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REACTION-PROPELLED MANNED AIRCRAFT CONCEPTS, 1670-1900 - THE PRECURSORS TO  
UNMANNED AND MANNED SPACECRAFT CONCEPTS, A SURVEY**Abstract**

The names of Konstantin Tsiolkovsky, Robert H. Goddard, Hermann Oberth, and Robert Esnault-Pelterie are well known in the literature of the history of astronautics for developing, from the late 19th century and into the early 20th century, among the earliest known concepts of rocket-propelled unmanned and manned spacecraft.

In 1971, Ramon Carreras presented an IAF paper on the 1872 concept of a rocket-propelled aircraft by the Spaniard Frederico Gomez Arias. Other IAF and other history papers have also dealt with individual early pioneers of reaction-propelled aircraft concepts.

In 1959, Jules Duhem produced the book *Histoire des Origines du vol a Réaction* (History of the Origins of Reactive Flight). However, although this is an excellent survey of both concepts and experiments towards reactive flight, it is difficult book to obtain and is not as well known.

Thus, there is a gap in the literature of the history of rocketry and in the history of technology in general, on the history of the one of the most significant applications of the rocket—its potential use in propelling aircraft that may be considered precursors to the earliest concepts of unmanned and manned spacecraft.

This paper draws material from the work of Carreras and Duhem and also from many other sources not fully examined, especially patents, and covers several hitherto unknown pioneers. Included in this survey are the concepts of Honore Fabry (1670), James Nye (1852), Konstantin Konstantinov (1856), et. al.