The Flexible Brain

20 Memories Leave Their Traces
In the early days, only a small path connected the Max Planck Institute of Neurobiology in Martinsried with the outskirts of Munich. Now a huge biocampus is located on the periphery of Munich, and the path has been transformed into a wide road. Learning and memory function in a very similar way: intensively used pathways are expanded, while unimportant routes and dead ends are eliminated.

28 Construction in the Head
Not many Max Planck institutes can claim to have a fitness room – and that for research purposes, no less. But researchers at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig aren’t interested in hardening muscles. They want to use the training equipment to study how training motion sequences changes the brain.

36 The Anatomy of Learning
Our brain is a work in progress. From childhood to old age, it is continually modifying its structure and connectivity to support behavioral flexibility and plasticity (modifiability). Scientists at the Max Planck Institute for Human Development are examining how the brain is rebuilt in the course of development. The brains of children are generally more plastic than those of adults, but recent findings show that structural plasticity is not entirely lost in adulthood.

ON THE COVER: The cosmos of the brain is in a constant state of change. Useless connections are cut and new ones are formed to keep the brain flexible and adapt to the constantly changing requirements. Scientists use sophisticated techniques to visualize the brain’s circuit diagrams. Diffusion tensor imaging, for instance, shows the complex patterns of nerve fibers.

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