

that living systems are made up of discrete compartments that he called cells. And looking down another microscope in the early nineteenth century, botanist Robert Brown saw pollen grains that were “evidently in motion”. When further experiments showed that the movement was not the result of some sort of life force, he realized that he was observing a general property of finely divided matter. His observations of ‘brownian motion’ — the result of collisions between dynamic particles — were later to be interpreted by Einstein in his doctoral thesis,

work that laid the foundations for quantum theory. It is compelling stuff.

So is this book a perfect work of science? Perhaps almost so, although at first sight a biologist might not think so. Nelson’s book makes frequent use of drawings of biological structures, notably many by David Goodsell, including his famous image of a ‘crowded cell’. By contrast, most modern biology texts, even relatively inexpensive ones, have been transformed by the power of modern microscopy and sophisticated molecular-graphics programs.

Still, the handful of colour pictures in this book demonstrate that one of the many attractions of living systems is frequently their great beauty. And simple observations of biological systems have long influenced the progress of physics: after all, the moving object said to have triggered Newton’s understanding of gravity was undoubtedly of biological origin. ■

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## Theatre

# A stage of evolution

## The Darwin Variations

by Jean-François Peyret & Alain Prochiantz  
Performed in French at the Théâtre National de Chaillot, Paris, until 18 December 2004.

### Laura Spinney

Darwin’s theory of natural selection has been handed down to us as the broad vision of a brilliant man, meticulously researched, comprehensive and self-assured. We hear less about his doubts, his procrastination and anguished discussions with contemporaries. Nor is it well-known that, in confronting the implications of his theory, he made himself ill. “I’m sick to the stomach,” he confesses at times throughout *The Darwin Variations*.

This play sets the science in the context of the man and his time. The process of publication tends to strip away all the emotion, poetry and music of a discovery. So Alain Prochiantz, a developmental neurobiologist at the Ecole Normale Supérieure, Paris, and theatre director Jean-François Peyret have set out to recreate it. They have given Darwin the poetic licence that Ovid took for granted when he wrote his poem *Metamorphoses*. Like Ovid, the actors in *The Darwin Variations* are free to imagine the future transformation of humanity — even a humanity that takes charge of its own evolution. Their musings intertwine with Darwin’s in a dialogue that takes in old and new ideas, about where to draw the line between man and animal, and about consciousness, genetic engineering and interfaces between brain and machine. Over all of this hangs the threat of the inevitable conclusion: that there is no grand design, no notion of perfection to which evolution is propelling us.

This conclusion is embodied by the action on stage. This is theatre of the absurd, where nothing happens for a reason. Actors move about in a disconnected way, apparently oblivious to an off-stage dialogue. The speakers are invisible, but their voices seem to press in on the set, clamouring to be let in. Every so often they succeed, and the actors respond.



*The Darwin Variations*, featuring Irene Jacob (right), ponders the future transformation of humanity.

The curtain rises, for instance, on an empty stage. Two actors appear, wearing dark glasses, carrying a bench, a pebble and an egg. Off stage a blind man on his deathbed debates the existence of God with a priest, based on their different experiences of the natural world. The conversation shifts, and the question becomes whether, given a choice, a blind man who knows the world by touch alone would choose to have eyes or a longer pair of arms. Just then, one of the blind men on stage throws up the egg, and the other catches it in mid-air.

In another scene, a woman sitting on a bench, cutting up newspaper, asks the man beside her if contempt is expressed by a slight pouting and a flaring of the nostrils with a small expiration — one of Darwin’s observations from his book *The Expression of the Emotions in Man and Animals*. The man doesn’t respond. She asks him, indignantly, if the expression for disgust resembles that

of someone about to spit. He gazes off into the distance. Enraged, she threatens him with her scissors. His face contorts, he throws himself at her, and the scene ends in a fight to the death.

The play is funny, original and anything but didactic. It takes familiar ideas and pursues them through their serious implications *ad absurdum*. The third in a trilogy based on metamorphoses, *The Darwin Variations* is, in a sense, a product of evolution itself. The actors began with a script and moulded it into a piece of theatre, according to their own continuously evolving ideas. It will probably continue to evolve through its run at the Théâtre National de Chaillot in Paris. Those attending on the last night may see something quite different to those present at the opening — not necessarily any better or worse, just different. ■

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