INTERHEMISPHERIC TRANSFER IN A MARSUPIAL

A behavioural investigation of interhemispheric transfer of visual information in Trichosurus vulpecula.

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Donald MacD. Webster

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ABSTRACT

Eight marsupial phalangers, (Trichosurus vulpecula) with mid-saggital section of the optic chiasma were trained monocularly in a visual discrimination task, as were four which had, in addition, mid-saggital sections of the anterior commissure, fasciculus aberrans and hippocampal commissure. All were tested for transfer to the untrained hemisphere. The results showed that those with the commissures intact transferred information to the hemisphere not trained directly, while those with commissures sectioned did not. It appears that transfer of visual information between cerebral hemispheres can take place in an animal which lacks a corpus callosum, and that the forebrain commissures may be the functional equivalent, in this marsupial, of the corpus callosum in eutherians.

A further eight animals received mid-saggital section of the optic chiasma. Two had all other interhemispheric pathways intact, two had mid-saggital section of fasciculus aberrans and hippocampal and anterior commissures, two had fasciculus aberrans only sectioned, and two had fasciculus aberrans only intact. All were trained monocularly in a visual discrimination task and tested for transfer to the opposite hemisphere. Those with all commissural pathways intact and those with only fasciculus aberrans intact demonstrated transfer. Those with all commissures sectioned and those with only fasciculus aberrans sectioned did not show

transfer. It seems probable that integrity of fasciculus aberrans is a necessary and sufficient commissural condition for interhemispheric transfer of visual information in this marsupial.