Moving from simple to complex

Neuronal Control of Locomotion: From Mollusc to Man

by G. N. Orlovsky, T. G. Deliagina and S. Grillner

Oxford University Press: 1999. 322 pp. £49.50

Nicholas Dale

The triumvirate of Orlovsky, Deliagina and Grillner is uniquely placed to produce a unified account of the neural basis of locomotion across the whole animal kingdom. Their collective experience in the field of locomotor control spans more than 30 years. All have made major contributions to understanding the control of movement in the cat, before moving to simpler preparations in search of more detailed understanding.

In surveying this vast field, the authors systematically describe the mechanisms underlying locomotion in a range of invertebrate and lower vertebrate preparations, moving to a detailed account of mammalian locomotion. The book's great strength is that, for each preparation, it starts with the basics and leads the reader to a fairly good understanding at the levels of systems and networks. By drawing parallels and contrasts between work done in different preparations and contexts, the authors avoid compartmentalizing the field. For example, they highlight the parallels between the mammalian and arthropod limb controllers, and describe clearly the problems of effective locomotion and the strategies used by the nervous system to overcome them.

There is a lack of simple diagrams that would have made some ideas more accessible. Nevertheless, this is an excellent book for those seeking wide background knowledge of neural mechanisms underlying movement. Those already in the field will also find it valuable. At times, however, there is a lack of balance. Perhaps understandably, the authors' own work receives detailed treatment. But this comes at the price of incomplete coverage of more recent developments in neuromodulation and the contribution of ion channels to network function. The chapters on mammalian locomotion concentrate almost exclusively on the cat, with only a passing mention of findings in the rat. The mouse and rat will surely be important models in the post-genomic era, and deserve fuller treatment.

Nevertheless, while it is easy to criticize the difficult choices inherent in writing this book, the authors have succeeded in illustrating the progress that has been made by studying simple systems, and how this illuminates the principles underlying locomotion in more complex animals, including man. ■

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Science in culture

Photography and the artist

"Degas to Picasso: Painters, Sculptors and the Camera", a travelling exhibition

Marina Vaizey

This major exhibition juxtaposes photographs as they were actually taken, or found and used, with original paintings, sculptures, drawings and prints by 14 European artists from the 1860s to the first decade of the twentieth century. The purpose is to demonstrate the complex relationships between the mechanically taken image and the image created manually by the same artist. The relationship may be direct, as when the Norwegian expressionist painter Edvard Munch based painted compositions directly on photographs, or oblique, as when the *intimiste* painter Edouard Vuillard, enthralled by his Kodak, took countless photographs of his friends, family and milieu, which informed his paintings without being directly used (see above).

Curiously, the American, Thomas Eakins, who was so resonantly involved with photography, not only taking his own photographs but also working directly with Eadweard Muybridge, the pioneer of action photography, is omitted. This is evidently because a thesis of the compilation is that photography was as important for symbolist aesthetics as for nineteenth-century realism. But the importance of photography for a hugely stylistically and philosophically diverse group of artists has been known since the relationship between the photographer and the painter was first studied seriously some 40 years ago. And such an omission throws up another problem: the quality of the artists on display is so uneven that the compilation at times lacks gravitas.

What, however, does this exhibition show us, and the expansive accompanying publication of the same title (Yale University Press, \$50, £35) tell us, about the artist and the camera? The main point for all those who are sceptical about photography is how much more it is than a mechanical tool. Light is shed on the work of each artist merely by absorbing what photographs they chose as inspiration, *aide-mémoire*, or sketch and what kind of photographs they themselves took. The two best-known artists under examination, Edgar

Edouard Vuillard used his photograph of Misia Natanson (left) indirectly in his painting *Mother and Child*.

Degas and Pablo Picasso, had a complex relationship with photography which has only recently come under sustained scholarly scrutiny. The exhibition gives a succinct presentation for Degas. His favourite subjects included horse-racing and ballet dancers, and Muybridge's photographs of horses in motion and dancers in movement, from his famous publication *Animal Locomotion*, are included next to Degas' own sculpture of horses and paintings, sculptures and drawings of dancers.

The representation of each artist and related photographs is necessarily thin, and the reading matter required, in terms of effective exhibition design and display, excessive. Not for the first time do we find a far better and more interesting publication than exhibition.

In 1839, the French artist Paul Delaroche, perhaps the most influential depicter of historical scenes in the Europe of his period, rather dramatically announced that, with the invention of photography, painting was dead. Far from it: the camera simply became one more weapon in the armoury of the painter and sculptor. Not only have artists quarried the riches offered by the photographic image, but the techniques of photography — for example, the cut-off figure so characteristic of the snapshot — have been reinterpreted in paint. Moreover, artists rapidly adopted photography as a new kind of sketchbook. It has been argued that photography was also responsible, because of its apparent ability to portray the external world objectively, for allowing the horizons of painting and sculpture to expand into abstraction. This seemingly new vocabulary of forms has been called the non-objective world, that is, the world of the imagination rather than that perceived by the senses. ■

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The exhibition is at the San Francisco Museum of Modern Art, San Francisco, California, until 2 Jan. 2000; at the Dallas Museum of Art, Dallas, Texas, 1 Feb. – 7 May; and at the Guggenheim Museum, Bilbao, Spain, 12 June – 10 Sept.