

► US government, combined with the mounting security investigation into his background, was what prompted him to flee. The timing is persuasive: the day the news of the suit reached Europe, Pontecorvo set his plans for defection in motion.

Turchetti is critical of contemporaneous media accounts and later books that allege Pontecorvo was a spy; some are based on recollections of former agents of the Soviet security service. Decades on, there is no firm evidence to support the allegation.

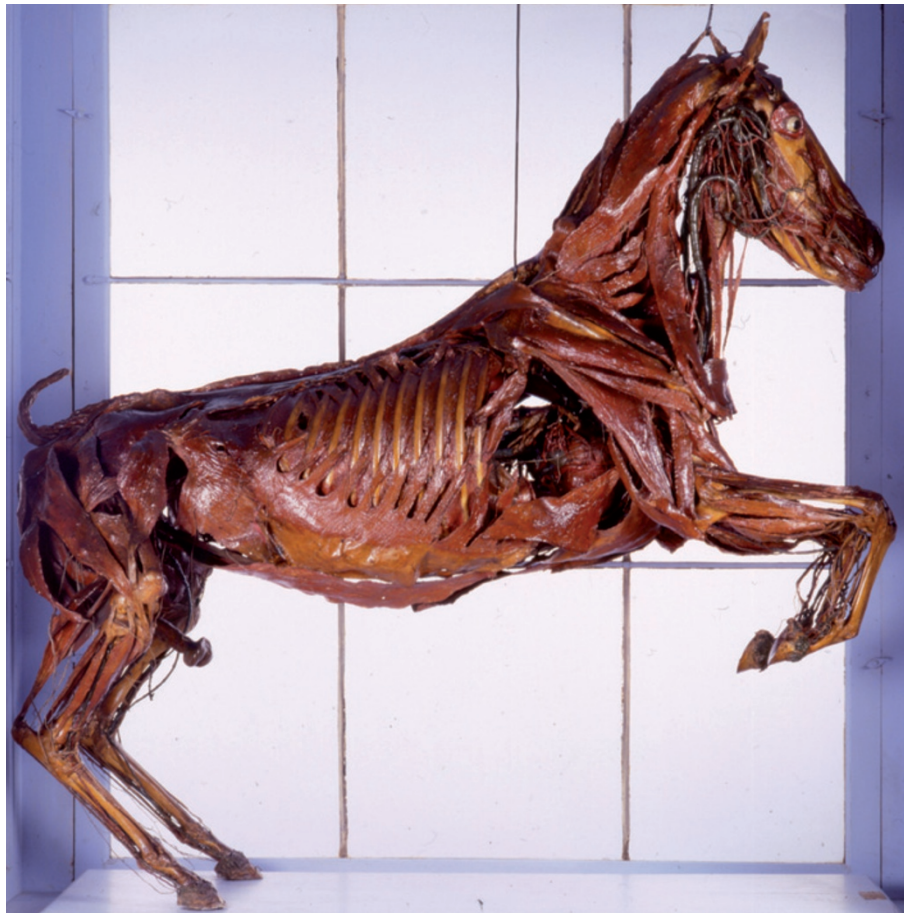
What did Pontecorvo offer the Soviet atomic weapons programme? Here Turchetti speculates, based on what is known. After his defection, Pontecorvo worked at the Dubna Institute for Nuclear Research near Moscow (now the Joint Institute for Nuclear Research) — ostensibly only on civil nuclear science. Turchetti argues that, in reality, his expertise would have allowed him to make important contributions to the Soviet atomic bomb without necessarily working on secret projects. In particular, Pontecorvo's geophysical expertise may have helped the Soviet Union to gain access to uranium reserves, which were in short supply in the 1950s.

Today, neither the Russian archives nor those of the US Federal Bureau of Investigation on Pontecorvo are open. Such secrecy tells us much about those times and about the post-cold-war mindsets on both sides of the fence, which remain riddled with paranoia. The allegations of espionage levied in 1999 against Wen Ho Lee, a Taiwanese-US scientist working at Los Alamos National Laboratory in New Mexico, demonstrate how those fears continue to guide, and misguide, investigations of such claims.

Wen Ho Lee was exonerated of espionage. Pontecorvo — who died in Russia in 1993, deeply disillusioned with communism — remains in posthumous limbo.

One thing is clear. If Pontecorvo was not a spy, and his defection was based simply on fear of persecution and a preference for life under communism, he made a poor choice. In the West during the cold war, scientists lost their jobs amid witch-hunts, but in the Soviet Union, at least under Joseph Stalin, the outcomes were more dire. Nothing in the book illustrates this better than Stalin's comment on a proposed conference organized by nuclear physicists: "Leave them in peace, we can shoot them later." ■

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A dynamic eighteenth-century exhibit of horse muscle anatomy from Pavia's Museum of Natural History.

MUSEUMS

Stripped assets

Paolo Mazzarello argues that the disposal of collections requires clear consultation with the public.

Museums are facing a sort of Malthusian constraint — an explosive increase in the volume of their collections, coupled with a severe reduction in funding, fuelled partly by the current economic crisis. Collections cannot be increased indefinitely and sustained forever. So what happens when a saturation point is reached?

The Museum of Natural History at the University of Pavia in Italy is an example of how things can go wrong at such a tipping point. Founded by naturalist Lazzaro Spallanzani in the eighteenth century, the museum was dismantled in the 1930s in the face of financial and other pressures. The collection — including some of the first animal specimens preserved by taxidermy — was then dispersed across a number of sites in Pavia and the surrounding area.

This was an extreme solution, but museums must evolve. The goal of museums, to

safeguard the evidence of important changes in the history of the planet and humankind, is an endless task. In response, they must be dynamic places, where the acquisition of objects is balanced by the planned deaccession or disposal of others.

Such an activity is at odds with the fusty image of a museum as a place where items are preserved in display cases or kept in storage. However, the disposal of materials demands care: whether justifiable or not, it is often highly controversial and can devastate an institution's image. From small civic archives to the vast Prado in Madrid, museums are the repositories of our collective past and identity, and that makes any broad discussion of disposal problematic.

Careful accession and deaccession policies are becoming increasingly important

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elements of museum management, whether local, regional or national — particularly in the current climate of reduced funding. In Italy, these policies are crucial. The country harbours 47 World Heritage sites, more than any other nation, and is home to 4,000 publicly registered museums, including some of the most important art collections in the world. But funds are shrinking, to the point at which the existence of some museums, and some of the country's most famous works, hangs in the balance. For example, in June it was discovered that Raphael's masterpiece *The Marriage of the Virgin* was endangered by water seeping through the walls of the Brera Art Gallery in Milan, owing to a lack of routine maintenance.

Yet strategic disposals, including long-term or even indefinite loans of museum pieces, are not being seriously considered by museums worldwide as a way to cope with the costs of maintaining full public collections. Museum authorities in Italy, as in many other countries, have elected to adopt such measures as reduced visiting hours rather than consider the disposal of selected holdings publicly and openly — perhaps fearing a public backlash. This is not, of course, to suggest that museums should sell holdings simply to cover the costs of routine maintenance; but it may be necessary for some to be realistic and open about the size of their holdings and the number of pieces that can be successfully exhibited.

To achieve a balanced ebb and flow of pieces in museum collections, the phases of accession and disposal need to be carefully evaluated and managed. Traditionally, curators tended not to limit the inflow of items — in some cases coming to resemble compulsive hoarders. Today it is common for curators, applying narrower and more demanding criteria in their selection of accessions, to refuse 90% of the offers made.

Although most donations may be turned down without damaging the public perception of a museum, disposal of materials that are already held is a different matter. In the United Kingdom in 2009–10, for instance, public outcry halted Southampton City Council's attempt to sell works by sculptor Auguste Rodin and British artist Alfred Munnings in order to raise money for a new museum dedicated to the RMS *Titanic*. Competing resources, and debates over the relative significance of pieces or collections, form just part of the criteria for deaccession. The views of museum audiences need to be factored in.

Debates over deaccession and disposal should be conducted transparently, accompanied by a clear public explanation and rationale, and should involve the views of all stakeholders — from museum staff to local authorities and concerned individuals. This way, the public's sense of ownership of prized local collections can be honoured.

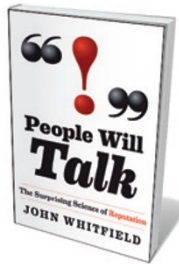
In the 1980s and early 1990s, Canada's ►

Books in brief



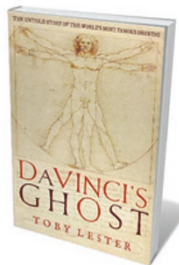
In the Field, Among the Feathered: A History of Birders and Their Guides

Thomas R. Dunlap OXFORD UNIVERSITY PRESS 256 pp. \$34.95 (2011)
Birdwatching may be an amateur science, but it retains close links to ornithology and conservation. In the century since twitching emerged as a suburban hobby, the one constant has been the field guide. Historian and birder Thomas Dunlap trains his binoculars on its evolution in the United States. His meticulous chronicle reveals how the collective urge to spot Nashville warblers or bald eagles ultimately jump-started the US eco-movement, and why the hobby is one of the great unfolding stories of crowd-sourced nature study.



People Will Talk: The Surprising Science of Reputation

John Whitfield WILEY 272 pp. £17.99 (2011)
Reputation is central to our lives, says science writer John Whitfield, yet we are not entirely aware of it. He draws on philosophy, sociology, economics and animal-behaviour experiments to punch through the surface of this powerful and perplexing phenomenon. At base, he finds, it rests on how we trust others and how we persuade others to trust us. An individual's concern for his or her reputation can be a fulcrum that tips them towards either brutal or altruistic behaviour — so ultimately, says Whitfield, the way in which society uses reputation determines whether that society thrives or fails.



Da Vinci's Ghost: The Untold Story of the World's Most Famous Drawing

Toby Lester PROFILE/FREE PRESS 263 pp. £16.99/\$26.99 (2011/2012)
Leonardo da Vinci's *Vitruvian Man* — poised within a circle and a square — is arguably history's most iconic image. Writer Toby Lester offers the absorbing story of this Renaissance rendering. Touching on anatomy, medicine, geography, mathematics, philosophy and aesthetics, he explores the idea that the body, geometry and mystic reality are linked. Its progenitor was Roman architect Marcus Vitruvius Pollio, who posited that human proportions echo the cosmos and should set the form for architecture and for all civilization.



Time Travel and Warp Drives: A Scientific Guide to Shortcuts through Time and Space

Allen Everett and Thomas Roman UNIVERSITY OF CHICAGO PRESS 280 pp. \$30 (2011)
Physicist Allen Everett and mathematician Thomas Roman boldly go into the big speculations that lie at the root of 'frontier science', such as time travel. Through clear explanations and judiciously deployed basic algebra, they lay out the science behind the weirder possibilities offered by the characteristics of space-time. Travelling backwards in time, for instance, can be linked theoretically to moving faster than the speed of light. Warp bubbles, anyone?



Panda: Back from the Brink

Zhou Mengqi SARABAND 192 pp. £25 (2011)
The one-note diet, monochrome markings and long association with fertility treatments in captivity lend the giant panda an unreal air. But these animals are resilient: against all the odds, they total an estimated 2,000 individuals. This tribute to the beauty of the beast is informed by leading conservationists, but centres on stunning shots by photographer Zhou Mengqi. Backed by advice from panda experts Zhang Zhihe, Zhang Hemin and Hu Jinchu, Mengqi tracked his elusive subjects through the mountains of Sichuan for years.

► Glenbow Museum in Calgary, Alberta, successfully used such a process to transfer or sell around 30,000 inherited objects that were no longer relevant to its mission. This large-scale, strategic disposal of objects, including texts and ethnological and military-history collections, allowed the museum to sharpen its focus and release resources for other core sections. Importantly, the move was recognized as valid by the public. The distribution of pieces also boosted the value of the collections they joined.

Deaccession is never simple, and is not to be undertaken lightly. Hastily conceived action could mean big losses for future generations. But meticulously planned disposals for the right reasons are preferable to the disposal of an entire collection, as has happened in the past.

Happily, such disposals may not be the final curtain in every case. Spallanzani's great museum in Pavia may have a future. The collection — a once-cherished jewel of our city and country that has lain dormant for more

than 70 years — was only disbanded, not permanently disposed of. We, at the University of Pavia, are about to begin the process of reconstituting a great part of the original collection for eventual display here, to grant a future to a vital window onto the past. ■

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CHEMISTRY

An elemental heroine

An opera on the astonishing life of Marie Curie entralls **Stefan Michalowski** and **Georgia Smith**.

Marie Curie's life seems to be ready-made for grand opera: the brilliant heroine who overcomes poverty and prejudice to marry her soulmate and work with him as an equal, winning a Nobel prize. Then, the tragedy of her husband's accidental death, the scandal of her affair with a married colleague, a second Nobel, heroic war work and her own sad death caused by years of exposure to radiation. Now it is indeed an opera: Polish composer Elżbieta Sikora's *Madame Curie* premiered in Paris on 15 November, and was performed in Gdansk, Poland, on 23–26 November.

Director Marek Weiss brought a full orchestra, cast and chorus from the Baltic Opera of Gdansk to the headquarters of the United Nations Educational, Scientific and Cultural Organization (UNESCO) in Paris for the opening, as part of the International Year of Chemistry.

Sikora's work has been widely performed in contemporary-music venues. She has written large choral pieces, but her two previous operas are on a smaller scale than *Madame Curie*, which has a big, ambitious score that is as precisely wrought as a chamber work. The music is atonal, but is full of attractive melodic structures.

Intriguing orchestral textures are seamlessly integrated with pre-recorded electro-acoustic segments, which Sikora created in collaboration with Argentinian composer Diego Losa. Conductor Wojciech Michniewski elicited a fine performance from the orchestra and chorus in Paris. The cast of fresh-voiced young singers acquitted themselves well, particularly soprano Anna Mikołajczyk as Marie.

The opera does not delve into Curie's scientific discoveries, nor does it try to depict



Soprano Anna Mikołajczyk as Marie Curie.

the excitement that gripped the research community during the birth of subatomic physics in the early 1900s. Sikora said in a pre-show interview that she “was looking for a strong woman character”, and although the stage set is the Curies' rudimentary laboratory, it is Marie as a heroic woman that we see, rather than Marie as a brilliant scientific mind.

As the opera opens, she enters in her nightgown, reading a letter from the Swedish Academy that asks her not to come to Stockholm to accept her second Nobel prize because of the public scandal about her affair with physicist Paul Langevin. The rest of the opera is a succession of scenes from her life,

Madame Curie
COMPOSED BY
ELŻBIETA SIKORA;
LIBRETTO BY AGATA
MIKLASZEWSKA
UNESCO Headquarters,
Paris.
15 November 2011.

presented with little or no visual demarcation. Weiss explained in an interview that he envisioned the opera as a dream that Marie has after receiving the letter. This didn't

come across clearly on stage, however, and at first the plot was confusing. But once the spectator gets used to the impressionist-fantasy narrative style, it works.

Weiss has created several beautifully effective scenes, notably Marie's grief after Pierre's death, a comic duel over the Langevin affair, and scenes in which the chorus plays a fickle public vacillating between idolizing Curie and despising her. The finale is particularly powerful: as the orchestra builds a stunning crescendo, Marie hobbles from the stage supporting the lifeless body of a dancer who has been her symbolic double throughout.

The music for the voices spans the spectrum from intense lyricism to plain speech. Marie's aria lamenting Pierre's death, movingly performed by Mikołajczyk, is a striking combination of late-Romantic aesthetic articulated through the idiom of contemporary music. Sikora has a flair for the sudden quiet of instrumental solos: one dance sequence is accompanied only by a long, ravishing clarinet solo. More such moments might be welcome in what is otherwise a relentless pattern of repeated, hard-hitting climaxes in both drama and music.

There is one serious disappointment in the way this story is told. Directly after the overture, an aged man resembling Albert Einstein appears to Marie. He warns her that devastating consequences could result from her work, and urges her to stop. A video projection of a mushroom cloud rams home the point.

Marie shakes off this vision, insisting on the necessity of pursuing the truth. But associating Curie with nuclear weapons is untenable — the relevant discoveries were made shortly before and after her death. Attributing the ethical choices of later scientists to her makes no more sense than the dismissive sexism she endured during her lifetime. ■

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