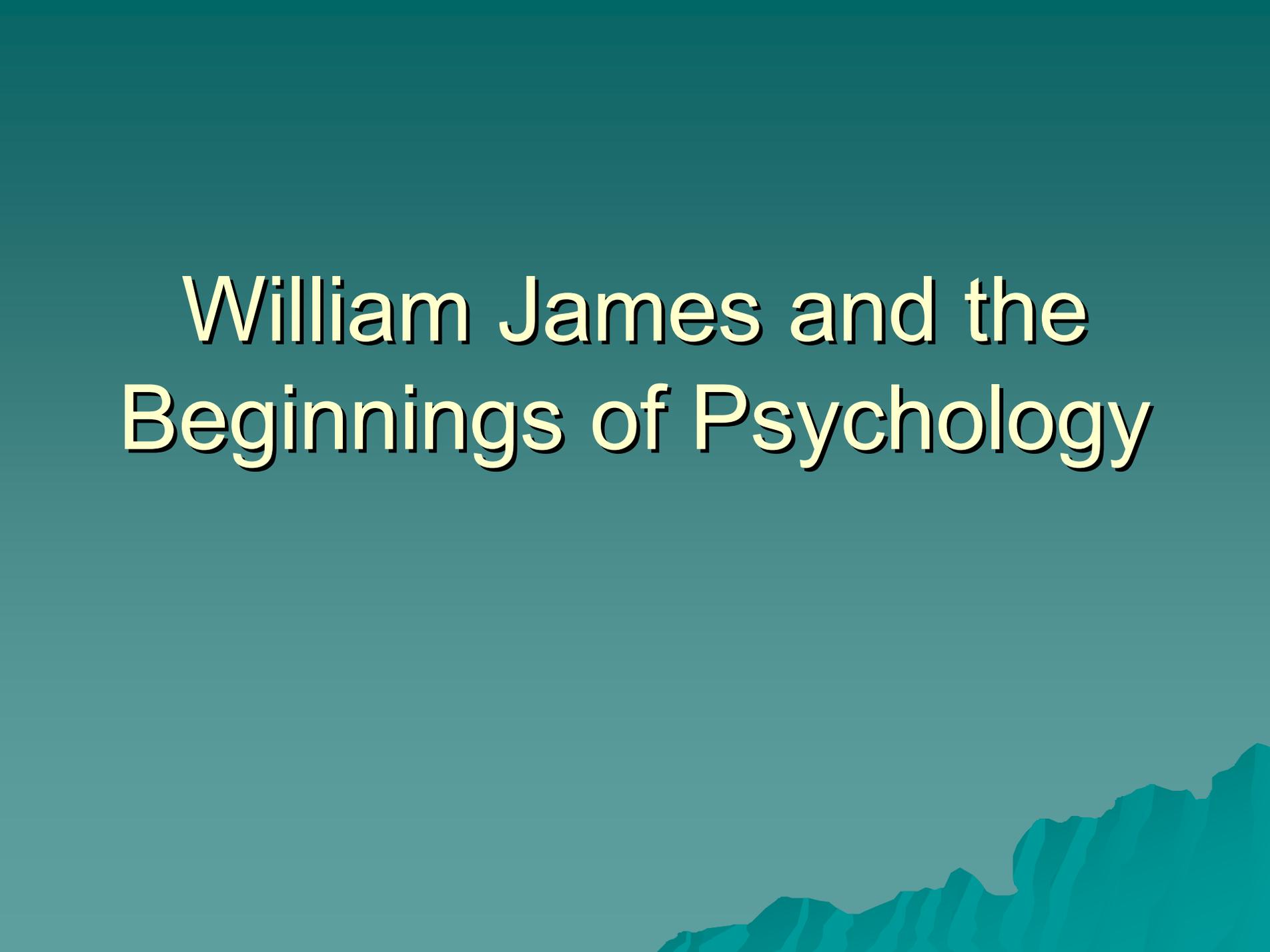


# William James and the Beginnings of Psychology

The background is a solid teal color. At the bottom of the image, there is a silhouette of a mountain range with jagged peaks, rendered in a slightly darker shade of teal.

# First Bridges from Physics to the Mental: Psychophysics

- Psychophysics emerged in the mid-19<sup>th</sup> century as the scientific study of relationships between physical stimuli and perceptual phenomena
- Its strategy was to quantify the relationship between physical intensity of a stimulus and its perceived intensity

# Ernst Heinrich Weber (1795-1878)— anatomist, then physiologist at Leipzig

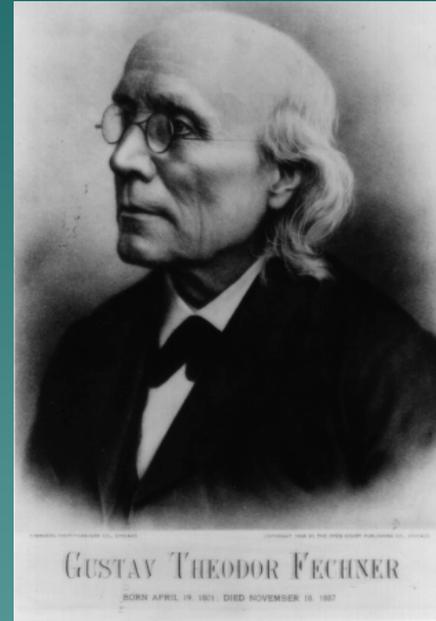
How sensitive is our ability to sense differences in weight when we lift weights versus have them laid on our skin?

- introduced jnd's—just noticeable differences
- observed that jnd's were a ratio of absolute magnitude:  
could detect increase of  $1/40$  in lifting, but only of  $1/30$  when placed on skin
- also interested in ability to discriminate points of touch on fingers: could distinguish 1 millimeter on back of fingers, only 40-60 millimeters

# Gustav Fechner (1801-1887)—physicist, then philosopher at Leipzig

- Formalized Weber's law:

$$\Delta R/R = K$$



- Established a relation between stimulus intensity and sensation intensity

$$S \text{ (intensity of sensation)} = k \log R \text{ (stimulus)}$$

# Hermann Ebbinghaus (1850-1909)

Inspired by Fechner to find mathematical order in higher cognitive processes—learning and memory

Examined number of repetitions of reading lists in time with metronome that were required before perfect recall

To avoid bias of prelearned associations, used nonsense syllables: zok, vam, etc.

- longer lists—more trials required (plotted curve)

Studied forgetting by counting number of repetitions required to relearn list

- logarithmic forgetting curve

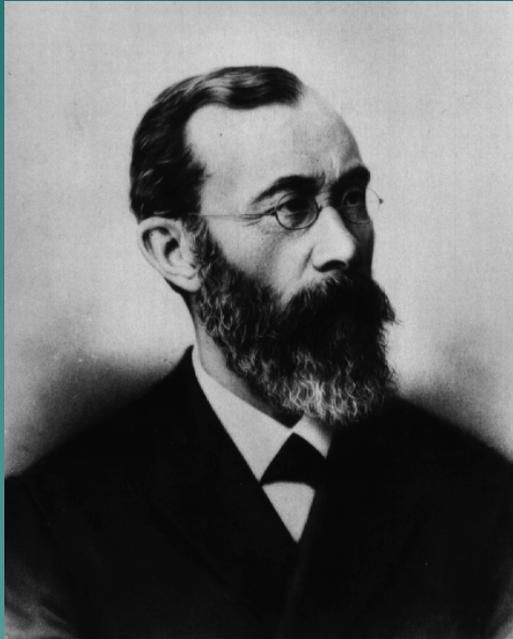
# Frans Cornelis Donders (1818-1889) MD, University of Utrecht

Reaction times to differentiate individual  
mental activities

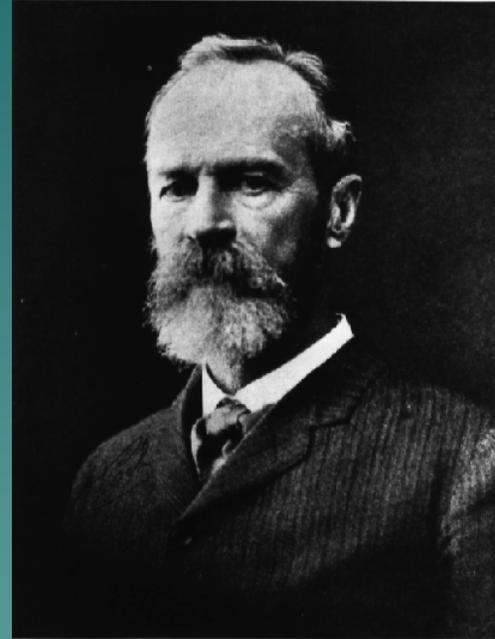
subtractive method—if two tasks  
differ in that one requires one  
additional operation, subtract the time  
of the shorter task from the longer to  
determine the time of the component  
operation



# Establishment of the Discipline



Wilhelm Wundt



William James

# Wilhelm Wundt (1832-1920), Professor of Philosophy at Leipzig after 1875

Research assistant for Hermann Helmholtz

- unconscious inference in perception

*Beiträge zur Theorie der Sinneswahrnehmung* (1862)

book on perception, but offered a plan for psychology

- a science of psychology based on experiment, observation of behavior, and self-observation
- includes Völkerpsychologie—the study of linguistic, moral, and religious differences between ethnic groups

# Wundt's Vision

Laboratory: Institute of Experimental Psychology (1879)—  
expanded over 20 years to occupy a floor of a building

Journal: *Philosophische Studien* (mostly by students and affiliates)

186 Ph.D.s, many international students

James McKeen Cattell—word associations

G. Stanley Hall

Edward Titchner—introspection of elements

One example—program in psycholinguistics: emphasis on *mental representation* as constructed prior to speech—the grammar used would emphasize one or another part of the representation

# Status of Introspection

Became associated with Wundt as *the* method of psychology largely as a result of his American student—Titchner

Involves reporting on the contents of one's own conscious states

Status of introspection—not just asking what goes on in one's mind, but reporting on the contents of one's mind—press a button when you recognize a word

A major target of the behaviorists

# William James (1842-1910); MD— physiology, then philosophy at Harvard

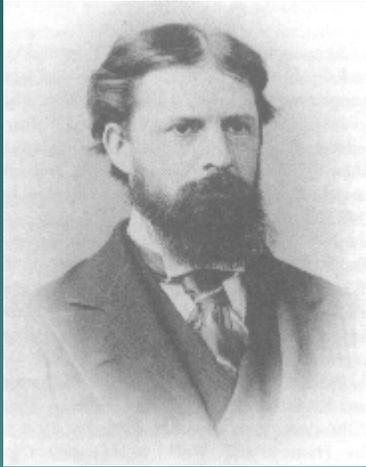
1875: Teaching laboratory at Harvard

James was not an experimentalist  
Method was rather to reflect on mental life, drawing upon  
the findings of others

1890: *Principles of Psychology* “the empirical correlation of the  
various sorts of thought or feeling [as known in consciousness] with  
definite conditions of the brain.”

For the most part James was a naturalist in his treatment of  
the mind

# Peircean pragmatism and Darwinism

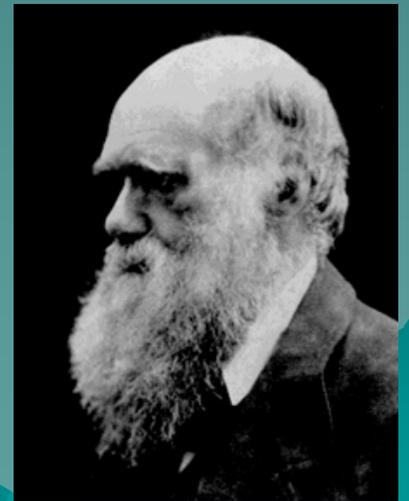


Truth often characterized as correspond, but how can we establish correspondence?

Peirce's pragmatic attitude about truth: "The true is the name of whatever proves itself to be good in the way of belief, and good, too, for definite, assignable reasons"

Darwin: natural selection focuses on the contribution of traits to survival. James focused on the contribution of aspects of mental life.

With James the combination of pragmatism and Darwinism developed into functionalism



# James' Functionalism

James' role in psychology can be compared to Darwin's role in biology.

- Whereas Darwin collected biological specimens and then tried to account for them in terms of natural selection, James first collected mental phenomena, particularly experienced mental phenomena, and then tried to subject them to explanation.
- Mode of explanation-- functionalism and pragmatism. That is, James tried to explain what goals our mental life serves. Less interested in giving a structural description of it.
- Assumption of such a phenomenological approach--that mental life is something that is or can be made conscious.

# James' Characterization of Mental Life

Mental life:

- 1. Is purposeful and willful.** *"The pursuance of future ends and the choice of means of their attainment are thus the mark and criterion of the presence of mentality in a phenomenon."*
- 2. Exhibits intentionality.** *"The psychologist's attitude towards cognition . . . is a thoroughgoing dualism. It supposes two elements, mind knowing and thing known, and treats them as irreducible."*
- 3. Is something of which we are aware.** Not something hidden

# Mental life continued

- 4. is private, personal, and uniquely one's own.** "In this room--this lecture room, say--there are a multitude of thoughts, yours and mine, some of which cohere mutually, and some not. . . . My thought belongs with *my* other thoughts, and your thought with *your* other thoughts. Whether anywhere in this room there be a *mere* thought, which is nobody's thought, we have no means of ascertaining, for we have no experience of its like. The only states of consciousness that we naturally deal with are found in particular consciousness, minds, selves, concrete particular I's and you's."
- 5. is always changing, in flux.** There is no single constant feature of our mental states and each occurrence of a mental state is different (although we may experience the same thing more than once)

# Mental life continued

- 6. is sensibly continuous, if flows like a stream.**  
Perception of continuity without anything being constant.
  - 7. is selective, attentive, and interested; it is excited by some features of the world, not by others.** The ability to select is learned. As a result of being selective, mental life is active, not passive.
- 

# Functionalism applied to consciousness

Rejects the view that consciousness is a thing—a separate mind, a parallel entity, or a brain state

Rather it is a function: there are conscious activities that are the activities of a brain working in an environment. "I mean . . . to deny that the word stands for an entity, but to insist most emphatically that it stands for a function."

Focus on how the functions of consciousness might have been selected, not on what consciousness is.

How does being conscious benefit us? Could we do the same things as we do without consciousness?

# James on Emotions

“Our natural way of thinking about these standard emotions is that the mental perception of some fact excites the mental affection called the emotion, and that this latter state of mind gives rise to the bodily expression. My thesis on the contrary is that the bodily changes follow directly the PERCEPTION of the exciting fact, and that our feeling of the same changes as they occur IS the emotion. Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. The hypothesis here to be defended says that this order of sequence is incorrect, that the one mental state is not immediately induced by the other, that the bodily manifestations must first be interposed between, and that the more rational statement is that **we feel sorry because we cry, angry because we strike, afraid because we tremble**, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be. Without the bodily states following on the perception, the latter would be purely cognitive in form, pale, colourless, destitute of emotional warmth. We might then see the bear, and judge it best to run, receive the insult and deem it right to strike, but we could not actually feel afraid or angry.”

# Changing one's emotions

“Whistling to keep up courage is no mere figure of speech. On the other hand, sit all day in a moping posture, sigh, and reply to everything with a dismal voice, and your melancholy lingers. There is no more valuable precept in moral education than this, as all who have experience know: if we wish to conquer undesirable emotional tendencies in ourselves, we must assiduously, and in the first instance cold-bloodedly, go through the outward motions of those contrary dispositions we prefer to cultivate. The reward of persistency will infallibly come, in the fading out of the sullenness or depression, and the advent of real cheerfulness and kindness in their stead. Smooth the brow, brighten the eye, contract the dorsal rather than the ventral aspect of the frame, and speak in a major key, pass the genial compliment, and your heart must be frigid indeed if it do not gradually thaw!”

# James on Habit

“Habit is thus the enormous fly-wheel of society, its most precious conservative agent. It alone is what keeps us all within the bounds of ordinance, and saves the children of fortune from the envious uprisings of the poor. It alone prevents the hardest and most repulsive walks of life from being deserted by those brought up to tread therein. It keeps the fisherman and the deck-hand at sea through the winter; it holds the miner in his darkness, and nails the countryman to his log-cabin and his lonely farm through all the months of snow; it protects us from invasion by the natives of the desert and the frozen zone. It dooms us all to fight out the battle of life upon the lines of our nurture or our early choice, and to make the best of a pursuit that disagrees, because there is no other for which we are fitted, and it is too late to begin again. It keeps different social strata from mixing.

# James on habit (continued)

Already at the age of twenty-five you see the professional mannerism settling down on the young commercial traveller, on the young doctor, on the young minister, on the young counsellor-at-law. You see the little lines of cleavage running through the character, the tricks of thought, the prejudices, the ways of the 'shop,' in a word, from which the man can by-and-by no more escape than his coat-sleeve can suddenly fall into a new set of folds. On the whole, it is best he should not escape. It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again.”

# James on Free Will

"Let psychology frankly admit that *for her scientific purposes* determinism can be *claimed*, and no one can find fault. If, then, it turn out later that the claim has only a relative purpose, and may be crossed by counter-claims, the readjustment can be made. Now ethics makes a counter-claim; and the present writer, for one, has no hesitation in regarding her claim as the stronger, and in assuming that our wills are "free." For him, then, the deterministic assumption of psychology is merely provisional and methodological."

# More on Free Will

"the most that any argument can do for determinism is to make it a clear and seductive conception, which a man is foolish not to espouse, so long as he stands by the great scientific postulate that the world must be an unbroken fact, and that prediction of all things without exception must be ideally, even if not actually, possible. It is a *moral* postulate about the Universe, the postulate that *what ought to be can be, and that bad acts cannot be fated, but that good ones must be possible in their place*, which would lead to the contrary view."