HOW BRAINS LEARN TO RUN

by Katharina Braun (p. 3)

Juvenile, emotionally modulated learning events, such as the formation of an emotional bond between a newborn animal and its mother, are fundamental for the establishment and maintenance of synaptic networks in the developing brain. Our aim is to investigate the cellular and molecular mechanisms underlying experience-driven brain maturation, using two different experimental models, filial imprinting in the domestic chick and early stress and emotional deprivation in the rodent Octodon degus. We discovered that juvenile emotional experiences can induce lasting changes in the limbic system. Early experience and juvenile learning events dramatically alter the synaptic connectivity and complexity within the neuronal networks which are essential for emotional regulation as well as for learning and memory formation. Future interdisciplinary studies will clarify if, and in which way, our knowledge obtained from such animal models can on one hand be applied to educational strategies and on the other hand may aid to improve our understanding of the development of learning deficits, of abnormal emotional behaviors and of the aetiology of mental disorders.

GAMES THAT PARASITES PLAY WITH US

LESSONS FROM TOXOPLASMOSIS

by Dirk Schlüter (p. 21)

It is commonly thought that parasites are harmless pathogens, which can infect humans, but do not cause severe disease. *Toxoplasma (T.) gondii* is considered one of these parasites, which can persist asymptomatically in the brain of its host throughout life. However, this co-existence is not always harmless: an in utero infection of fetuses might result in severe malformations and even abortion (appr. 2000 cases/year in Germany) due to an immature immune system. In addition, HIV patients are at risk to develop a severe, if untreated lethal Toxoplasma encephalitis. Moreover, the unrealistic assumption of a friendly co-existence between humans and parasites is impressively illustrated with respect to the millions of death per year caused by Plasmodia parasites, the causative agent of malaria. Since toxoplasms are not only of medical importance, but also possess some unique biological features the following review summarizes various clinical, cell biological and immunological aspects of toxoplasmosis (including own research data), as a paradigm of a chronic persisting parasitic disease.

MULTIMEDIA AND SECURITY ECRYPT – EUROPEAN NETWORK OF EXCELLENCE IN CRYPTOLOGY

by Jana Dittmann (p. 13)

ECRYPT is a Network of Excellence in the area of cryptology and watermarking with a duration of 48 months. Cryptology is the science that studies mathematical techniques in order to provide secrecy, authenticity and related properties for digital information. Watermarking allows embedding hidden information into the digital media, such that the watermark is imperceptible and difficult to remove. Cryptology and watermarking are interdisciplinary research areas with a high strategic impact for European industry and for the society as a whole. They are a fundamental enabler for security, privacy and dependability in the Information Society for digital asset management. The ECRYPT research roadmap is motivated by the changing environment (evolving towards ambient intelligence) and threat models in which cryptology is deployed, by the gradual erosion of the computational difficulty of the mathematical problems on which cryptology is based, by the need of strong foundations in the watermarking area and by the requirements of new applications and cryptographic implementations. The main objective of ECRYPT is to ensure a durable integration of European research in both academia and industry and to maintain and strengthen the European excellence in these areas. In order to reach this goal, 32 leading players propose to integrate their research capabilities within five virtual labs focused on the following core research areas: symmetric key algorithms, public key algorithms, protocols, implementation, watermarking. Essential integration activities will include joint workshops, exchange of researchers and students, development of common tools and benchmarks and a website and forum which will be a focal point for the network and the wider cryptographic community. Spreading activities will include a training program, a substantial contribution towards standardization, bodies and an active publication policy. The project team has the critical mass and breadth to address the key questions in these areas.

LOGISTICS
TEACHING AND RESEARCH IN MAGDEBURG

by Karl Inderfurth, Michael Schenk, Gerhard Wäscher, Dietrich Ziems (p. 29)

The term Logistics has been around for a long time, and in Magdeburg at the Otto-von-Guericke University it is well represented with Chairs both in the Faculty for Mechanical Engineering since 1992 and also in the Faculty of Economics and Management since 1994. Business as well as Technical Logistics are taught and also researched combining these two different but complementary views.
Logistics is essential in order to supply (and ultimately dispose of) materials to the economy. Increasing globalization has led to the fact that production now occurs in more locations than it did in the past, necessitating the trade (and with it transportation) of goods over larger distances, often with tight scheduling concerns. To meet these challenges requires a firm grasp of both the theory as well as practical issues, such as the analysis of complex networks and their underlying dependences. Information and communication technology has led to innovation which has made it easier to coordinate the flow of goods, information, and money, allowing firms to better plan the efficient use of their infrastructure and resources. The study program in Industrial Engineering specializing in Logistics is specifically designed to provide students with the requisite competence and abilities to master the cross-functional demands of logistics. Meanwhile, research concentrates on the use of mathematical and experimental models, enabling the firm to better manage the increasing complexity in logistics systems from a technical, organizational, and economic point of view.

INTERDISCIPLINARY GENDER-STUDIES
NOT A SEPARATE SUBJECT BUT A PERSPECTIVE OF SCIENCE

by Eva Labouvie (p. 39)

Interdisciplinary Gender-Studies have their origin in theories and methods of Women's-Studies. Today they incorporate women's, men's and gender studies (relationships between the two genders/sexes). Taking new paradigms concerning the scientific process of perception as their point of departure, geder-studies aim at rooting „gender" („gender": cultural sex/aquired by social learning and „sex": biological sex) as a basic social, political and cultural category in all branches of science. According to this perspective „gender" – as a sociocultural category – forms a basic principle for ordering societies. It forms gender-specific realities of life („doing gender": behaviour, qualities, activities, possibilities of conduct and action for men and women).
The analytical category „gender" imparts insights into the different roles attributed to men and women and shows that these are formed by history and culture. It is also able to explain how, where and why these form an integral part of social relationships and symbols, economical and scientific processes and cultural imaginations and reproduce themselves. Judith Butler introduced the idea that not only „gender" but also „sex" is constructed by culture. According to her „sex" forms a cultural construction which was invented by the natural sciences of the 19. century. Her approach led to a redefinition of fundamental assumptions. The dichotomical character of „male" and „female" was put into question and given up. „Sex" appeared now as something which could be reversed, transported and transgressed. Thus one important task of Gender-Studies consists in detecting social constructions of „sex" and „gender" where they have become invisible and seemingly „natural".

MOLECULAR NETWORKS
CHALLENGE FOR BIOLOGY AND PHARMACEUTICAL RESEARCH

by Walter Schubert (p. 47)

After having deciphered the human genome deciphering the molecular networks of the cell, encompassing the myriads of cell functionalities is the next big challenge in human biotechnology. The precise knowledge of this entire functional plan, called the Toponome, is the prerequisite to understand the cellular functions of proteins as elements of spatially determined molecular networks. Basic technologies working on the single cell level have been developed in Magdeburg. Recent success in predicting disease specific protein functions on the basis of partial toponome analyses are the rationale for the development of new drugs.

A LIBRARY AS AN ORGANISM

THE COLLECTION OF BOOKS FORMED BY WALTHER KILLY AND THE UTE AND WOLFRAM NEUMANN FOUNDATION IN THE LIBRARY OF THE UNIVERSITY OF MAGDEBURG

by Wolfgang Adam (p. 55)

According to a statement by Umberto Eco, a library is more than a collection of books, respecting its history and different stocks it has its own organism. The library of the University of Magdeburg owns the collection of books formed by Walther Killy (1917-1995), a famous scholar of history of German literature. The collection – acquired by a second-hand bookseller – is one of the most important German academic libraries. Remarkable are the very precious presentation copies from Peter Szondi and Paul Celan.
The library of the University of Magdeburg has another noteworthy highlight with more than 230 series of books of the Ute and Wolfram Neumann Foundation. With the help of about 10 000 titles (among them the Insel-Bücher and the Schocken-Bücher) it is possible to outline a colourful panorama of the German cultural history in the 20th century.

CHRISTIAN OFFICERS AT THE RESISTANCE
THE EXAMPLE OF HENNING VON TRESCKOW

by Günter Brakelmann (p. 66)

The career of Henning von Tresckow, a protestantic prussian officer, can be seen as an example for many other men of same profession and rank. They fulfilled their duty in the German Reichswehr as patriots, but without any obligation to the Weimarer Republik. They agreed to Hitler's assumption of power, hoped for a new role of the armed forces in the new authoritarian system of „national revolution" and supported Hitler's policy of revisory and the rearmament of Germany as a presupposition for a new foreign policy of this nation.
As well Tresckow was glad about the new constellation on the „day of Potsdam". But after the „Röhm-Putsch" in 1934 had taken place, his characteristical belief in law failed. The oath „unconditional obedience" to Hitler as well as the deposition of Blomberg and Fritsch in 1938 made him take the first step from distance to the readiness for active resistance. At the latest Hitler's policy of war in 1938/39 made him recognize, that Hitler would lead Germany inscrutably. The experiences during the war against Poland and later against Russia which was a war of conquest and extermination took him on the side of the military resistance. He became the head of conspirators at the eastern front and soon he got in contact with Stauffenberg. Together with him he became the most consequent opponent against Hitler and his policy. He urged to make an attempt on Hitler's life as a condition to stop the war and to end the System of Nacional Socialism. The process of this development and its single phases helps to understand, how he and the others define their decision to make an attempt on Hitler's life as a result of christian conscience. Even though he was entangled in guiltiness because of leading the armed forces in the east, it has become his duty in morality and policy to murder the tyrant, to stop the bloody war and to start a new beginning of the German policy.