

created separately, and Asa Gray, who believed fervently in both Darwin and Christianity. The book is so rich in details — church meetings, fossil hunts, ocean voyages, hikes, courtroom dramas and Victorian hypocrisy — that it reads like a novel. But the narrative drive is weak: it is often hard to see where the story is going or why. That, I guess, is reality.

It is also not obvious why the book culminates with much hyperbole in the eponymous banquet. This 12-course meal, with a separate wine for each course, was held at a famous Manhattan restaurant shortly after Darwin's death. It was attended by 200 of the most powerful men in the United States, and celebrated Spencer at the end of what was to be his last US trip. The build-up to the meal is tremendous, and we are treated to all the procedural details — course three of the first service included buttery, scarlet kettle-drum-shaped pastry tufts stuffed with truffles, tongue and pistachios — and there is a very full summary of the three hours of after-dinner speeches. The book's cover claims that this event was "a historic celebration from which the repercussions still ripple throughout our society". But I now understand why I had never heard of it. Spencer himself found the speeches boring and wanted to leave early. The audience found a new idea only in John Fiske's speech: he asserted that humans acquired a sense of morality not from God, but from natural selection. The only speech that might



Herbert Spencer felt evolution could cure social ills.

resonate today was Spencer's own. Worried about the country's well-being and health, he railed against the national work ethic, arguing that Americans should spend less time striving for a future good, and more time enjoying what the passing day had to offer. The idea baffled his audience and was poorly received.

Yet the narrative non-fiction genre allows unexpected things to emerge. Many of the protagonists were, like Darwin, bedevilled by bad health. Doctors are summoned at a frightening rate throughout the book. The ailments were many and the treatments fascinating — at one point, Agassiz was forbidden from thinking. That natural selection should have excised such sick men does not seem to have caused much concern among any of these social Darwinists. Moreover, neither Spencer nor any of his US

disciples seems to have spent any time trying to push evolution into medicine, even though medicine was becoming a serious scientific enterprise, with the verification of the germ theory of disease and the developing cellular theory of disease (now pathology). Even today, medicine is the most obvious area in which evolutionary biology remains under-extended. Mutation, competition and selection are key to understanding cancer and infectious diseases, for example, but still very few medical schools teach evolutionary biology.

We have yet to fully comprehend the consequences of what Darwin did to humanity's view of itself. Werth's picture of what his 'great minds of the gilded age' were thinking, of how far they tried to stretch Darwinian insights, and of the personal and moral lessons they drew, makes a forceful argument that the causes of biological diversity — and humankind's place within it — really matter. The fact that many of these thinkers' conclusions were based on such a poor understanding of evolution also shows why everyone deserves proper schooling in evolutionary biology. The Victorians had the crippling disadvantage that they did not understand inheritance or units of selection. Today, humanity has no such excuse.

**Andrew F. Read** is professor of biology and entomology at Pennsylvania State University, University Park, Pennsylvania 16802, USA. e-mail: a.read@psu.edu

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## Portraying the embryo

### Making Visible Embryos

by Tatjana Buklijas and Nick Hopwood  
Exhibition at <http://tinyurl.com/9m8s7u>

"Do we not find a rosebud as beautiful in its own way as a rose?" mused the great German anatomist Samuel Thomas Sömmerring. He was defending his revolutionary work, published as a series of large-format plates in 1799, showing that embryos took different forms at different stages.

The story of how embryos have been depicted is the subject of the online exhibition *Making Visible Embryos*, by historians of science Tatjana Buklijas and Nick Hopwood.

Before Sömmerring, anatomists adhered to the Aristotelian theory that the individual adult was present in the germ cell, and simply grew in size — no rosebuds, just small, perfect roses. The debate was only whether the homunculus was encapsulated in the egg or the sperm. The concept of the embryo as an unformed blob did

not fit with theories of the Creator's perfection.

Then experimentation took over. Human embryos were in short supply, but Sömmerring systematically acquired them from abortions, picked out the best examples, which he assumed to be less malformed, and drew his own conclusions.

The exhibition of more than 120 images, from engravings and wax models to X-rays and ultrasound scans, presents how scientists have struggled to understand the embryo in its biological and moral contexts. We learn how Jesus was often depicted as a small but fully formed child in the womb of the Virgin in medieval and early-modern paintings. We learn how German experimental zoologist Ernst Haeckel, one of Charles Darwin's most insistent propagandists, used his considerable

artistic skills to present images of developing embryos — and massaged some to support his theory that different species pass through similar embryonic stages. And we discover how the emotionally powerful images of Swedish photographer Lennart Nilsson were, ironically, taken from aborted fetuses. In the 1960s, these photographs influenced the modern public view of the fetus as a child waiting to be loved, and thus fuelled the fire of anti-abortionists.

The website is structured by theme; each section runs chronologically and information is provided at three levels of depth. This architecture mostly works well. But it is less suited to complex discussions, such as the nineteenth-century scientific controversies over embryology, in which it is easy to lose track of the different players, their arguments and how it all fitted together. But the pictures speak volumes, even though images of the embryo are nowadays commonplace.

**Alison Abbott** is Nature's senior European correspondent.



Scientists initially struggled to grasp how embryos develop.

ANATOMISCHES INSTITUT, BASEL