

THE MATTHEW FOUNDATION
Virtual Event in collaboration with
Stanford Down Syndrome Research Center



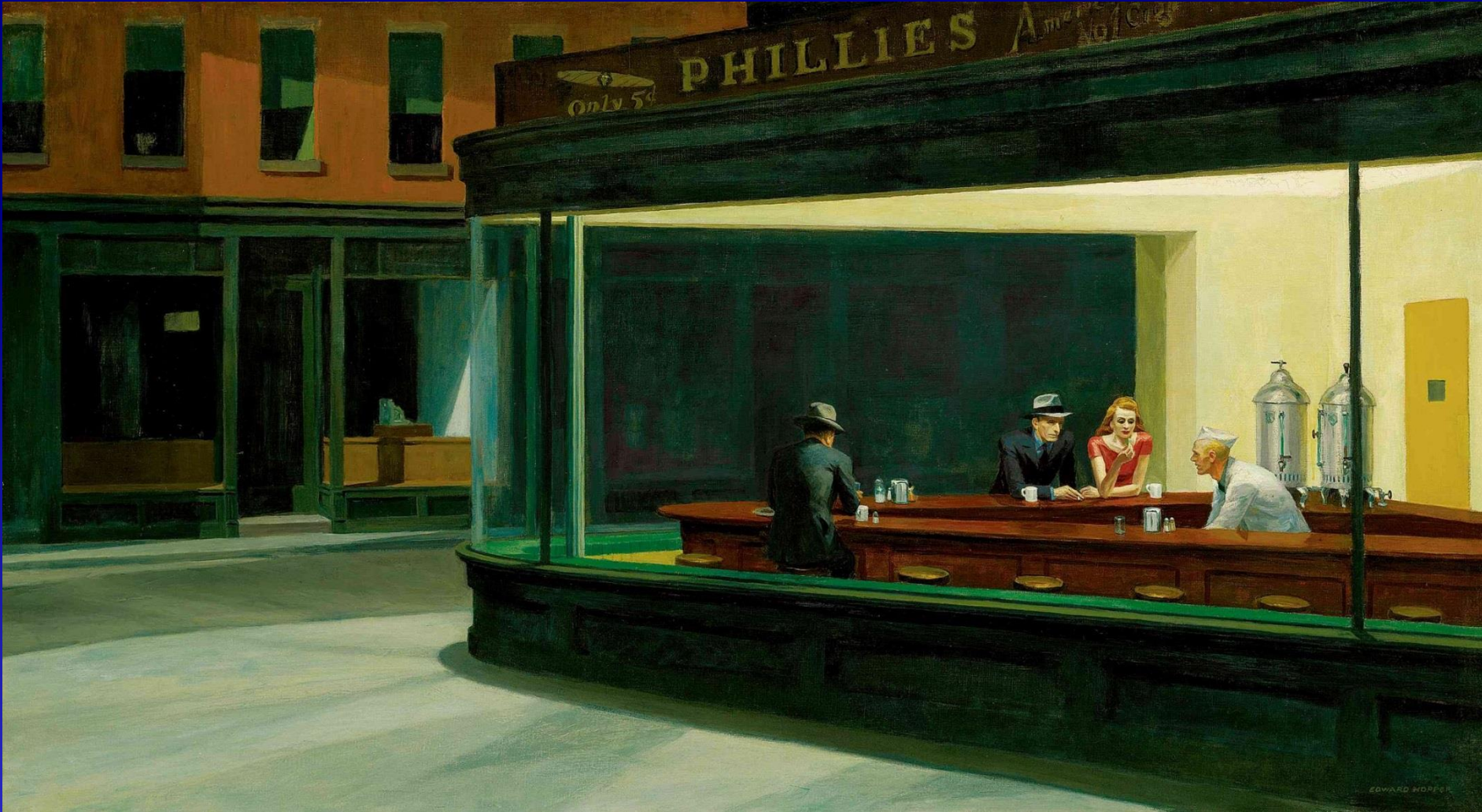
**Importance and challenges of
SLEEP**

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SCHOOL OF MEDICINE

Sleeping is the most natural and powerful form of self-care we have



Edward Hopper 1942

Sleep is a natural restorative physiological process that is characterized by perceptual disengagement and must be rapidly reversible



“Dream to Remember, Dream to Forget”

Functions of sleep

- Higher-order cognitive function involving mechanisms of learning and memory and synaptic plasticity



- Restorative function including maintenance of brain energy metabolism, macromolecular biosynthesis, and removal of metabolic waste

Your life is reflected in your sleep



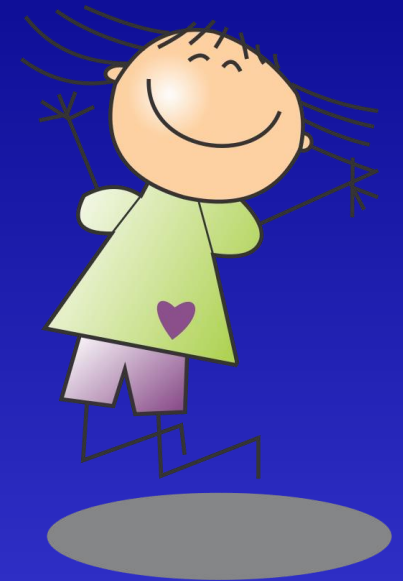
Your sleep is a reflection of your life

**The need for sleep is
biological
The way you sleep is
learned**

What wakes you up may not
be what keeps you awake

You should not wake up feeling tired

Remember being 7 or 8 years old and when you woke up realized you did not have to go to school?



Sleep History: 4 Elements

Amount

Quality

Timing

State of Mind

**What is your motivation to go to bed
and get out of bed?**

Irregular Sleep Wake Cycle

Variable sleep time

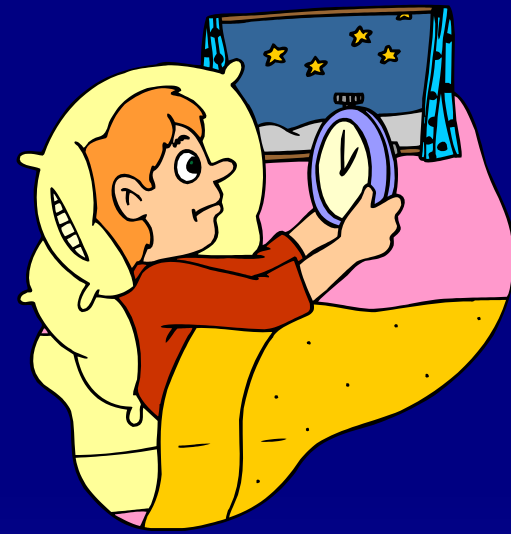
(not necessarily the bed time)

Variable wake up time

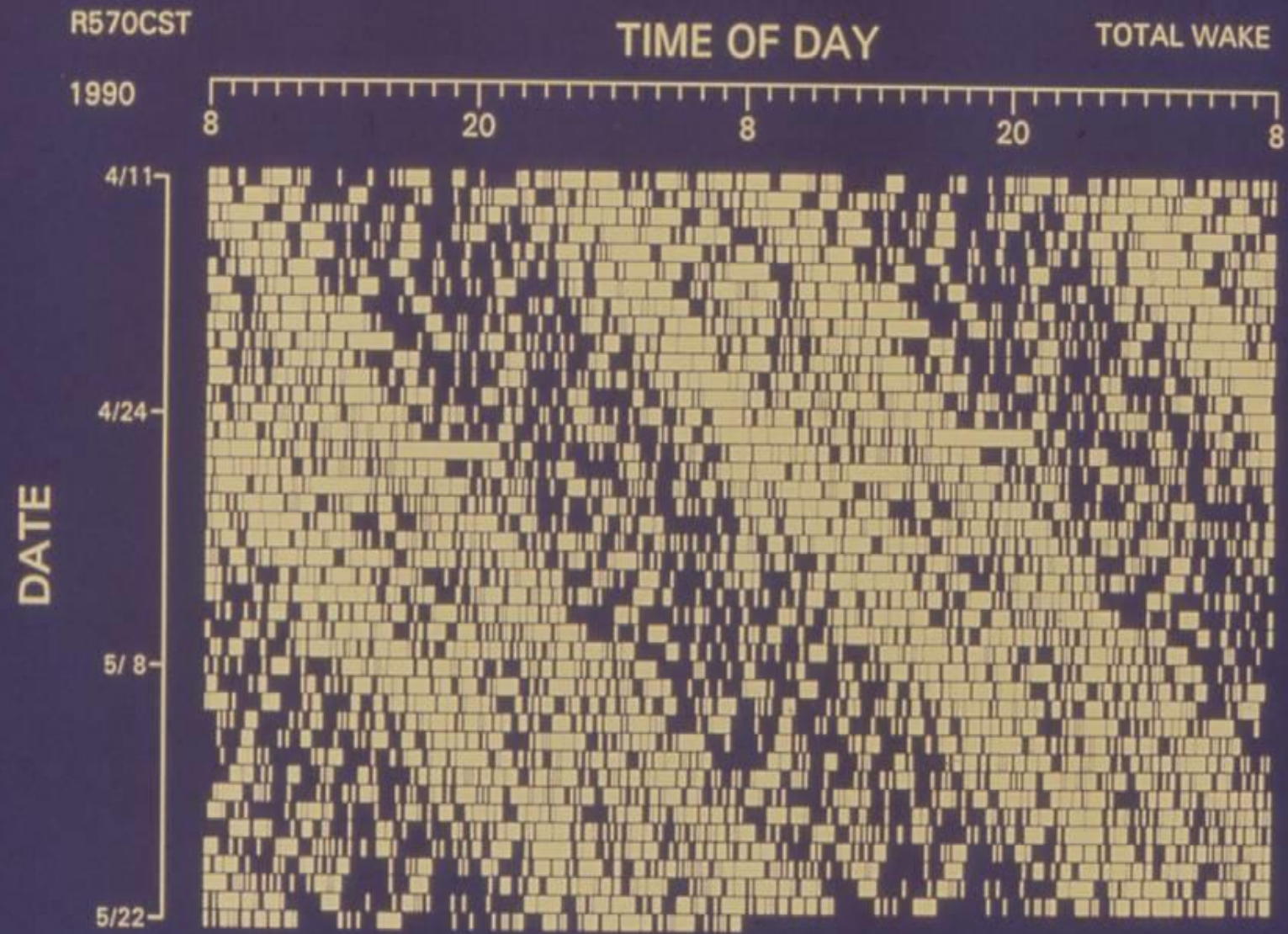
(not necessarily the out of bed time)

Variable nap time

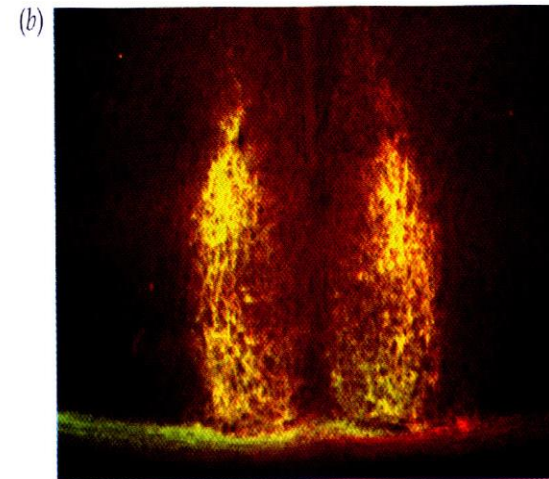
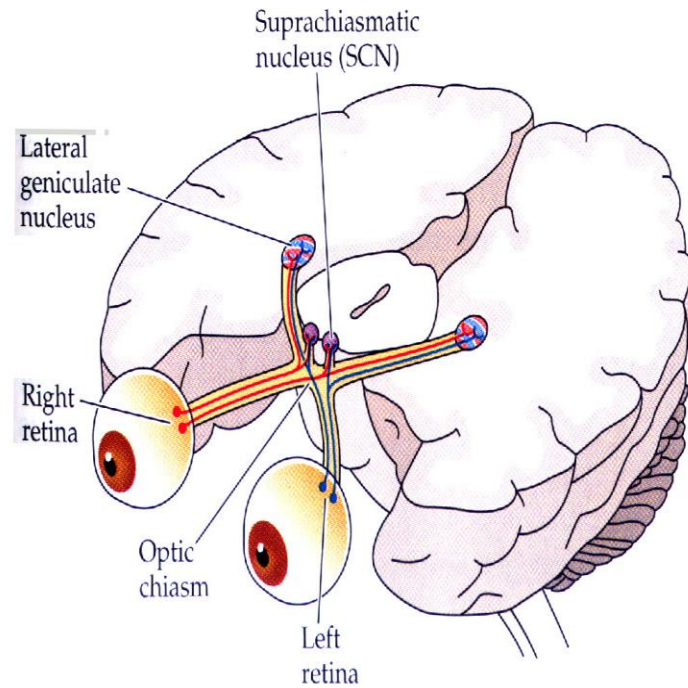
Sleep Timing



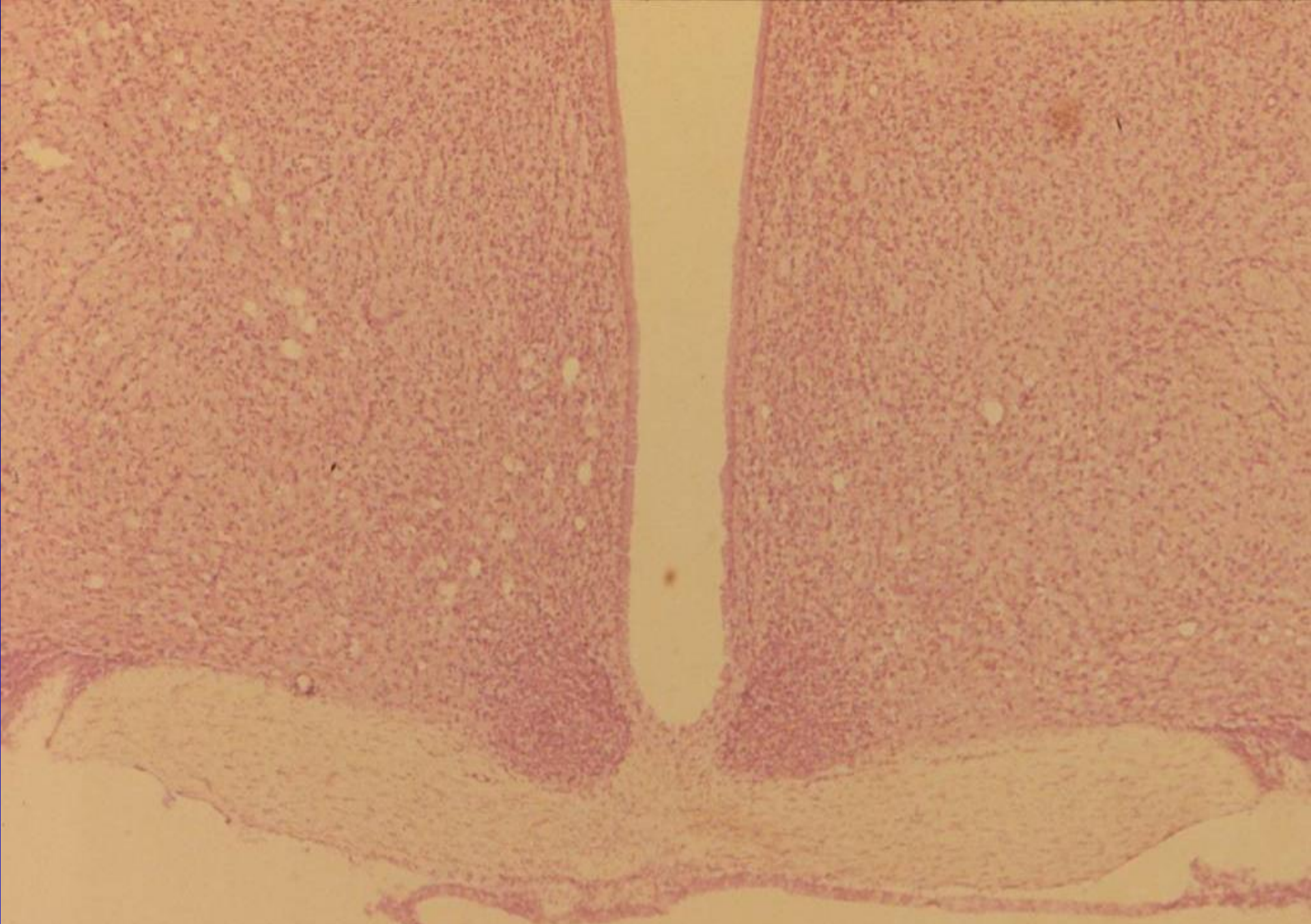
- Sleep timing is influenced by homeostatic and circadian factors
- The less we sleep the more sleep we need and vice versa
- Twice a day our alertness level peaks
- Twice a day our sleepiness peaks



Courtesy of Dale Edgar
PhD



14.5 The Retinohypothalamic Pathway in Mammals (a) This pathway carries information about the light–dark cycle in the environment to the SCN. For clarity of synaptic connections, the SCN is shown proportionately larger than other features. (b) Axons (seen at the bottom of the image) from the left eye are labeled red, while those from the right are green. Both eyes project so diffusely to the two overlying SCN that they are outlined in yellow. (Photograph courtesy of Cynthia L. Jordan.)

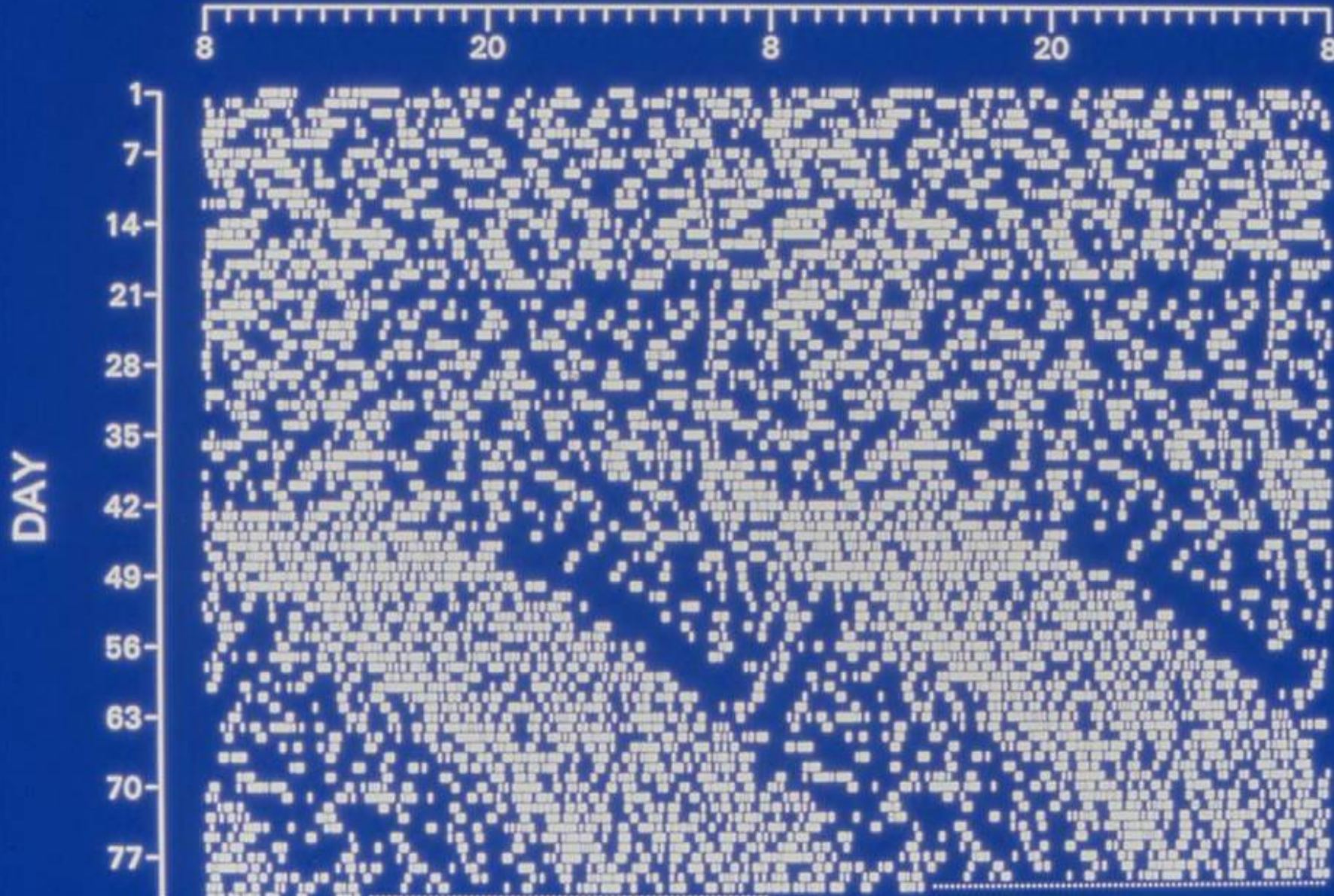


Courtesy of Dale Edgar PhD

R1000X

TIME OF DAY

DRINKING



Courtesy of Dale Edgar PhD



2017 Nobel Prize in Physiology/ Medicine awarded for discoveries of molecular mechanisms controlling the circadian rhythm



Do you really want to sleep like a baby?



**The first thing that happens when you don't sleep well is
you become irritable and inattentive**



The effects of poor quality sleep on brain function and risk taking in adolescence *NeuroImage 2013*

- Examined how poor sleep quality relates to cognitive control and reward related CNS function during risk taking in 46 teens using fMRI
- Adolescents who reported poorer sleep also exhibited greater risk-taking. This association was paralleled by less recruitment of the dorsolateral prefrontal cortex during cognitive control, greater insula activation during reward processing, and reduced functional coupling between the DLPFC and affective regions including the insula and ventral striatum. These results suggest that poor sleep may exaggerate the normative imbalance between affective and cognitive control systems, leading to greater risk-taking in adolescents

Kids falls asleep because they are bored: **WRONG**

Monotony does not cause sleepiness



Monotony does unmask sleepiness



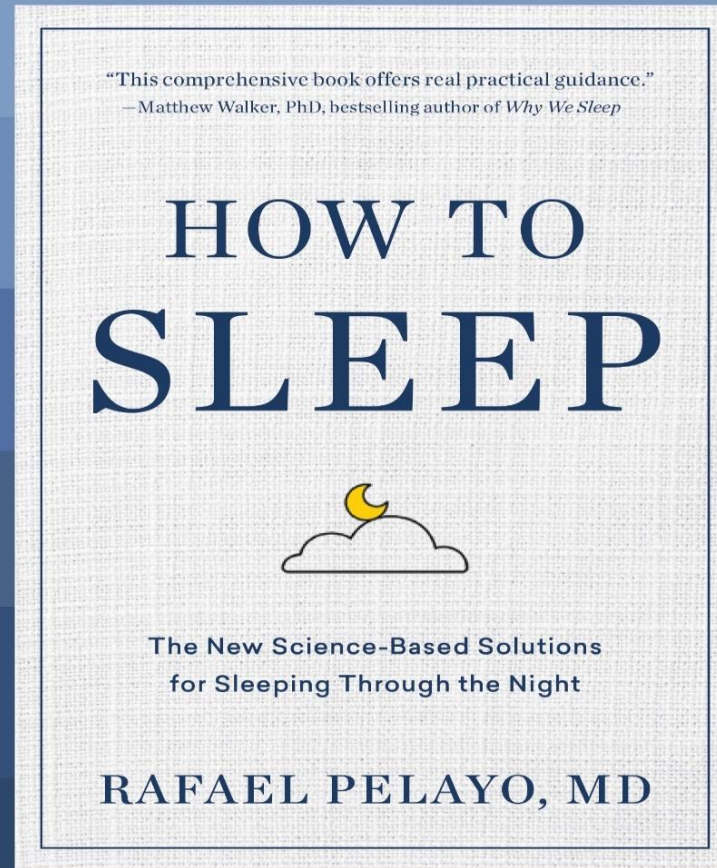
Do not to equate sedation with normal sleep!



Paradoxical Reaction To A Hypnotic Medication



Wishing you all a good night tonight and every night



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