

Readings in Behavior

Collected by John Williamson

PRINCETON, N.J. ELIZABETH GOULD: CHANGING MINDS... This writer and Dr. Prescott have been keenly following the field of neurogenesis for over two decades. About two years ago, we suspected that Tiger Touch's experiment with free ranging was producing new neuronal growth in the brains of our compound cats. We knew that verifying this would make a profound change in the fundamental concepts of animal husbandry, demonstrating a defining paradigm for animal enrichment, aggression, and well being for so many cats in captivity. Moreover, it would also help to advance respect and care for our animal cousins. We are more than excited by a very recent study by Elizabeth Gould of Princeton University. Her work establishes without a doubt that we need to change our thinking, especially with respect to the present limiting notions of "enrichment." We should also take a hard look at what zoo guidelines do to the psychological and physical health and well being of their big cats. It is no less than slow torture they cannot escape, often resulting in psychotic violence whenever opportunity arises.

YOUNG CELLS IN OLD BRAINS... The paradigm shifting conclusion that adult brains can grow new neurons owes a lot to Elizabeth Gould's rats and monkeys. Against a backdrop of tidy ideas about the brain, Gould and her colleagues have been messing things up and, in the process, contributing to some of the most exciting findings of the past decade. Her work -- and that of several other neuroscientists -- has made clear that new neurons are produced in certain areas of the adult brains of mammals, including primates. Moreover, these cells can be killed off by stress and unchallenging environments but thrive in enriched settings where animals are learning, and they may play a role in memory.

A WORD FROM DR. JAMES PRESCOTT (January 2001)... Press release -- December 14, 2000 -- Belmont, MA -- McLean Hospital researchers have identified four types of brain abnormalities linked to child abuse and neglect, providing the first comprehensive review about the multiple ways in which abuse can damage the developing brain. The McLean team identifies four types of abnormalities caused by abuse and neglect. "These changes are permanent," says Teicher. "This is not something people can just get over and get on with their lives." The abnormalities are: Limbic irritability, Arrested development of the left hemisphere, Deficient integration between the left and right hemisphere, and Increased vermal activity, and important toward validating Tiger Touch's position on big cat aggression and dangerousness, the report goes on to say: "We know that an animal exposed to stress and neglect early in life develops a brain that is wired to experience fear, anxiety and stress," says Teicher. Of course, it is fear, anxiety, and stress which drives a big cat to serious aggression against whoever or whatever is in its space.

STRESS AND IMMUNITY by Sara Abdulla, *Nature magazine* "Over the last couple of decades it has become increasingly obvious that beneath the complex molecular and cellular events contributing to the causes and

effects of stress, lies an even more complicated dialogue. A dialogue between two systems, which, for most of the century, had been regarded as autonomous: the brain and the immune system. In fact, the biology of stress could even be said to have spawned a new research discipline focused precisely on this dialogue: 'psychoneuroimmunology'. On a detailed level it is far from clear how the two most intricate and ill-understood systems in the body communicate with one another. But roughly speaking, there is now little doubt that they are inextricably linked via a dizzying mesh of feedback and feedforward loops. The mainstays of the immune system are the bone marrow - that is rich in stem cells (which have the potential to become almost anything the system needs), the thymus - an organ at the base of the neck which produces hormones and white blood cells, and the white cells or 'lymphocytes' themselves. These lymphocytes come in two forms, T- and B-cells, which can be loosely thought of as 'attacking' and 'defending' cells. Both types patrol the body, ready to find trouble and avert it with the help of a fleet of janitor cells called macrophages. All of these first-line immune systems receive inputs from nerve fibers put out by the network - the sympathetic nervous system - through which the brain regulates organs and blood vessels. And many of them produce hormones, or other signaling molecules that interact with the key stress-response areas in the brain."