WEEK 4 INTENTIONALITY
STEP 4.2. ANATOMY AND PHYSIOLOGY OF INTENTIONALITY

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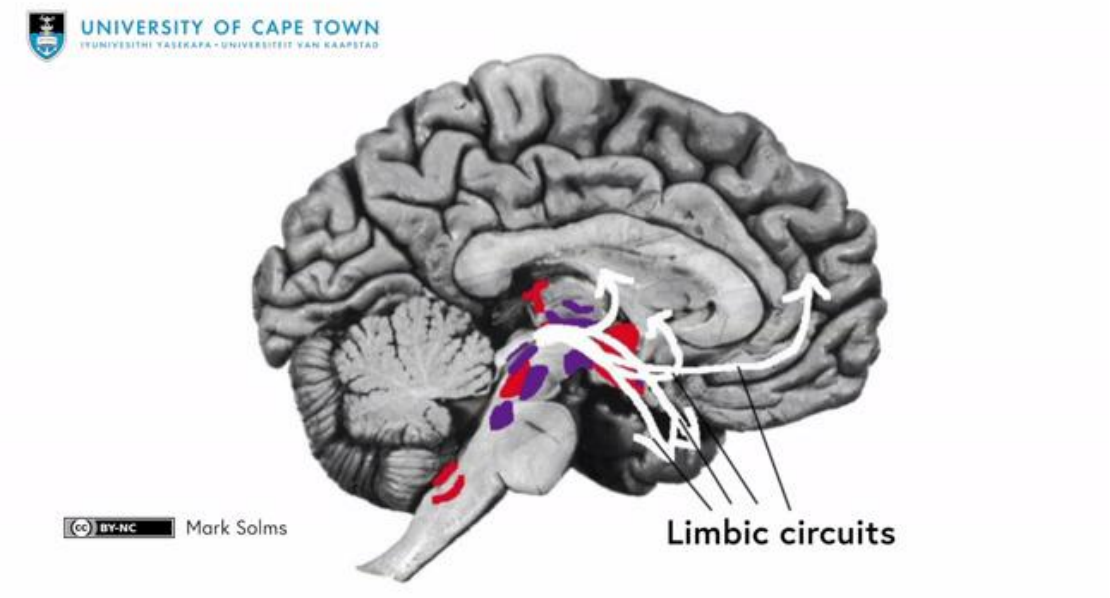
Now I want to be a little bit more specific about aboutness, about intentionality. I want to be more specific about its anatomy and physiology.

The **reticular activating system** in the upper brain stem is what switches on the lights. It's the volume control mechanism for consciousness. But as I've told you before, consciousness feels like something. And this level of the brain, when it generates consciousness, it generates consciousness within a scale of pleasurable or unpleasurable affects or feelings.

Now, built above the level of the upper brain stem and, in fact, connecting the brain stem with the forebrain, with the higher brain, are a number of circuits that we call **limbic circuits**. These are circuits for **instinctual action, for doing something about your feelings in the outside world**.



The foremost among these, the most important among these instinctual action systems or circuits of the limbic system goes by various names. Rawls calls it the rewards

system. Berridge calls it the wanting system. Panksepp calls it the seeking system. It's also been called the curiosity, or interest, or expectancy system.

If you conglomerate all of these names, you get a sense of what the circuit does. Anatomically speaking, it's called the **mesocortical mesolimbic dopamine system**. And the dopamine part of that is the name of the neurotransmitter that this system excretes in the forebrain.

There are all kinds of neurotransmitters. This is the basic chemical by which nerve impulses are transmitted. And the most rudimentary neurotransmitters are either excitatory or inhibitory, like glutamate is excitatory, and GABA is inhibitory.

Then there are more nuanced types of neurotransmitters, younger in evolutionary terms. And the one we're talking about today is **dopamine**. So dopamine is the chemical that does the work of these functions that I was enumerating earlier, seeking, wanting etcetera.

If you want to think-- if I can give you an image of how this system works, think about a dog in an open field. Plunk the dog down. What does it do? Sniffs the air, looks around, starts moving forwards, wagging its tail. And in a kind of an interested, enthusiastic, curious way, it starts to explore its environment.

This is where the word "seeking" comes from in Panksepp's term for this system. It's foraging. In a word, it's foraging.

Whatever the dog needs, its needs are going to be met out there. And this seeking or wanting system motivates the dog to explore. And the reward for that is whatever it needs, it's going to find out there in the world, if it has this enthusiastic, positive expectation that its needs will be met out there.

That's what this system does, foraging system. You can see why it's evolved. It's a terribly important, very basic biological system.

In humans, perhaps the equivalent of foraging is something like cruising, driving around the streets in your Cadillac, checking things out, looking for a good time. Those of you who-- well, in fact, I'm sure none of you have been so naughty as to have snorted cocaine. But you might know people who've done that. And if you look at how people behave when they've snorted cocaine, you'll get a very good idea, again, of what this system does. It sort of activates you, energises you, motivates you in a positive way and makes you feel kind of sexy and enthusiastic.

There's going to be a party tonight. I don't exactly know who's going to be there, but I'm going to be there. I'm going to check out the scene. I think I'm going to have a good time. Something good might happen. That kind of-- well, it's irritating unless it's you who's feeling it.

This is the human equivalent. And cocaine activates this seeking system really exquisitely, better than anything else.

But it's important to point out that this kind of motivated seeking that this system performs doesn't have to be actual concrete action in the outside world. In human beings, much of our seeking, in fact, it consists in little more than eye movements, a visual seeking, interest in the world, trying to make sense of the world, trying to see, how can I meet my needs in the world?

It can even entail, like the eye movements when you sleep, which are accompanied by dreams, it's a sort of virtual action that's going on. Dreams are motivated. Dreams are driven by this very same system, this same dopamine system. So the virtual action, the searching of your memory traces, the searching of your ideas, of the internal representations of your mind, and trying to make meaning out of that, as happens in dreams, this is what this system does.

I really have to emphasise the **meaning making**, because remember, this is an intentional system. The whole thing is, how am I going to solve my problems in the world? That's what this system is for. And so it's making meaning in that very basic biological sense of the word.

If you overactivate this system, as happens, for example, in amphetamine psychosis-- because amphetamines also, like cocaine, they activate this system exquisitely-- you end up making too much meaning. That's what the word psychosis means.

You find links and see meaning of a kind like, wow, man, look at this. Jeez, it all makes sense to me now. This kind of an overfocus, and an overinterest, and an overinterpretation, and an imbuing with too much meaning what one's engaging with in the object world.

What I'm leading up to is that this system, which makes you blindly seek and forage and hope and expect and engage with objects, not only does it randomly bring you into contact with the things that you then find, well, I'll eat that. Ooh, I'll drink this. Mm, I'll copulate with that. This is how the foraging system works.

But in doing that, which is, as I say, a kind of blind process, you're simultaneously learning about your environment. So the next time that dog goes into that open field, it knows behind that tree is one of those things, or in that park, you might find birds. And whoops, cats tend to gather there, and so on.

So think of a kitten. You have a new kitten, and you put it in your apartment. After it's nervously looked around a little bit, it starts to explore. It sniffs around, into this room, behind there, under there.

Here are cats. Here are rats. Here's mice. There's dogs. And so they make meaning of the environment that they find themselves in.

That's the crucial thing, this **intentionality system**, this wanting system, this desire-seeking system, **by making you engage with the world, you learn about the world**. And on that is your store of knowledge. Your learning from experience is built.

What about damage to this system? There was a disease called encephalitis lethargica, which there was a terrible epidemic of this disease shortly after the First World War and it particularly attacked this system, this part of the medial forebrain bundle.

These patients fell into what was called a "sleep." It actually wasn't a sleep. Encephalitis lethargica means "sleeping sickness," but they weren't asleep. They were conscious. But they were doing nothing. They just sat there in this apathetic, inert, aspontaneous, uninterested state.

Until one day, decades later, a drug called levodopa, which artificially increases dopamine in the brain, was discovered or invented. And when levodopa was given to these patients, as in Oliver Sacks' film, Awakenings, so their interest, their curiosity, their expectancy, their desire reemerged. And they re-engaged with the world.

Remarkably, when Oliver Sacks asked those patients of his, what was it like during the last 20 or 30 years while you had no mesocortical mesolimbic dopamine in your brain? What happened? What did it feel like?

They said, for the most part, nothing happened. It's in that sense that intentionality, the thing that this system underpins, is so fundamental to mental life. When those patients say nothing happened, what they're referring to is the subjective state that they were in. Remember, they were conscious, but they were like zombies. They were, in a word, mindless.