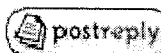
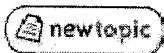


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The role of glia in dreams and delusions



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Bernhard Mitterauer

Posted: Wed Jun 21, 2006 8:58 am Post
subject: The role of glia in dreams and delusions



Joined: 07 Jun 2005
Posts: 10

Do glia play a comparable role in dream states and schizophrenic delusions?

Bernhard Mitterauer

One of my schizophrenic patients spontaneously told me: "schizophrenia is dreaming, that's all". Here, I will shortly attempt a "gliocentric" explanation that this patient could be right.

Despite progress in biological sleep or dream research, up to now it is based on an exclusively neuronal approach (Hobson, 2005). However, the current hypotheses on glial-neuronal interactions (Robertson, 2002; Mitterauer, 2006; Mitterauer and Kopp, 2003) could be explanatory what the alteration of consciousness in dreams concerns.

Let me focus on strange dream contents and scenarios. Strange dreams are defined as dream contents that are unfeasible in awake conscious states. These are often compared to the main schizophrenic symptoms of delusions and hallucinations. I hypothesize that the same mechanism may be at work in the generation of both strange dreams and schizophrenic delusions.

It is experimentally verified that in tripartite synapses astrocytes produce transmitters that occupy receptors on the presynapse temporarily interrupting synaptic information transmission in the sense of a negative feedback. In other words: astrocytes have a temporal boundary-setting function (Mitterauer, 1998). This elementary mechanism may exert an information structuring function determining the compartmental organization of neuronal networks.

In schizophrenia, this astrocytic information structuring function may be lost, since astrocytes do not produce transmitters or express non-functional receptors because of pertinent mutations. The effect is an unconstrained information flux in synapses leading to compartmentless neuronal networks in the sense of a generalization of neuronal information processing. I call this "loss of self-boundaries in schizophrenia" (Mitterauer, 2003). Therefore, a patient with schizophrenia is incapable of testing the reality of his (her) delusional ideas.

Usually, the contents of strange dreams are comparable to delusions. An example is the dream of being able to fly. One of my patients is not merely dreaming that, but he is rather convinced of actually flying from Austria to India within minutes. The phenomenological difference is that the dreaming person upon awakening is fully able to test the reality. In contrast, the schizophrenic patient is not.

Supposing that our intentional programs are permanently generated in the glial syncytia (Mitterauer, 2006), then their realization in the neuronal networks via perception and motion is decisive. In dreams we have the chance to play our intentions in various scenarios independent of their feasibility, since the perception systems are turned off.

Now, it is typical for strange-dream scenarios that objects or individuals of the environmental realities confuse and design uncanny figures and pictures in the sense of a loss of boundaries. The same glial mechanism could be responsible as in schizophrenic delusions. However, whereas schizophrenia represents a chronic pathological process (mutations), dream states occur as a circadian physiological behavior that gives us the chance of acting out our hidden intentions

without the pressure of their feasibility.

Based on these considerations the elementary function of glia in dream states could be described as follows: astrocytes temporarily (according to the hypothalamic circadian rhythms) turn off their interactions with the neuronal system in tripartite synapses. This mechanism is comparable to that proposed for schizophrenia. In addition, the generation of intentional programs in the glial syncytia not only continues, but even dominates the consciousness as dream states.

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