

Search & Browse

- Simple Search
- Advanced Search
- Browse by Subject
- Browse by Year
- Browse by Conferences/Volumes
- Latest Additions

Information

- Home
- About the Archive
- Archive Policy
- History
- Help
- FAQ
- Journal Eprint Policies
- Register
- Contact Us

News

- Guide to new PhilSci-Archive features.

Huygens's 1688 Report to the Directors of the Dutch East India Company on the Measurement of Longitude at Sea and the Evidence it Offered Against Universal Gravity

Schliesser, Eric and Smith, George E. (2000) *Huygens's 1688 Report to the Directors of the Dutch East India Company on the Measurement of Longitude at Sea and the Evidence it Offered Against Universal Gravity*. [Preprint]



PDF
[Download \(2316Kb\)](#) | [Preview](#)

Abstract

When Christiaan Huygens prepared the 1686/1687 expedition to the Cape of Good Hope on which his pendulum clocks were to be tested for their usefulness in measuring longitude at sea, he also gave instructions to Thomas Helder to perform experiments with the seconds-pendulum. This was prompted by Jean Richer's 1672 finding that a seconds-pendulum is 1 1/4 lines (2.8 mm) shorter in Cayenne than in Paris. Unfortunately, Helder died on the voyage, and no data from the seconds-pendulum ever reached Huygens. He nevertheless did receive data from his clocks on the return-voyage from the Cape of Good Hope to Texel. When he first calculated the ship's course according to these data, it appeared to have gone straight through Ireland. He then tried introducing a correction to the data, based on an idea he had previously entertained as a possible explanation of Richer's finding: he corrected the observed time to compensate for a reduction in the effect of gravity from the Poles to the Equator resulting purely from the Earth's rotation. His newly calculated course convinced him that this rotational effect is the sole source of any variations in gravity with latitude. This paper examines Huygens's corrections to the data and his reasoning from the new course to the conclusion that nothing else causes a variation in gravity. In the process, we show that Huygens had cogent empirical reasons to reject Isaac Newton's theory of universal gravity, which predicted a somewhat larger variation in gravity.

Export/Citation: [EndNote](#) | [BibTeX](#) | [Dublin Core](#) | [ASCII \(Chicago style\)](#) | [HTML Citation](#) | [OpenURL](#)

Social Networking: [Share](#) |

Item Type: Preprint

Keywords: Huygens, Newton, Universal Gravity, Longitude Research,

Subjects: [General Issues > History of Philosophy of Science](#)
[General Issues > History of Science Case Studies](#)

Depositing User: [Eric Schliesser](#)

Date Deposited: 15 Aug 2010

Last Modified: 07 Oct 2010 11:19

Item ID: 5510

URI: <http://philsci-archive.pitt.edu/eprint/5510>

Actions (login required)



View Item

Document Downloads

ULS D-Scribe



This site is hosted by the [University Library System](#) of the [University of Pittsburgh](#) as part of its [D-Scribe Digital Publishing Program](#)

E-Prints



Philsci Archive is powered by [EPrints 3](#) which is developed by the [School of Electronics and Computer Science](#) at the University of Southampton. [More information and software credits.](#)

Share

Feeds



Atom



RSS 1.0



RSS 2.0