

The Conscious Stream

Denise Ingebo-Barth

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Acknowledgment

I am grateful to those who have dedicated some part of their lives, or even life itself, that we may live in freedom, and pursue health and happiness.

Denise Ingebo-Barth

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*Forward
to the
Review Edition*

Who would be interested in this model, this edition?

Readers most likely to be interested in this book are those who like to explore ideas about the physical character of consciousness. Students of neuroscience may be especially interested in evaluating a model that postulates how activity in the nervous system translates into personal experience.

Other potential readers are those of us who were looking for self-knowledge when we signed up for a psychology or a physiological psychology class. Others who may be interested are readers who believe that ideas about how emotions arise in the conscious stream are important keys to developing emotional balance. In other words, the model may be a valuable reference point for anyone who enjoys examining clues to emotional fitness.

But can the average person relate to this model? As it's described here, the process that forms the conscious stream is essentially simple, and can be explained using visuals and common terms. Think of the explanation as parallel to descriptions that show how muscles work or how the lungs exchange oxygen for carbon dioxide.

A suggested way to use this book:

As Albert Einstein said in 1938, “Most of the fundamental ideas of science are essentially simple, and may, as a rule, be expressed in a language comprehensible to anyone.”

My goal has been to describe this model in a clear and useful way. If it’s a good, accurate, moment-to-moment explanation of how the conscious stream works, a reader may be able to begin relating visual counterparts of the model to his or her own experience. After each major link of the theory is presented, an area is provided for *Notes* so that reading and relating to the model may be more interactive.

If these ideas are being reviewed with others, the model can be used, for example, to compare how certain feelings evolve, discuss how thoughts come to mind, and identify the role of sensation in generating experiences.

Summary

THE CONSCIOUS STREAM describes a theory built on the idea that consciousness—a stream of separate conscious instants, like frames making up a reel of film—is formed as trajectories circulate around the nervous system circuitry.

In this model, a trajectory is a series of neuron groups energized in turn. (Picture it as a sequence of lights flashing around a marquee or perhaps as a comet blazing through a linked series of packed neuron groups—through circuits of the nervous system.)

When a trajectory passes through the thalamus—a central area of the brain—an instant of experience is inserted into our lifelong conscious stream. This instant of consciousness can be a *sensation*, *thought*, or *feeling*. The particular instant depends on the source of the trajectory. When a trajectory is initiated by sound waves to the ear, and passes through the thalamus, for example, a *sensation* (in this case, a *sound*) enters the conscious stream.

As the description of this model progresses, we see how a trajectory from the thalamus to the cortex is recorded, and becomes a part of a network of records . . . and how, when concurrent trajectories in the cortical network converge and generate a trajectory back to the thalamus, a *thought* enters the conscious stream.

In addition, as trajectories evolve—being repeated, prolonged, released or compounded—emotional *feelings* enter the conscious stream. Over time, patterns of invigoration and relaxation, stagnation and relief are generated, forming our life’s emotional quality.

Finally, the model shows how links of activity form a cycle . . . and how a pattern of cycles forms an “activity.” Patterns of activities, in turn, form a lifestyle. In this model, then, the character of *circulation* in the nervous system reflects emotional fitness.

Although designed primarily for students of neuroscience, this proposed model may also be evaluated by those having an interest in the physical processes underlying emotional fitness.

Part 1

*Looking for the Physical Character
of Consciousness*

Introduction

Looking at Consciousness: a New Technique

Another new way of looking at consciousness

Following recent advances in research, there's been a jump in the public's awareness of the underlying processes that make the body function well.

Through the lessons contained in hundreds of books and videos, we've come to realize how necessary this insight is in initiating and maintaining physical fitness. For example, by knowing what we need for nutrition and exercise, we can craft a balanced diet and exercise program that supports health, endurance and strength. And we have learned, in many cases, what to avoid to maintain health and repair physical problems that we once had to live with.

Now it's time to consider the importance of having an understanding of the processes at work that support emotional fitness.

To start, we have to know where the feelings we associate with emotions come from, because when we have an understanding of the processes that underlie emotional conditions and experiences, we have a base from which to develop emotional fitness. Just as, we have to have an understanding of the processes that underlie physical functions and conditions, to develop physical fitness.

Exactly what processes are we talking about? What happens to cause us to experience feelings, which are a significant part of our overall conscious experience?

To this end, this book presents a set of stand-alone theories that dovetail together to form a single model, a single model that shows how the nervous system forms the conscious stream.

With this understanding of the physical character of consciousness, I believe we can extrapolate the terms of emotional fitness. It's like knowing we need carbohydrates before a sustained exercise like running five kilometers. That knowledge alters what we eat as we prepare.

This model then, proposes a way of describing how activity in the nervous system forms everyday consciousness.

You have probably heard the nervous system called a circuitry. Well, this theory takes that concept a step further and adds *life* to the circuitry. It describes the work done as activity circulates through the system. In short, this model is about *circulation* in the nervous system.

Specifically, this model is built on the idea that the conscious stream (a stream of separate conscious instants we call consciousness) is made when energy-driven trajectories travel through and around the circuitry of the nervous system and pass through the thalamus, a central part of the brain.

In this model, a trajectory is a series of neuron groups energized in turn. (Picture it as a sequence of lights flashing around a theater marquee or perhaps as a comet blazing through a series of dots spaced around the pathways of the nervous system.) When a trajectory passes through the thalamus, an instant of experience is inserted into our lifelong conscious stream. The instant of experience can be a sensation, thought, or feeling. For example, if a trajectory begins (that is, absorbs energy from the environment) at sensory tissue in the ear and passes through the thalamus, a sensation of sound is experienced in the conscious stream.

In this model, as we follow the trajectory, we first see how a conscious instant is actually experienced, then recorded, and later recognized. Then we see how patterns of cycling trajectories are generated. Finally, we see how patterns of trajectories circulating in the nervous system support emotional health, and by extension, social and environmental well-being, which in turn supports personal well-being.

A new technique

Where did these ideas come from? My personal interest began when, at about eleven years old, I wondered what caused feelings.

I wanted (with the naiveté of youth) to ensure I could bring good feelings into my life whenever I needed cheering up.

In those early years, I thought I could get what I was looking for (how feelings were formed) by reading psychology and philosophy books. But I couldn't find anything to explain how experiences occur moment by moment.

From the beginning, however, I believed experience had something to do with the body, because, when I closed my eyes, I quickly saw a different visual image. In other words, when I closed my eyes, my consciousness—of which sensations such as sight are a large part—immediately changed. And I noticed changes in sensation often lead to changes in what I was thinking and feeling—other forms of consciousness. So I knew sensation somehow depended on something happening in the body.

Then, in my teens, I read that the nervous system was the particular part of the body that was responsible for consciousness. So, when you put your hands over your eyes, you are actually preventing light waves from entering, preventing your nervous system from absorbing and using this energy.

I then began reading everything I could about neuroscience, physiological psychology, and related research.

Although interesting, these sources didn't offer a description of how experiences enter our conscious stream, second by second.

A new model comes into focus

With this scientific background in mind, however, and with the assumption that the nervous system was responsible for consciousness, I set out to find out the underlying processes that define the relationship between the nervous system and consciousness, including the emotional feelings I was still curious about.

I started by looking at the problem as if it were an equation. On one side, the nervous system, and on the other side, conscious experience. How can they be reconciled?

To best define the physical side of the equation, I immersed myself in the study of the physical nervous system—its organization and behavior. I learned about neurons—tiny electrochemical beings found in three-dimensional clusters and linked to form elaborate circuitry. I also learned that the nervous system is constantly exposed to a variety of energies from both the body tissue and the environment.

Then, on the conscious experience side of the equation, I wondered how I could define the intangible conscious stream more precisely. I found an answer when I began looking at consciousness as a reel. I saw consciousness as a lifelong reel of film in which each frame is a sensation, a thought, or a feeling. This metaphor worked because we experience a series of distinct conscious instants, and, like the separate frames of movie film, the separate instants of consciousness blur together to make a seamless experience.

After learning about the nervous system and defining the patterns of instants that make up conscious experiences, I began to compare the two kinds of information to learn how activity in the nervous system—often called a circuitry—could actually form the conscious stream. First I found qualities of the nervous system and conscious patterns that matched. Then I used these correlations to form a model—a model that

shows how experiences can be explained in terms of activity in the nervous system.

Among the first correlations I noticed between the nervous system and the nature of consciousness was that both have a definite cyclic character. The nervous system is often referred to as a circuitry because of its many connections and pathways that form circuits. Consciousness, on the other hand, is made up of sensations, thoughts and feelings—experiences that happen over and over, forming reoccurring patterns in the conscious stream. For example, we often experience patterns like these: thought → thought → feeling → sensation → feeling → sensation → thought → and so on.

With these repetitive patterns and neuroanatomical and neurophysiological characteristics in mind, I began to wonder *what has to happen* in the nervous system to make a particular experience occur? In other words, what causes the particular patterns I identified. Why do the patterns come in these typical familiar orders? What happens in me to enter the experience in my consciousness? What causes the: thought → thought → feeling → sensation → feeling → sensation → thought → and so on?

I looked for explanations, too, for other situations: What happens after experience fades? And, what happens to build an emotion?

As I continued to review these cyclic patterns and to review the structure and electrochemical nature of the nervous system, I laid the foundation of the two halves of the equation. A model emerged with this central concept: As energy is absorbed by (and converges in) the system, activity circulates in the nervous system's circuitry and, in doing so, supports the reoccurring events we experience in the conscious stream.

Focusing on the circuitry during my late teens, I began actively looking for the links between the nervous system and consciousness. At a medical school bookstore, I found texts that stressed a strong link between consciousness and a group of neuron groups near the center of the brain called the

thalamus. Therefore the model I developed uses the idea that the neuron groups of the thalamus and the pathways that enter and leave the thalamus are central to consciousness. They are the essential conscious circuits.

With these pathways and patterns in mind, clarifying the model was like rubbing the side of a crayon on a sheet of paper covering a leaf. After many passes of the crayon, the outline of a leaf is revealed, and, with more passes, details come into focus. So as the patterns of the conscious stream became more detailed, I was able to recognize and predict activity responsible for a wider range of experiences. The contours of the model gradually gained definition.

Relating to your experience

How closely does this model reflect reality? In reviewing this presentation, you can judge its validity yourself because you naturally have a rich intuitive understanding of how a system you use every day works. You are familiar with the same patterns I saw.

For example, you know that you experience a variety of sensations and feelings during the day. And you know you record them in some way because you can remember or summon up past sensations and feelings. You're also familiar with a range of emotions and know the experience of having those emotions evoked. You also realize that some emotions lead to certain thoughts and sensations. And, you know you can derive fresh thoughts and solve problems if you change the factors you are resolving. So your knowledge of how your conscious stream works is an inherent part of you.

I'm sharing these ideas because they are simply what seems true for me—for how I think I work. And if they relate well to your experience, we might use the model to find ways to be the best we can be, personally, socially and environmentally.

The description that follows, in eight chapters, begins with a physical description of the nervous system—viewed both traditionally (as established neuroscience) and theoretically

(with these new concepts). It ends with a theoretical description of activity that underlies emotional fitness.

- **Chapter 1** highlights the structure of the nervous system and explains how activity converges and diverges in circuitry-forming trajectories.
- **Chapter 2** describes how sensations enter the conscious stream and how they are experienced.
- **Chapter 3** explains how each instant of consciousness is recorded, building a network of records.
- **Chapter 4** shows how activity in the resulting network of records is resolved, providing us with recognition and orientation.
- **Chapter 5** explains how thoughts are derived by converging trajectories in the network.
- **Chapter 6** discusses how sensations and thoughts lead to a spectrum of simple, sustained, and released feelings.
- **Chapter 7** examines how patterns of sensations, thoughts, and feelings form activities.
- **Chapter 8** explains how patterns of these activities form a lifestyle and influence the quality of our lives. Understanding the roles of these patterns will help us to see how a healthy lifestyle supports physiological well-being, as well as the well-being of our society and environment. Integrity of the nervous system can be viewed as a state of soundness that nurtures and is beneficial to good health. In turn, personal health promotes health in society, as well as in the surrounding environment.

Notes

Notes

Chapter 1

The Physical Model: Circulating Trajectories

To understand how the conscious stream is formed, it's necessary to know a few things about the nervous system. In neuroscientific literature, much is now known about the strong, spongy, soft, and sinewy “gray matter” we call the nervous system.

For this discussion, we need only to understand those elements of the nervous system—both traditional and theoretical—that explain its relationship to consciousness. We'll start with a sketch of the structure we need, and then see how the energy absorbed by the structure generates trajectories. In succeeding chapters, we'll see how these trajectories perform an important role in the formation of each person's stream of consciousness.

Structure: neurons and *conscious pathways*

Central to the nervous system is the brain. Its surface is covered with a number of interfacing neuron groups—three-dimensional clusters of neurons—that fit together like pieces in a quilt design. This “quilt” of layered neurons is called the cortex. Neurons, as we will see, make connections by using two kinds of branches: short dendrites and the often longer axons. Both kinds of branches extend throughout the