The Night Shift

Out Of The Darkness

It is a doppelgänger of our waking life—the universe of our dreams. When we're immersed in them, those dreams can *feel* as real as the world in which you're reading this right now. This is because, in both places, one thing is the same: we sense that we are conscious. And we are—but they are very *different forms* of consciousness. And there are reasons for this, because in our brain, there are reasons for *everything*.

So, why do we dream? In the view of Narrative Complexity, that's an answer that the mechanisms themselves reveal (particularly when viewed alongside the work of dream research pioneers like psychiatrist Allan Hobson [1, 2]). One of the beauties of the brain's elegant systems is that once you've laid out their basic mechanisms, some of the more specific aspects of consciousness—like dreaming—start coming into focus. The sharpest view of our dream world: it's the *night shift* of our consciousness.

What is this night shift's job? During the day shift, our consciousness' primary purpose is to guide our decisions & actions. When we're asleep, of course, we're not *acting* on anything. But determining actions *in the moment* isn't the only purpose of our consciousness. It's also using data derived from daily experiences to help prepare its systems for *future* actions. As it processes this incoming data, our consciousness is simultaneously shaping both how these systems will respond in the future and the scope of those responses—helping establish or reinforce cognitive routines and connections within stored data via application and association of that incoming day-shift data (*topics of Essay#4*).

According to our hypothesis, the night shift (aka, *dream consciousness*) specializes in that last part: *applying* & *associating* data in order to help shape both how these systems will respond in the future and the scope of those responses. But when we're dreaming, there's none of that incoming *real-world* data for our consciousness to process. Therefore, instead of applying & associating incoming (via sensory organs) real-world data, our dream-state seems to primarily process & associate *stored* data (and the *subsequent* data produced by the stream of

dream consciousness that's generated and sustained by that stored data.)

When that first piece of stored data (likely something recent or high priority) slips into the mechanisms of our *internal dialogue loop* during our dream state—REM sleep—the associations & narrative-building that induce dream consciousness begin. Why is our brain engaging in this (highly fluid) generative & associative process while we sleep? We'll be delving into those answers in greater context throughout this essay, but the bottom line: consciousness is a prediction/problem-solving machine, and its mechanisms are more flexible & usefully-applicable if they are conditioned to allow for a broader, more diverse range of possible predictions or solutions. (This kind of purpose is also supported by neuroscientist Eric Hoel's insightful 2021 paper "The overfitted brain: Dreams evolved to assist generalization." [3] Hoel's framing of the matter as an "overfitting" problem spurred me to revisit this essay and make clear here that the *applying*—essentially, the narrative element—is just as beneficial as the *associating* in our dreams.)

Here's Where Things Get Weird

Once that first piece of data has started the loop during dream consciousness, literally anything is possible. From our systematic view, their are likely two main reasons for this wildly-open dream world. One, our narrative loop is using the same associative subconscious mechanic that it always uses when processing data. This means that even though the most recent or currently high-priority data is most-likely to both begin & continue to reappear in our dream narratives, *all data* is up for grabs through that magical network of language, emotion & memory. So if your dream suddenly seemingly veers off track, what's really happened is that your brain has merely made one of those miraculous leaps of association into another buried network of ideas, memories & images.

As we said, there are likely *two* (at least) reasons for this wildly-open dream world. The second reason is at the root of why the first reason (our associative neural network) results in more dream-randomness than awake-randomness. That's because, in our dream state, there's none of that *actual* environmental data to support our narrative loop. Our physical environment is what keeps us literally & figuratively grounded; it's the primary factor in the consistency of our wakeful consciousness.

When we're awake (& not daydreaming) our consciousness is framed by what we perceive & identify to be most important/relevant/useful in our environment. Think of this environmental data as *the setting* of our narrative loop. Most wakefully-conscious narrative events happen in the

context or in relationship to the context of our immediate physical setting. In our dreams, there *is* no incoming data depicting a physical environmental setting. But our narrative loop still requires one. In a way, it more than *requires* one, our narrative loop simply *assumes* there's one (just as it's the fundamental nature of this loop to *assume* there's some kind of *story* to be derived from or found in this setting). And just like so many other elements in our narrative-building process—if our brain can't find the appropriate data to complete the picture, it makes it up.

(Re: that external sensory input, as noted by our chart in the Appendices, *Distinct States of Consciousness & Non-Consciousness*—the only external input system that appears to be almost *entirely* shutdown during R.E.M. & non-conscious sleeping states is our external *visual* input. External olfactory, auditory & tactile input systems are all obviously repressed during sleeping states, but still remain partly-active and are capable of processing & responding to intense external stimuli—which is why data from external stimuli like loud noises, powerful scents, and *sudden unexpected wetness* might find its way into your dream just before it helps to spark you awake.)

So, in the absence of *actual* environmental data, our dreams get their own brain-painted settings (& people, which are really just a unique part of the setting). And the brain doesn't have to go very far to get the necessary data—all the stored data used in dreams has lots of attached visual, auditory, etc. information, which the brain can make use of when building a scene. Usually most of this attached sensory data is either ignored or discarded in the process of creating our waking conscious narrative—overridden by the more *neurally prestigious* actual incoming sensory data. However, not all of this already-stored sensory data is discarded while running our waking narrative loop. Whenever, for example, we have the normal gaps in perception during our observation of the "real" world, but suddenly require that unperceived data to complete a current or retrospective conscious rendering of the moment, we use appropriate pieces of that already-stored sensory data to fill in the gaps.

This is why you might claim—upon almost immediate recollection—that *the man who stole the woman's purse* was wearing a *red cap*. When in fact, your brain ignored the color in the actual moment, using the more generic *baseball cap* visual contours and/or linguistic tag when it perceived & recorded the event. Thus, upon that nearly-instantaneous recollection, a common red cap from your memory is used when you replay the moment in your mind and return to that element in detail. Until you saw the woman's purse being stolen, your brain didn't care what color the man's cap was, and this

data's low priority led your mind to neglect recording it. And after the purse was stolen, in those few seconds it took for the brain to re-prioritize & analyze the details of the man's appearance, he was lost in the crowd. This vague version of the man is simply not good enough for your brain when someone immediately asks you: *What did he look like?* Our brain knows that in situations like this the questioner—and thus *we*—want a better answer than *A guy in a jacket and cap*. And, as explained earlier, our brain doesn't need to try very hard to give these demanding audiences a better answer. To make matters even more dodgy, once the brain gives this "enhanced" answer, it has a tendency—because of the mechanisms of memory—to make a quick believer of even *itself*. If you think this means that we typically trust our memory far too much, well—I don't think I could argue with that. (We'll discuss these kinds of memory mechanics in much greater detail in our next essay.)

And Let The Weirdness Be Unfettered

Getting back to our *night shift*...when we're dreaming, this "fill-in-the-blank" mode of setting & entity construction becomes the sole engine for the creation of our perceived environment. And because there's no actual environmental data to override this mode, our dreams are wildly fluid in their settings & contents. As soon as the narrative loop makes a big leap to another neural network, the dream's elements (including *people's identities*) can be morphed by whatever data is most closely related to the newly-pinged network.

And when we're in this dream mode, our brain doesn't seem terribly concerned with making believable situations out of this random data and typically doesn't even attempt to make sensible narrative transitions between the events & settings. Although our dreams often seem to employ their own habitual & vague (i.e., incredibly *lazy)* "solutions" to these nonsensical leaps. For example, many of my own dreams take place in massive-but-ambiguous "hotels" or "complexes" or "campuses" within which all of the variously incongruent circumstances/settings are seemingly, fuzzily & nonsensically contained.

This *unfettered weirdness* or unbelievability in our dream scenarios is likely because of another apparent quirk of our dream-state consciousness: the normal path of our narrative loop seems slightly altered, entirely skipping (or not "awakening") those *validity* mechanisms in our brain. (Mechanisms governing judgements about likelihood & plausibility, and producing emotions like anxiety & doubt—as discussed in the previous essay.)

This altered loop actually makes sense when we look more deeply into those real purposes

of our dreams. As we mentioned, when we're awake, our consciousness' primary purpose is to make quick, reliable decisions, then move on to the next one. This means that there's lots of possibly valuable information that might not get an extended pass through our associative processes as we plow through the day. It also means—during those often *redundant* days—that incoming data is repeatedly running through similar grooves in your cognitive routine.[4] Both of these issues can ultimately contribute to the same result: narrowing the scope of possible future predictions & solutions generated when applying & associating incoming data.

At some point in our evolution (or, more likely, in the evolution of a few stages of mammals before us) the algorithms of time & DNA discovered that—since this consciousness system wasn't doing anything while we slept, and because we could run it without expending the energy to create (and risk) actual resulting actions—this big window of non-wakefulness was a great time to conduct that diverse, broadly-based *applying* & *associating* of stored data. And so, the brain put *the night shift* to work.

This night shift's main job is to generate as many unlikely-but-possibly-useful applications of & associations with recent or high priority data (and the random data that flows from it). The result is that when you wake up, there are new (or stronger existing) associative pathways & broader (or *less-rutted*) cognitive branches (aka, *rule sets*—discussed at length next essay) thanks to those dream-processed associations & applications.

Thus, because dreams are essentially meant to help us broaden the scope of possibly-useful data applications & associations, inhibiting or switching off our validity mechanisms aids this by unleashing an uninhibited range of narrative possibilities and an unlikely parade of data associations—which are especially fluid in the absence of a real-world physical environment. When we're conscious, our validity mechanisms help us to reject & limit (or *be very nervous about trusting*) narratives that don't seem plausible, because they're not typically useful when making decisions. If we did this in our dreams, the inconsistencies & hyper-fluidity in plot & setting that are inherent to dreams (and useful for broad-ranging data application & association) might lead to a near-constant "rejection" of our dream narratives.

In essence, our narrative loop would create the kind of "insanity" apparent in individuals like schizophrenics, whose neurological disfunction produces myriad narrative inconsistencies—resulting in an insanity rooted in the anxiety created by an ongoing negative-validity judgement of the world around them. When we shut down or avoid

our validity station while dreaming, we are free to generate & experience an illogical, invalid, but fluidly-associative world without the anxiety that our brain is trained to produce in the face of such a world.

Although it *seems* like our dreams are often *filled* with anxiety—in the view of Narrative Complexity's emotions hypothesis, the emotion we are actually feeling is *fear.* And this emotion (as discussed in the previous essay) is very closely-related to anxiety, but fear judges only the potential value loss, *not* the *validity* of that value-loss prediction. Thus, our truant validity in our dreams likely intensifies the fear & excitement—because our dream-view of those potential gains & losses is unmitigated by any judgement of their likelihood. When it seems like we're constantly *totally stressed* in our dreams, it's because every potential loss we imagine in our unawake narratives feels, essentially, inevitable. (And that gauzy *bliss* we feel in our happiest dreams is likely a result of perceiving their glorious gains as, essentially, certain & perpetual.)

If you're looking for *more* evidence that those validity judgements have gone AWOL during our dreams, consider one of the primary & most-recognizable of our validity-based emotional responses—the response to a highly unlikely (or unpredicted) result: *surprise*. In our dreams, *nothing* seems to surprise us. A talking, human-sized elephant wearing your mother's raincoat and begging you not to eat the birthday cake? *Sure, we'll buy that.* Sights & scenarios that would set-off full-shock validity alarms during the day are totally *unsurprising* during the night shift.

Then Let The Weirdness Be Forgotten

Another one of the other likely side-effects of these absent validity mechanisms: our dreams tend to be awfully slippery critters in terms of memory. When we record a waking memory, the validity of the narrative is a key player in how this data is remembered. The less valid the data, the less likely it is to get the call back when related data enters the system later. Therefore, an awful lot of our dream-produced narratives are basically labeled with the *don't bother* tag in our memory, if they were recorded at all.

Which is okay for our brains, because even if the actual narrative has been kept from full recall, the new associations & cognitive impacts—no matter how faint—still remain. And those results are all the brain was looking for, to add some new possible pathways for our next waking attempt to generate a useful or unique prediction or solution. Plus, y'know, it *didn't* actually happen; it's *not* valid data and *doesn't* provide real evidence about the world —so we're much better off *not* remembering it as real. This is probably another reason why evolution found it useful to shut down these validity systems while dreaming: if they were

active, a dream that accidentally seems very real and passes the validity test might ultimately (& incorrectly) be judged later as an actual event. However, this absence of a validity tag doesn't mean that *none* of the dream narratives are well-remembered. The value judgement & tagging systems that are still up-and-running in our dreams are another key player in how strongly a memory is imprinted, so dreams that involve high value events (which create strong in-dream emotions, e.g. nightmares) can still result in narratives that can be easily recalled & replayed in our minds when awake.

This in-dream combination of "online" *value-based* emotional/memory systems & "offline" *validity-based* emotional/memory systems is likely why we can *remember* some dreams & yet still intuitively *distinguish* those dreams from some other *real* memory —because those dream memories lack that neural validity, which allows us to consciously "perceive" their *falseness*. Of course, if you start remembering a particularly-believable dream while awake, and begin too-closely associating it with some *actual* memories while those validity systems are now "online"—it can become possible over time (& the course of a very hectic life) to start accidentally tagging an old dream narrative with the tiniest bit of *wrongly-placed* neural validity. And once this dream has its toe in the door of *truth*, it can be a slippery slope to becoming a kind of *truly remembered* reality.

Returning to those more *useful* powers of our dreams—due to another key player in our memory (*repeated recall*, whose effects will be discussed at length in the next essay) *any* processing or pinging of that recently-consumed (*real-life*) data during our dreams likely aids in that data being more well-remembered and easier to recall. Which might explain why it's been shown that studying immediately before sleeping aids in remembering & applying that specific material later. By studying the material immediately before sleeping, you're helping to ensure that this very-recent data will be used during the night shift, and thus, be easier to recall and use the next day.

About Those Wondrous Walnuts...

When we talk about these individual mechanisms of consciousness (like validity) being regulated—in essence, the regulation of those systems that both *determine whether we are awake or asleep*, and *how our consciousness-producing internal dialogue loop functions (or ceases)* in those different states —we are actually talking about two little walnuts tucked deep in our brain: our thalamus. This symmetrical pair of nuggets that rests atop our cerebellum is connected to myriad parts of our brain—serving as a destination, way station & departure point for the multiple interweaving loops of data,

experience & response that turn the gears of our consciousness.

Generally speaking, all chordates (the lineage that has led to spinal columns—from invertebrates like sea quirts and hagfish to vertebrates like sharks and everything after) employ 6 primary systems to manage nerve-based "data & response" behavior. An external data input system (external senses), an internal data collection system (internal gauges of temperature, etc.), external & internal data analysis systems (to determine responses), a motor control system (to enact responses), and a *switchboard* (to help manage responses). In vertebrates, the thalamus & basal ganglia essentially serve as the brain's two primary switchboards—receiving data from their network of connections and using neural circuitry & neurotransmitters to help inhibit & enact a vast variety of scripted responses in other parts of the brain, and ultimately in nerves & muscle fibers throughout the entire body.

The more evolved the brain, the more complex the role of these switchboards in handling all of the neural traffic that generates the seemingly uncountable aspects of behavior & cognition. This means that in the ultra-evolved brains of humans, the thalamus has a long, broad list of responsibilities. For example, all of our sensory systems (except the olfactory, which is handled by the basal ganglia) route their data through the thalamus in its journey through the loop.

The biggest switch controlled by our thalamus is one that relates directly to dreaming: the *conscious/unconscious switch*. Without a functioning thalamus, consciousness cannot be achieved (i.e., damage to the thalamus can result in coma).[5] Because it's believed that the thalamus switches our brain from waking mode to sleeping mode, it's likely that the thalamus is also the key that starts-up our dream-state consciousness. Research has, indeed, shown that during dreams parts of the thalamus are active, and its connections to portions of the cortex and the visual system are also engaged (& interacting in uniquely *associative* ways).[6] In this dream-state, it is therefore also likely that our thalamic "switchboard" is what helps to regulate that altered loop of consciousness—e.g., switching off (or not awakening) those validity mechanisms used in the building & analyzing of narratives.

Evolutionarily, it makes sense that between our brain's two primary switchboards—the thalamus & basal ganglia—the former came to control our modes of consciousness. Although both first appear in ancient vertebrates like sharks, and the two organs communicate reciprocally (inhibiting & enacting across their wires both competing & cooperating motor scripts originally

generated via all their data input sources) the thalamus & basal ganglia, as noted, controlled distinctly different sensory switchboards: visual & olfactory, respectively.

As brains evolved, more advanced animals began to rely much more heavily (& complexly) on vision & the other senses managed by the thalamus. This ultimately lead those early cerebral cortexes (heavily-founded upon expanded, complex optical lobes) to become the engine of cognition in mammals. Thus positioning our visually-rooted switchboard to take over as the manager of the most important evolved feature of those magnificent vertebrate brains—the feature that developed a clever on/off & *on-but-only-dreaming* switch: consciousness.

Why The Weirdness Is Drawn in Crayon

As mentioned, science has suggested that our consciousness (via our thalamus) makes use of our visual systems while we're dreaming. And although we usually spend our time in these essays worshipping & praising the brain's ability to create beauty, there's something slightly unkind that needs to be noted about our consciousness's use of those visual systems, about its skill as a solo "set-painter." It's something that becomes fairly clear in our dreams: left alone, our consciousness is, frankly, *a hack*.

Our brain's real virtuoso creator of settings —its union-sanctioned cinematographer— is our *eyes*. But that part of our system is entirely dependent on actual incoming environmental data. Our memory-stored visual data simply isn't as rich & detailed as the real stuff consumed via those ocular organs. Thanks to our data limitations, in its memory-stored form, we only get the *general contours* of that original incoming visual data when using it for association, comparison & recall. (Another matter we'll explore in detail in our next essay.)

Therefore, when we're building the settings of our dream worlds, the *general contours* of our environment are all we get. You might think of this dream environment as a *low resolution* version of the real world. That incredible detail in a waking moment requires vast piles of visual data, resulting in a highly-detailed moment-to-moment rendering. With less rich visual data to build from, our dreams can only achieve a medium or low detail setting. Which means that dreams can still contain vivid, colorful, and powerful images—but ultimately, each individual dream scene or moment is limited in the quantity & quality of what it is depicting. And this leads to these scenes usually containing a handful of dominant & powerful elements, but a kind of *fuzziness* around the edges or in the more fine-grained detail of the situation.

What The Weirdness Tells Us

Of course, whenever we talk about dreams, the real question in the back of everyone's minds is the same, and it has nothing to do with image resolution: *What do my dreams mean?* The answer: that depends. Frankly, they don't usually *mean* much at all. In other words, they aren't *intended* to tell us things that we somehow can't express to ourselves consciously—our dreams don't have a *strategy* for what they're telling us other than essentially random association to current high priority data & the narratives that flow from it.

Nonetheless, we might still *learn* things and *infer* useful information from our dreams both consciously & subconsciously. The primary "truths" that our dreams might tell us are which recently experienced events or contemplated ideas have been perceived as fairly important during the course of the day, and thus have influenced our dream narratives, which are more likely to use that recent higher-priority data during the process. Or they might foster & reveal connections between ideas or events that are sneakily-related but were not previously linked by your day shift consciousness.

And through those new narratively-created applications & associations of stored data, our dreams are capable of opening possible pathways to otherwise unlikely-to-be-generated ideas or actions—which is really their main purpose.

Why, Exactly, Must We Watch All This Night Shift Weirdness?

So then, our last question about dreams echoes that central question we asked about our internal dialogue loop: why do we actually *experience* dreams? In other words, when our sleeping brain is running its little super-fluid data application & association night shift sub-program, why does it bother to tell our consciousness this silly story to go along with the sub-program? *It can't help itself*. It's the only way our consciousness works. Our brain can still run the narrative loop without external input, and that loop can skip a side-station like validity (which recent science is suggesting happens in a very specific region of the brain). But that narrative-building, thought-generating, inside-your-head experience is a *necessary part* of our consciousness' looping generative & associative process.

Once we've closed off our external input data pipes, that narratively-built internal dialogue & accompanying experience are the only possible sources of incoming data for our subconscious to process. As discussed throughout these essays—in our looping model, this sustained flow of incoming data is what *drives* those associative processes within our stored data. We are conscious in our dreams because we *need* to be in order to run the night shift's sub-program. As with every product of consciousness—our dreams

must result from its narrative-loop internal-dialogue-based system, because it's the system that's required to access & apply *any* of our memory-stored experiential data. More specifically, our internal dialogue is the system that's required to access & apply that data *linguistically & syntactically*—which (as we'll discuss in our next essay) is how that experiential data is primarily *stored*, and thus the best way for us to broadly apply & associate that data.

Think of it this way: many pre-language mammals also probably experience dreams and use those dreams to generate random (& possibility-broadening) applications for & associations within their rudimentarily narrative, but purely sensory-based, experiential stored data. However, unlike humans' *wacky-yet-still-narratively-driven-&-complex* dream state, it seems likely that (by applying those rudimentary narrative structures to purely-sensory stored data) pre-language mammalian dreams sequences are less elaborately plotted & more narrowly focused in their scenes (yet still similarly weird & randomly-connected). *Chasing a cat around a circular, dirt-filled swimming pool, trying to eat kibble from a giant, wobbling bowl, pawing at a donut rolling along an endless park bench.* In other words, if we *didn't* power our own night shift via our consciousness-generating internal dialogue, and merely used purely-sensory data—our dreams would have about the same limits as *doggy dreams*.

In the end, every aspect of our consciousness is generated by these nested systems. Repress external sensory input & physical action responses, close the off-ramp to our validity station, spark up a recent (or high priority) piece of data in the cue, and *voila!* Those nested systems of consciousness now produce the night shift: the universe of our dreams. Ultimately, this *sub-waking* universe's purpose is, at its core, the same as the purpose of our internal dialogue loop in the waking universe: *to make us better, more adaptable problem-solvers*. To enhance the neural pathways that fuel the human brain's majestic ability to achieve unique & creative solutions to our most vexing challenges.

In the most romantic terms, our dreams—in the most romantically unbound & mercurial of ways—help show us what is *possible*. These doppelgängers of our mind's darkness are engaged in the tireless, shameless task of exploring the strangest & most unlikely paths through our consciousness, seeking in those folds of gray what previously-unexplored or least-traveled trails might lead us to the next beautiful idea that humankind has yet to have seen.

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Endnotes:

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