Baby love

Cruel experiments on monkeys showed that infants need affection.

**Love at Goon Park: Harry Harlow and the Science of Affection**

by Deborah Blum


Alison Jolly

"You cried and cried and cried, and I wanted so much to comfort you, and I knew that I just mustn't pick you up and hold you. That's what they told me, so I believed them." That was a mother in my own family, apologizing what they told me, so I believed them. "That just mustn't pick you up and hold you. That's so much to comfort you, and I knew that I"You cried and cried and cried, and I wanted to associate his mother with milk. Overmothering was thought to produce overdependent offspring. With the dawning of an understanding of hygiene, human contact was seen as passing dangerous germs. In families there was usually some compensation, but in hospitals and orphanages, babies could be kept in solitary confinement, away from care-takers and each other. Mysteriously, the infants seemed to lose interest in life, and many died. The remedy prescribed was ever more sterile isolation.

In England, the revolt against this view was led in the 1950s by John Bowlby and James Robertson. Many psychologists, though, saw the campaigners as soft, sentimental and unscientific. It was Harlow's hard science that broke the barriers of doubt. He showed conclusively that baby rhesus monkeys could not be conditioned to love a wire mother, even if she was the one equipped with a milk bottle — they clung to warm cloth instead. They would work to open a window just for a glimpse of their cloth 'mother'. They ran to the cloth mother if they were terrified by something new, such as a wind-up toy bear banging on a drum, and were comforted by 'her' presence. Monkeys raised in isolation, without contact, grew up insane, unable to deal with other monkeys. Some were unable to mate unless fastened in what Harlow, with characteristic bluntness, called a 'rape rack', and then they were likely to abuse or murder the resulting child. Of course it is obvious now. It just wasn't obvious then.

Who should read this book? Anyone working with small children, and many who are raising a small child — and anyone interested in authority in science. They should do so not just because it is beautifully and intelligently written, with a journalist's verve and a professional's attention to source and detail, but because of the questions it raises. How could the people who preceded Harlow have been so wrong? How could the antidote be a man who drove monkeys insane? Science is often blamed for its service to evil societies, Nazi eugenics or the hydrogen bombs of the Cold War, but this is a story of science unconstrained, creating its own perversions. As Harlow put it in 1953: "It is my belief that if we face our problems honestly and without regard to, or fear of, difficulty, the theoretical psychology of the future will catch up with, and even surpass, common sense." Let's hope he was right.

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**Immunology tomorrow**

**Immunology and Evolution of Infectious Disease**

by Steven A. Frank

Princeton University Press: 2002. 352 pp. $75, £52 (hbk); $24.95, £17.95 (pbk)

Franziska Michor & Martin A. Nowak

It was Charles Darwin who observed: "It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change". In the ever-changing world of the immune system, neither size nor complexity of a parasite counts, but adaptability. In Immunology and Evolution of Infectious Disease, Frank's multidisciplinary approach to infection dynamics brings together population ecology, immunology and evolution.

He links evolutionary change of parasites to molecular details of immune recognition and to genetic variation of the host population. Newcomers are offered a comprehensive introduction to basic questions of immunology, as well as a synthesis that cuts across large areas of biology. Specialists will find detailed discussions of specific infectious agents from a highly original, evolutionary perspective, and inspiration for future research.

The structure of the book shows how different subjects must be integrated for comprehensive understanding of parasite variation. First, it gives a general introduction to vertebrate immunity and antigenic variation. There follows a discussion of molecular processes of immune recognition and parasite escape. Frank then focuses on the dynamics of a single infection and examines genetic variation within populations of hosts and parasites. Finally, he discusses methods to study the evolutionary dynamics of antigenic variation. As the book progresses, the complex issues of evolutionary change are related back to the structural and biochemical properties of molecular recognition introduced earlier in the book.

Antigenic variation benefits parasites by
Parasites in general have found an amazing diversity of processes by which they can escape immune recognition. Mechanisms of generating antigenic variation include base substitution during replication, hypermutation of antigenic loci, and switching between archival variants. The analysis of infection dynamics within individual hosts includes hepatitis C virus (HCV), human T-cell leukemia virus (HTLV), and the malaria parasite Plasmodium falciparum.

Frank examines variability in parasites and hosts across entire populations, discussing genetic differences among hosts in their immunoresponses and immunememory profiles. The overview of the methods for studying evolutionary change is exceptional. Immunological and phylogenetic classification of virus variants provides evidence for selection in genetic data of influenza A virus and HIV. Experimental evolution of foot-and-mouth disease virus is discussed, as well as selection for escape from cytotoxic T cells.

This book considers the natural history of antigenic variation at the molecular, population and evolutionary level. Through its novel way of integrating all factors that affect antigenic variation in pathogen biology, it provides new insights into the evolution of infectious disease. It is a rich source of ideas for scientists working in immunology and molecular biology as well as evolution. Frank defines the key problems for the future study of parasite variation and escape from host recognition. For example, he suggests studying experimentally the relations between infection length, parasite abundance and transmission success to learn how selection shapes antigenic variation within hosts.

To determine whether antigenic selection shapes phylogeny, mathematical models can clarify the relations between antigenic and phylogenetic classifications. Comparison of parasites in different hosts or geographical locations can reveal the effects of MHC diversity on antigenic variation.

The book brings home the point that the immunology of tomorrow will greatly benefit from making contact with structural, genomic, evolutionary and mathematical techniques. Academic institutions and granting agencies worldwide have started to predict such a multidisciplinary future for the whole of biology. Read this book and 90% of your multidisciplinary grant on any topic of infectious disease is already written.

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A drink to your health!

Wine: A Scientific Exploration
edited by Merton Sandler & Roger Pinder
Taylor & Francis: 2002. 336 pp. £65, $65

John Mowbray

In a mildly puritanical culture, where indulgence in alcohol causes twinges of guilt, there is a particular delight in finding that a much-used recreational drug may confer health benefits. The critical evaluation of the beneficial and possible deleterious effects of wine and alcohol consumption on humans is one theme of this multi-authored compilation on wine.

The second theme is the scientific basis and evolution of viticulture and wine production. The tale of the infection of European vines by the American phylloxera aphid and the reluctance of the French central authorities to accept the findings of compatriots from the Midi region, as well as the continuing problems with this infestation, make fascinating and instructive reading.

The currently controversial role of biotechnology in wine production and the possible benefits and limitations of genetic engineering are discussed clearly, as is the revolution in identifying the parentage and identification of vine species. The scattered contributions linking the properties of wine to its medicinal effects are covered by chapters on the production and physiological roles of polyphenols and flavonoids in the grape, and by an illuminating and succinct history of wine as a medicine.

Regarding the medical benefits of imbibing wine, there is epidemiological evidence that moderate alcohol intake protects against coronary heart disease, and possibly...