Secrets of the Mind ~ V.S. Ramachandran

In this talk, the author gives amazing insights into the neuroscience of the brain functioning with several brain disorders. Firstly he mentions Phantom Limb syndrome- a person having a certain organ amputated still feels its presence. Also, when the person was touched on the face, he felt that his phantom limb is being touched. A possible explanation is the somatosensory cortex(responsible for touch) has the touch activations area of face and hand next to each other. So, if the left limb is amputated, activations in the face area of the right somatosensory cortex will start invading the hand area next to it and slowly conquer it either through sprouting new neural connections to it or making dormant connections active. Phantom may occur with any part of the body- phantom menstrual cramps after hysterectomy, phantom appendix pain, etc. Pain in phantom limb was treatable through mirror box. Next, he discusses blindsight- our vision is a two-way pathway, one pathway goes from the eyes to the visual cortex, generates senses consciously helping us to recognize an object, color, shape, etc. Another pathway goes from the eyes to the parietal lobe generates signals unconsciously helping us in navigation, the direction of moving objects, etc. Reptiles very much depend on the later pathway for their survival, since they need to capture their prey's motion very fast, i.e., unconsciously. Visual Neglect is another disorder in which a person completely ignores one side of their visual field caused by damage to any of the contralateral parietal lobes. The person will although get the sensory inputs for that side which is neglected, the brain won't be aware of it at higher levels, neglecting to associate any meaning from that side. The next interesting phenomenon is "Capgras Delusion". Signals for visions are decoded for recognition in the visual cortex then the temporal lobe, after that they pass through the amygdala to higher centers where emotions are being associated. This pathway from the amygdala to emotion centers is destroyed in this syndrome. Hence a person may identify that his father looks like his father but due to being unable to associate emotions feels like the father is an imposter. The same thing can happen with mothers, pets as well. Since only the visual pathway is destroyed the person may recognize his father through voice. Lastly, we talk about temporal lobe epilepsy. The seizure occurs whenever there is a storm of neurons firings occur randomly in any part of the brain, in our case, in the temporal lobe. Commonly, people with epilepsy have intense religious feelings despite might not being connected to religion ever. One possible explanation is that the neural wirings in the amygdala and higher emotional centers are stronger for relevant things, and weaker for not, but repeated epileptic seizures strengthen the pathways for all things, hence a person starts having emotional feelings for everything, even the grain of sand, trees, surroundings and starts feeling a divine aura- and due to our cultural perceptions in the evolutionary process, we've always associated such things to god. It's so awe-inspiring that things like religion can now be viewed from the perspective of science.