

“The most artistic lesson I ever heard”
- a contribution to the reflection on the comment
made by William James regarding a lesson by Ernst
Mach

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William James in Europe (1882)

Comments regarding Mach and Helmholtz's lessons in letters to his wife and to Carl Stumpf:

"the most artistic lesson I ever heard" – about Mach's lesson (G. Holton, 1993)

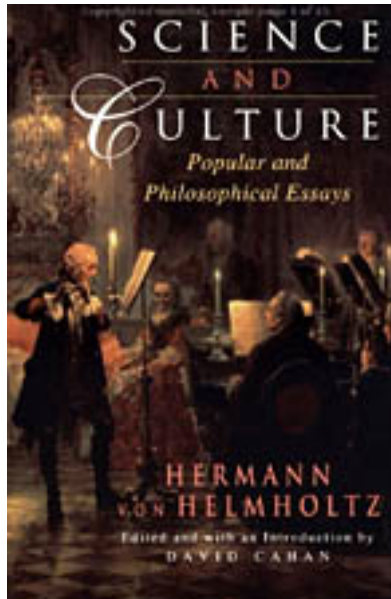
"Helmholtz... gave me the very worst lecture I ever heard in my life except one" (E. Hiebert, 1976)

"I don't think anyone ever gave me so strong an impression of pure intellectual genius. He apparently has read everything and thought about everything, and has an absolute simplicity of manner and winningness of smile when his face lights up that are charming" (J. Bernstein, 1986).

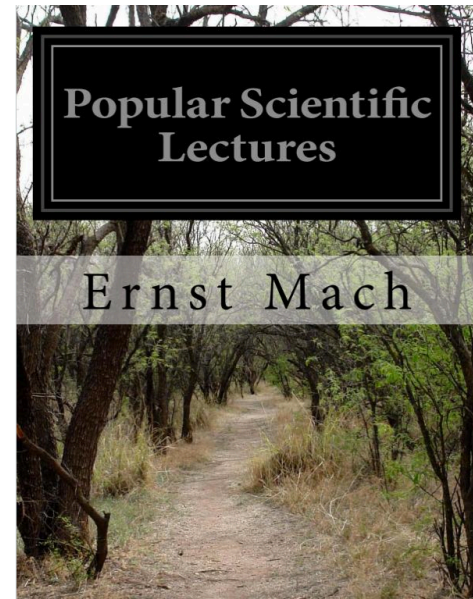
the question

What about the possible traits of Ernst Mach's lessons which had so strongly impressed James?

Methodology



Lectures 1853 – 1892
Edited by David Cahan,
1995
(There is an edition of
1895 with an introduction
by Tyndall with less
lectures)

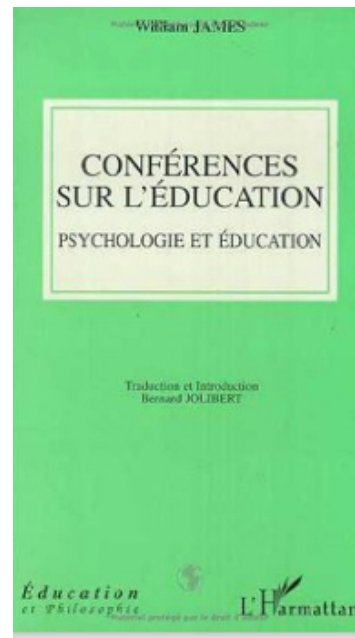


Lectures 1864-1898
(first edition 1894
with less lectures, I
used 1986 edition
with an Introduction
by J. Bernstein)

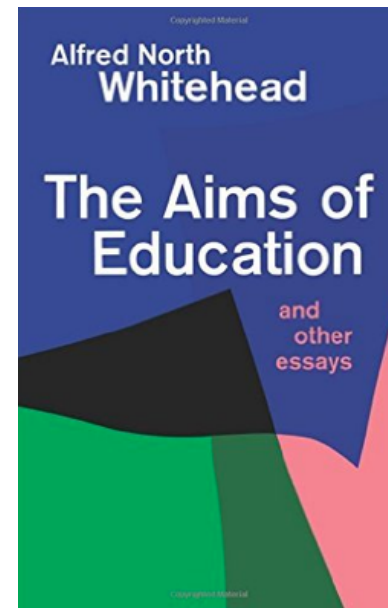
Methodology

**TALKS TO TEACHERS
ON PSYCHOLOGY: AND TO
STUDENTS ON SOME OF LIFE'S
IDEALS. By WILLIAM JAMES**

NEW YORK
HENRY HOLT AND COMPANY
1916



Talks – 1892 – first edition 1899



First edition - 1929

“As I became bigger and stronger I went about with my father and my schoolfellows a great deal in the neighbourhood of my native town, Potsdam, and I acquired a great love of Nature. (...) Here there was a copious and multifarious region, with the mighty fulness of Nature, to be brought under the dominion of a mentally apprehended law. And, in fact, **that which first fascinated me was the intellectual mastery over Nature,** which at first confronts us as so unfamiliar, by the logical force of law. But this, of course, soon led to the recognition that **knowledge of natural processes was the magical key which places ascendancy over Nature in the hands of its possessor**” (p.384). Helmholtz, “An autobiographical sketch” (jubilee 1891).



“Thus both harmony and dysharmony alternately urge and moderate the flow of tones, while the mind sees in their immaterial motion an image of its own perpetually streaming thoughts and moods. Just as in the rolling ocean, this movement, rhythmically repeated, and yet ever varying, rivets our attention and hurries us along. But whereas in the sea, blind physical forces alone are at work, and hence the final impression on the spectator’s mind is nothing but solitude – in a musical work of art the movement follows the outflow of the artist’s own emotions” (Helmholtz, p.46 e p.75).

“I must here conduct you a portion of the way – as short as possible – over the uninviting field of mathematico-mechanical ideas, in order to bring you to a point of view from which a more rewarding prospect will open” (Helmholtz, p.20)

“Every motive that prompts and stimulates us to modify and transform our thoughts, proceeds from what is new, uncommon, and not understood. Novelty excites wonder in persons whose fixed habits of thought are shaken and disarranged by what they see” (Mach, p.224)

- “It is through change of circumstances that the natural philosopher learns. This process, however, is by no means confined to the investigator of nature. The historian, the philosopher, the jurist, the mathematician, the artist, the aesthetician, all illuminate and unfold their ideas by producing from the rich treasures of memory similar, but different, cases; thus they observe and experiment in their thoughts” (Mach, p.230).

“Our love for nature is inventive” (Mach, p.83)

“We cannot mark out in hard and fast lines the science of the future, but we can foresee that the rigid walls which now divide man from the world will gradually disappear; that **human beings will not only confront each other, but also the entire organic and so called lifeless world, with less selfishness and with livelier sympathy**” (Mach, p. 213)

“un second concordat pédagogique devrait enseigner aux futurs ingénieurs l’ancienneté colossale et l’exquise fragilité des habitats où ils auront à installer leurs activités. Je rêve que le Muséum d’histoire naturelle redevienne le centre du Quartier Latin” (M. Serres, 2015, p.216)

According to James:

"you must simply work your pupil into such a state of interest in what you are going to teach him that every other object of attention is banished from his mind; then reveal it to him so impressively that he will remember the occasion to his dying day. (...)

divination and perception, not psychological pedagogies (...) are the only helpers here"

Boutroux (1910) testifies to the nature of James's pedagogy in his strong relation to life itself, and in this sense his key concept is "to experiment", meaning "not coldly to observe a thing happening outside us, but to undergo, to feel within oneself, to live oneself this or that manner of being" (cited by H. Bergson, p.223)

"Without the adventure of romance, at the best you get inert knowledge without initiative, and at the worst you get contempt of ideas - without knowledge" (A. Whitehead)

G. Allan (2012) regarding Whitehead's romance concept:

"it involves not only apprehension, appreciation, and interest but also their iteration until they become habits of the heart and mind (...). We are becoming used to asking questions and seeking new experiences, imagining novel possibilities and ferreting out their implications".

“Liquids have no form of their own! No, not for the superficial observer. But persons who have observed that a raindrop is round and never angular, will not be disposed to accept this dogma so unconditionally” (p.3) (1868)

“Statues and ‘plaster’ casts of syrup are undoubtedly things of fancy, even on the moon, but maple-syrup would flow so slowly there that we could easily build a maple-syrup man on the moon” (Mach, p.4)

“Accordingly, if liquids have no form of their own with us on earth, they have perhaps, a form of their own on the moon” (Mach, p.4)

“As a fact, we now see, to our surprise, that the oil, instead of spreading out into a layer, or lying in a formless mass, assumes the shape of a beautiful and perfect sphere, freely suspended in the mixture, as the moon is in space” (p.5)



“The stereoscope was one of the major optical devices of the century [XIX], which was enormously widespread, and which played an important part in the changed vision of the later part of the century” (Castel and Sismondo, 2003, p.31).

“the hero of my novel would be a cockchafer, venturing forth in his fifth year for the first time with his newly grown wings into the light, free air. Truly it could do no harm if man would thus throw off his inherited and acquired narrowness of mind by making himself acquainted with the worldview of allied creatures” (Mach, p.86)

“But the stereoscope accomplishes still more than this. It can visualise things for us which never see equal clearness in real objects (...). For example, if we photograph a machine stereoscopically (...). I have employed this method for obtaining transparent stereoscopic views of anatomical structures” (Mach, 74)

“I will invite you to take a walk with me? We see before us a wood. What is that makes this real wood contrast so favorably with a painted wood, no matter how perfect the painting may be?” (Mach, p.68)

“Mach’s disquisitions, which were preceded by a historical introduction supplemented by appropriate philosophical commentary, were original (...).

Mach accompanied his lectures with beautiful experiments, which he performed himself”

Novák, cited by E. Těšínská (p.83)

"Inventive genius requires pleasurable mental activity as a condition for its vigorous exercise"

A. Whitehead

Mach – an artistic and inspiring teacher



A model Scenario of the Flying Classroom, Martin Honert, 1995