belmar, 2002.

(4) Wagensberg, J. 2000.

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## **Parallel Session 20: Museums and Science Centres in the transmission of cultural diversity**

### **PROGRAMS OF SOCIAL PARTICIPATION OF THE SCIENTIFIC OBSERVATORY OF THE MEDITERRANEAN CITY**

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#### **Abstract**

The Scientific Observatory of the Mediterranean City (SOMC), the program of public communication of Science leded from the Science Centres and Museums of Catalunya, promotes projects to introduce science to all audiences, using new technologies and background experience of traditional museums.

Three successful projects have already started:

1. Medciencies Forum ([www.bcn.es](http://www.bcn.es)). Experts introduce different subjects to promote the participation of online users.
2. laTalaia laboratories. Experimental laboratories to promote the participation of general public.
3. The Scientific Autumns of Barcelona. Online and live activities around a given subject to promote the participation of general public as well as scientific discussion.

**Key words:** Public Understanding, Science Museums, Citizen participation

#### **Text**

##### Context

The Scientific Observatory of the Mediterranean City (SOMC) is the program of public communication of Science, leded from the Science Centres and Museums of Catalunya, using the new technologies of information and communication.

##### Objective

The SOMC wants to promote interdisciplinary projects to introduce science to all audiences to help science museums to become a reference centre of science learning and interpretation.

##### Methodology

Different agents of our society- scientists, museum experts, teachers and general public- are encouraged to participate in the projects of the SOMC. The idea is to bring together the new trends in communication and the background experience of the traditional museum, to develop new formats to approach science to the general public. The production of new resources for formal and non-formal education as well as spaces for transversal scientific discussion is also pursued.

#### Results:

Up to now three main projects are already working which have been proved as successful tools to articulate the science communication action from different science centres. The participation of students and general public has fulfilled initial expectations.

1. The online forum in Medciencies ([www.bcn.es](http://www.bcn.es)).

Three different subjects are proposed each year, introduced by short texts and questions by experts. The participation of all internet users visiting Medciencies is the final objective. Up to know five different forums have already been proposed about physics, obesity, Earth's climate, biodiversity and evolution.

2. The laboratories in laTalaia, the digital scientific bulletin

Experimental laboratories to be performed at home or in the colleges are proposed by teachers and educators. The participation of students and general public with science curiosity is the final objective. Up to now 16 different laboratories have been proposed, one at each edition of the digital bulleting, covering all science subjects. The bulletin has already more than 1,500 subscribers, many of them from professionals and people interested in science education.

3. The Scientific Autumns of Barcelona.

Online and live activities are proposed, around a different subject each year, to allow the introduction of general public to a given subject as well as the scientific discussion from different approaches. Up to now, two editions have taken place, one about biodiversity and another about evolution. The participation of museums, research and scientific communication groups is achieved by their collaboration in the organization. More than 20 different institutions have participated in each edition and the SOMC is working to increase this number in the coming edition. The participation of general public is achieved by concentrating the live activities during the Science Week of the city and through the online services of the Observatory. Around 1,000 people have participated in the live activities in each edition and a much larger number in the online activites (taking into account the number of visits of our web portal, more than 140,000 during 2003, a number that has been increasing since the activity of the SOMC started)

#### Conclusions

The Scientific Observatory of the Mediterranean City has started specific programs to promote the researches and collections of the catalan museums, as well as the researches performed in universities and other scientific centres.

Three different projects are already working, which have achieved an important participation of different sectors of the population.

### **Notes**

The web portal of the SOMC can be found at [www.bcn.es/medciencies](http://www.bcn.es/medciencies). All the contents have been developed by the team of the SOMC with the collaboration of many scientists, teachers and museum experts (among others). New products and contents are being developed and will enriched this portal in the near future.

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**STRATEGIC PARTNERSHIPS BETWEEN MEDIA AND SCIENCE CENTRES :THE FLANDERS CASE**

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**Abstracts**

Science centres are among the important actors in science communication. To fulfil their mission, they use different channels. Some of these, print and broadcasting are the core business of the media. To serve large audiences, the media are in search of content. Science centres - having content - look for large audiences. Science centres can deliver high-value content, a chance to physically meet the audience. Media can deliver efficient channels to the public. Technopolis has developed strategic partnerships with different types of media in Flanders :examples prove these to be very successful resulting in a real win-win-win (centre, media, public)

**Key-words:** science centres, media, popularisation

**Text**

Flanders has one science centre, Technopolis. It opened in 2000, and is already one of the international reference centres. Technopolis offers 260 hands-on exhibits, plus temporary exhibitions, shows, demos, an automatic theatre, all interactive and close to everyday life. Next to this Technopolis organises various outreach activities.

But how to reach the target groups?

Marketeers advise to pay attention to the 4P's: Product, Place, Prize and Promotion.

To product, place, prize and promotion, Technopolis adds a fifth P: Partnerships. In order to serve a large audience, the media search for content. While science centres have content, and search for a large audience. Both parties can cater to each other's needs. Science centres can deliver high-value content, an aura of trustworthiness, a place to physically meet the audience. The media can deliver an efficient channel towards the broad public. Both can offer each other a strong brand to be associated with. So why not become strategic partners?

In a well chosen partnership, the science centre finds a series of advantages: an instrument for product placement; a long term engagement with constant repetition of its message and editorial space in stead of advertising space. At the same time one must pay attention not to compromise on the content.

The arrangement is advantageous to the media too: they receive dependable, high quality content; tone up their image and credibility; get a location for

recording and broadcasting and get a physical location to organize events. But the public also wins : it is better served, in an integrated and consistent way. So a strategic partnership in science communication is a Win-Win-Win: both partners are better off, and the public gets better informed.

Technopolis has several of such strategic media partnerships. For instance with the national radio station Radio 1. Technopolis offers visibility and a location for live-programmes and special events for listeners, the radio station offers media space. For a popular radio programme where the public helps answering questions related to science and technology, Technopolis offers content and location, and is present in the programme in an editorial way. The hosts of the programme are godparents of the Technopolis hot-air balloon. When the producers of the radio show wanted to derive a book of it, they got the know-how of Technopolis, and its credibility, in exchange for visibility on the book cover and presence on the air. The book was an instant bestseller. The publisher of the book, Roularta, used a popular exhibit of Technopolis to enliven its stand at an important book fair, while Technopolis used this to 'edutain' the numerous visitors of the fair.

The TV show Hoe?Zo! (How's That? That's what!) is shot in Technopolis. Technopolis delivers scientific advise and some content; in return it receives prime time visibility and promotion (during trailers). The show has a market share of 42% and a rating of 8.5/10. When the show was looking for young co-hosts, Technopolis offered the location for the casting. With animation Technopolis made an event out of the casting. In return Technopolis got promotion on screen during the calls for talent, and a large number of young visitors during the resulting Hoe?Zo! day.

The children's television programme Curieuzeneuze (Nosey Parker) on everyday science was launched by Technopolis: a school class asks a question - e.g. why does hair turn grey? - and presents the answer, and their search for it, on TV. Technopolis delivers content, produces the video material and gets back visibility. From the start Curieuzeneuze was the most popular programme on the kids channel. In the meantime, science is promoted as interesting, research as rewarding.

A leading national newspaper, Het Nieuwsblad, made an exhibit with Technopolis: the visitor produces a personalised newspaper front page. Technopolis gets media space in the journal. The journal has a market share of 41%.

Two regional newspapers receive from Technopolis free scientific content for their Questions & Answers column. These newspapers have a market share of 30.5%.

A leading publisher of educational books, Kluwer, used input from Technopolis to enhance the appeal of a school book on technology. Technopolis got product placement, a good link into schools and another channel to deliver its popularising message.

Together with another publisher, Davidsfonds, Technopolis uses its popularisation and scientific know-how for co-editing of a youth encyclopaedia on communication; Technopolis again gets a novel channel and visibility.

The Flemish monthly science magazine Eos gets from Technopolis a location for its events. It offers media space, and free copies of the magazine for Technopolis visitors.

Another publishing company, Averbode, with a market share of 65% in school weeklies, gets from Technopolis content and a location for events; it gives editorial space in return. The same publishing group runs Kidcity, a leading website for kids. Technopolis brings in the content for the scientific part of the site, and it gets an electronic channel and an audience in return.

In all of the mentioned cases, both partners were better off. Technopolis always pays attention to the balance of offer and return, only partners with strong brands or market leaders and doesn't allow any compromise on the content. Finally the public gets better informed. Win-Win-Win, that's called.

**Parallel Session 20: Museums and Science Centres in the transmission of cultural diversity**

**COMMUNICATING SCIENCE AND TECHNOLOGY THROUGH A  
TRANSPORT MUSEUM IN SOUTH AFRICA'S DIVERSE  
COMMUNITIES.**

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**Abstract**

The cultural institutions through which science is communicated are reflective of our cultural and historical diversities. Public communication of science and technology will be effective as long as these diversities continue to be reflected. South Africa is most probably among the few countries in the world where these diversities have been enshrined within the context of the modern constitution. The Proposed National Museum of Transport is an attempt to utilize this nationhood through public communication of science and technology.