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**The Scientific Background of Swift’s Voyage to Laputa**

**(Excerpts)**

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Among the travels of Gulliver, the *Voyage to Laputa* has been most criticized and least understood. There is general agreement that in interest and literary merit it falls short of the first two voyages. It is marked by multiplicity of themes; it is episodic in character. In its reflections upon life and humanity, it lacks the philosophic intuition of the voyages to Lilliput and Brobdingnag and the power of the violent and savage attacks upon mankind in the *Voyage to the Houyhnhnms*. Any reader sensitive to literary values must so far agree with the critics who disparage the tale. But another criticism as constantly brought against the *Voyage to Laputa* cannot be so readily dismissed. Professor W. S. Eddy, one of the chief authorities upon the sources of *Gulliver’s Travels*, has implied the usual point of view when he writes:

*“There seems to be no motive for the story beyond a pointless and not too artfully contrived satire on mathematicians…. For this attack on theoretical science I can find no literary source or analogue, and conclude that it must have been inspired by one of Swift’s literary ideocyncracies [sic]. Attempts have been made to detect allusions to the work of Newton and other contemporary scientists, but these, however successful, cannot greatly increase for us the slight importance of the satire on Laputa”.*

Three themes in the *Voyage to Laputa* have been particularly censured by modern critics. Some are repelled by the Laputans with their curious combination of mathematics and music and their dread of a comet and the sun. Others are disturbed by the apparent lack of both unity and significance in the Balnibarians, particularly in the Grand Academy of Lagado. Most of all, the Flying Island has puzzled commentators who dismiss it as a “piece of magical apparatus”, a “gratuitous violation of natural laws” which offends the reader’s sense of probability.

Yet is it conceivable that Swift, elsewhere so conscious of the unwritten law of probability, should have carelessly violated it in the *Voyage to Laputa* alone? Professor Eddy in a later work has justly said:

*The compound of magic and mathematics, of fantasy and logic, of ribaldry and gravity, is a peculiar product of the disciplined yet imaginative mind of Swift. There are two distinct kinds of imagination: one is creative and mystical, the other is constructive and rational. Swift had no command over the faerie architects who decree pleasure domes in Xanadu without regard to the laws of physics. His imagination, like that of Lewis Carroll, had a method in its apparent madness…. What seems so lawless is the product of the most rigid law”.*

Swift’s imagination, we have long recognized, was eclectic; the mark of his genius lay less in original creation than in paradoxical and brilliant new combinations of familiar materials. Indeed, one of the sources of his humour to every generation of readers has been the recognition of old and familiar themes treated in novel fashion. Pygmies and giants, animals with the power of speech, have been the perennial stuff of fairytale and legend. The novelty in *Gulliver’s Travels* lies less in the material than in new combinations and the mood of treatment. The study of the sources of Swift has been particularly rewarding in showing what the “constructive and rational” imagination may do to time-honoured themes. The very fact that the literary and political background of *Gulliver’s Travels* has been established so completely leads the inquisitive reader to inquire whether the unrecognized sources of the *Voyage to Laputa may* not be equally capable of verification. If the most assiduous searchers into sources can find “no literary source or analogue” for the peculiar themes in this voyage alone, must not those sources be sought elsewhere than in the literary traditions which Swift inherited?

There were other important materials accessible to writers of romance and fantasy in Swift’s generation, of which many availed themselves. The attempt of this study will be to show that Swift borrowed for the *Voyage to Laputa* even more than for the other tales, but that the sources of his borrowings were different. The mathematicians who feared the sun and comet, the projectors of the Grand Academy, the Flying Island—these came to Swift almost entirely from contemporary science. The sources for nearly all the theories of the Laputans and the Balnibarians are to be found in the work of Swift’s contemporary scientists and particularly in the *Philosophical Transactions of the Royal Society*.

The section of the *Voyage to Laputa* which deals with the mathematical peculiarities of the Laputans has been generally recognized to be of a piece with others of Swift’s pronouncements upon mathematicians. Although several of the critics incline to think that such satire is peculiar to Swift, there is little in the main idea of this section that is unique. Behind the Laputans lay the rapidly growing interest of the seventeenth century in mathematics, embodied in the work of Kepler, Descartes, Leibnitz and many others, and a persistent attitude of the seventeenth century layman toward the “uselessness” of physical and mathematical learningBacon’s discrimination between “Experiments of Light” and “Experiments of Fruit” had only put into pictorial language a persistent conflict between “pure” and “applied” science. To the layman, and particularly to the satirist of the last quarter of the seventeenth century, when the Royal Society was attracting its greatest attention, the apparent “uselessness” of the new science was a common point of attack. Samuel Butler in *Hudibras* and in minor poems, Shadwell in the *Virtuoso*, Ned Ward in the *London Spy*, William King in the *Dialogues of the Dead*—these and a host of minor writers laughed at the impractical *virtuosi*. A close parallel for Swift’s point of view in *Gulliver’s Travels* may be found in the *Spectator* papers, those mirrors of the age. In spite of Addison’s profound response to many of the new concepts of the day—his interest in Cartesianism, in Newtonianism, his fascination with the vastly expanded universe of astronomy and biology—he lost no chance for laughter at impractical experimenters and at absent-minded mathematicians who in their preoccupation with one subject forgot the world about them.

Swift’s Laputans excel in theoretical learning; the abstractions of “higher mathematics” are their meat and drink. They can solve equations—but they cannot build houses, because of the “contempt they bear to practical geometry, which they despise as vulgar and mechanic”. Unfortunately their theoretical learning is too abstruse and “too refined for the intellectuals of their workmen”. One may well wonder whether the passage in which Swift discusses their sharp divergence between theory and practice reflects a point of view suggested by many of the theorists of the day, and expressed by Robert Boyle in these words:

“Let us now consider how far the knowledge of particular qualities, or the physical uses of things, will enable men to perform, philosophically, what is commonly done by manual operation. And here, methinks, ’tis a notable proof of human industry, as well as a great incitement thereto, that philosophy can supply the want to strength, or art, and the head prevent the drudgery of the hand”.

If a specific source must be found for Swift’s laughter at the uselessness of mathematical learning, it may be discovered in Fontenelle’s “Defence” of mathematical and natural philosophy and in his insistence that such publications as those of the Royal Society and the Paris Academy justified themselves. Swift’s attitude toward Fontenelle is shown clearly in his earlier work, *The Battle of the Books*, which was largely a reply to Fontenelle’s defence of the “moderns”. Another paper by Fontenelle so clearly suggests the position that Swift attacks in the *Voyage to Laputa* that it seems impossible it should not have been in Swift’s mind when he wrote. In 1699 Fontenelle, as part of his defence of the “moderns”, had upheld mathematical learning in a preface to the *Memoirs of the Royal Academy at Paris*, which was republished as a preface to the *Miscellanea Curiosa* in 1707. The general points attacked by Swift are to be found in this preface. Fontenelle begins his defence:

“But to what purpose should People become fond of the Mathematical and Natural Philosophy? Of what use are the Transactions of the Academy? These are common Questions, which most do not barely propose as Questions, and it will not be improper to clear them. People very readily call useless, what they do not understand. It is a sort of Revenge; and as the Mathematicks and Natural Philosophy are known but by few, they are generally look’d upon as useless.”

There are striking similarities between the aspects of science defended by Fontenelle and attacked by Swift.

Fontenelle proceeds with a defence of such “useless” knowledge, pointing out on the one hand that supposedly theoretical learning has resulted in practical discoveries, but, on the other hand, defending the intellectual curiosity of mathematicians and natural philosophers as an end in itself. “Altho’ the Usefulness of Mathematicks and Natural Philosophy is obscure”, he declares, “yet it is real”.

The “contempt they bear to practical geometry” is sufficient to explain the miscalculation of the Laputan tailors in making Gulliver’s clothes. The mistaking of “a figure in the calculations” may be intended as a satire upon Newton, as has been suggested. But like the corresponding passage in the *Voyage to Lilliput*, in which tailors make clothes for the “man mountain”, the passage in the *Voyage to Laputa* in which the tailor “first took my altitude by a quadrant” is chiefly a satire upon the current interest in surveying and particularly upon attempts to determine the altitude of the sun, moon, stars and mountains, both lunar and terrestrial, by quadrants and other instruments. Many such papers are included in the *Philosophical Transactions*; the original paper is frequently followed by a rejoinder on the part of another mathematician, pointing out errors in either method or calculation.

But the mathematical interests of the Laputans are not, as a rule, satirized alone; they are included with their interest in music, for in Laputan minds, mathematics and music are one, as they suggest in their clothing, their food and their customs. Here again Swift follows an attitude common enough in the seventeenth century, reflecting Kepler, Descartes, Newton, Leibnitz; more specifically, his ideas go back to Dr. John Wallis, who contributed many papers to the Royal Society on the general subject of the analogies between music and mathematics, prefacing his “discoveries” by the suggestions that they “may not be unacceptable to those of the Royal Society, who are Musical and Mathematical”. In music and mathematics, many writers of the seventeenth century found the two eternal and immutable verities. Indeed, the mathematician and astronomer, Christian Huygens, went so far as to declare that, no matter how inhabitants of other planets might differ from man in other ways, they must agree in music and geometry, since these are “everywhere immutably the same, and always will be so”. The interest of the Laputans in music is not, as has frequently been suggested, a satire upon the interest shown in London in Swift’s day in opera; the Laputan interest is diametrically opposed and shows the Laputans on the side of those who were resisting the idea that music was a handmaiden to language. Swift’s main point is that the Laputans are concerned with the theory, not with the application, of both mathematics and music. Like many of Swift’s contemporaries, they expressed their theory of music in mathematical formulae.The Laputans, we are told, express their ideas “perpetually in lines and figures”. Such lines and figures—almost equally divided between mathematical and musical symbols—Gulliver saw displayed upon their garments and in the King’s kitchen, where “all kinds of mathematical and musical instruments” were used to cut the food into “rhomboides” and “cycloids”, flutes, fiddles and hautboys. It was entirely natural that, with ideas of beauty founded upon the “Proportions” of music and mathematics, the Laputans should have transferred their figures of speech from one realm to another:

“If they would, for example, praise the beauty of a woman, or any other animal, they describe it by rhombs, circles, parallelograms, ellipses, and other geometrical terms, or by words of art drawn from music.”

No specific source is needed for such an idea; and in view of the long succession of the predecessors of the Laputans who had found evidence of eternal and perfect beauty in mathematics and music, no specific source can really be posited. Yet the musico-mathematical notions of the Laputans may be conveniently found in a paper by the Reverend T. Salmon on *“The Theory of Musick reduced to Arithmetical and Geometrical Progressions”*. The paper followed an earlier one in which Salmon had reported a *“Musical Experiment before the Society”*, the propositions of which were: “That Music consisted in Proportions, and the more exact the Proportions, the better the Music”. In his second paper, Salmon discussed “the Theory of Music, which is but little known in this Age, and the Practice of it which is arriv’d to a very great Excellency”, both of which, he suggested, “may be fixed upon the sure Foundations of Mathematical Certainty”. He offered in conclusion two tables “wherein Music is set forth, first Arithmetically, and then Geometrically”. It required only one more step for the Laputans to apply the certain “Proportions” of music and mathematics to the praise of feminine beauty.

**Sources**

Marjoire Nicolson—Nora M. Mohler: *The Scientific Background of Swift’s Voyage to Laputa* In [*Annals of Science*](http://www.tandf.co.uk/journals/tf/00033790.html) **2** (1937) pp 299—334

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