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Citation	待兼山論叢. 哲学篇. 2022, 56, p. 1-14
Version Type	VoR
URL	<a href="https://hdl.handle.net/11094/94854">https://hdl.handle.net/11094/94854</a>
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# The effect of *imaginatio* on the body as discussed in Northern Europe's first scientific journal

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Keywords: *imaginatio* / monstrous birth / maternal imagination /

*Acta medica et philosophica Hafniensia* / 17th century

## 1. Introduction

*Imaginatio* was one of the subjects that spanned both areas of philosophy and medicine in the early modern period. At that time, the relationship between *imaginatio* and the onset and treatment of diseases and the reproduction of things such as nevus and monstrous birth was being discussed. Children with deformities were often featured in various publications as monsters, and part of this was considered to be due to the mother's *imaginatio*.

This study examines how the relationship between *imaginatio* and the body was perceived in the fields of medicine and natural philosophy in the early modern period, based on some articles in one of the first scientific journals published in the latter half of the 17th century.

## 2. Background and Purpose

In ancient Greece, Aristotle distinguished *phantasia* from the faculties of the soul such as sensation, judgment, knowledge, and intelligence. According to Aristotle, *phantasia* is closely linked to desire and must be a movement resulting

from the exercise of a power of sensation<sup>1)</sup>. This basic understanding of Aristotle's *phantasia* was maintained throughout the Middle Ages; however, at some point, the effect of *phantasia* (*imaginatio*) on the body began to attract attention in the medical field<sup>2)</sup>. In early modern Europe, the Latin term *imaginatio* came to be used for the Greek term *phantasia*.

In the early modern period, many books refer to the *imaginatio* effect on the body. Among them, references to *imaginatio* from the medical and physiological perspectives can be divided into two types. The first type explains the effects of *imaginatio* on the body and its mechanism. The second type reports various cases of monstrosity (anomaly, deformity, etc.) while referring to *imaginatio* as the cause.

Pietro Pomponazzi (1462-1525), who studied medicine and philosophy in Padua and became a professor of natural philosophy at the University of Padua and professor of philosophy at the University of Bologna, considered the power of *imaginatio* and desire to control the mind and blood; consequently, the imagined and desired object was produced. He also held that *imaginatio* is able to influence externally through *spiritus* and that it treats the body. Thomas Feyens/Fienus (1567-1631), professor of medicine at Louvain, in *De viribus imaginationis tractatus* (1608), argued how the maternal *imaginatio* affects the fetus through the movement of the *spiritus* and body fluids<sup>3)</sup>. Giulio Cesare Vanini (1585-1619), who published *De admirandis naturae reginae deaeque mortalium arcanis* (1616), also maintained that a pregnant woman's *imaginatio* was imprinted on the fetus. He mentioned the association between *imaginatio* and health, believed that *imaginatio* affects blood and *spiritus*, and thought that *laetus* (joyful, glad) *imaginatio* affects others by producing *hilarus* (hilarious) blood and *spiritus*<sup>4)</sup>.

In contrast to these works, Ambroise Paré (1510-1590), a French surgeon, in *Des monstres et prodiges* (1573), discussed the causes of anomaly (deformity) in

various cases, one of which was the *imaginatio* of the mother during pregnancy<sup>5)</sup>. Felix Platter (1536-1614), a city physician of Basel, also discussed the causes of anomaly (deformity) in his *Praxeos seu de cognoscendis, praedicendis, praecauendis, curandisq[ue] affectibus homini incommodantibus* (1609). He discussed the causes of various mental and physical ailments and disorders. Platter used *imaginatio*, one of the three traditional categories of inner senses, to explain the causes and treatment of both mental and physical disorders. In addition, Fortunius Licetus (1577-1657), who studied philosophy and medicine at the University of Bologna, taught philosophy at the University of Padua, and then became a professor of theoretical medicine at the University of Padua, wrote *De Monstrorum caussis, natura et differentiis libri duo* (1616). He discussed anomaly (deformity) caused by the maternal *imaginatio*, not paternal.

Previous studies of maternal *imaginatio* and monstrous birth from the Renaissance to the early modern period include the individual works mentioned above and their influence, as well as references to the first description of each anomaly<sup>6)</sup>. Furthermore, many studies refer to Michel de Montaigne's (1533-1592) *Les Essais* (1580) as a source for understanding humanistic *imaginatio* and monstrous birth in the second half of the 16th century<sup>7)</sup>. However, although previous studies have focused on individual works and discussed their interpretation and influence, fewer studies have focused on the general understanding shared among contemporaneous physicians. Therefore, this paper will use journals as a source material, and will not focus on specific works but rather on a wide range of contemporaneous medical professors and physicians to clarify their understanding of the relationship between *imaginatio* and the body.

### 3. Materials

This study focuses on the *Acta medica et philosophica Hafniensia* (1673-1680), published in Denmark in 1673. This journal was the first scientific journal in Northern Europe, edited by Thomas Bartholin (1616-1680), a famous Danish anatomist. It was also the earliest journal of medicine and natural philosophy in Europe as a whole, following the *Miscellanea curiosa sive ephemeridum medicophysicarum* (1670-). The first part of *Acta medica et philosophica Hafniensia* contains reports from professors of medicine and physicians in Denmark and other European countries. For example, Nicolaus Steno (1638-1686), a distinguished Danish anatomist, had 10 articles published in this journal. I reevaluated one of his articles “De vitulo hydrocephalo” (1673), in which Steno refuted the theory that the monstrous birth was due to the maternal *imaginatio*<sup>8)</sup>. However, it remains unclear whether Steno’s arguments were pioneering in the context of contemporaneous medicine and natural philosophy or whether they represented the general views.

In this study, I extracted 9 articles in which *imaginatio* (*phantasia*) was found in *Acta medica et philosophica Hafniensia* from approximately 600 articles. The results of this study clarify how *imaginatio* was understood in medicine and natural philosophy in the late 17th century. Although the terms *imaginatio* and *phantasia* appear throughout the journal, only articles that explicitly referred to the presence or absence of effects on the body were included in the analysis in this study.

### 4. Results: Variations of the effects of *imaginatio* on the body

Using the previously mentioned 9 articles in *Acta medica et philosophica*

*Hafniensia*, the specific examples in each article were analyzed to determine how the effects of *imaginatio* (*phantasia*) on the body were discussed<sup>9)</sup>. Only in “De Naevis Maternis” was the term *phantasia* used instead of *imaginatio*, like in “Matris Phantasia.”

The analysis allowed the subject matter to be classified into the following categories: deformities, abnormal hair or skin color, birth of a non-disabled child by a disabled person, nevus, disease and treatment, and death. Some articles included several cases reported in a discussion and some spanned multiple classifications (Table 1).

Table 1. Articles on effects of *imaginatio* on the body in *Acta medica et philosophica Hafniensia*

Volume No.	Author	Title	Subject
2 I	Thomas Bartholin	Gravidarum imaginatio	deformity color of hair
2 LXXXII	Olaus Borrichius	Gravida aspectu mutili mutilum peperit silium	deformity
3 XIII	Johann Ludwig Hannemann	De hiatu palati & uvulae	deformity
3 LIX	Oliger Jacobaeus	Monstra cruribus intortis, & capreae figura	deformity color of skin
3 LXXX	Johan Valentin Willius	De semine animalium	non-disabled child
3 LXXXIII	Johan Valentin Willius	De naevis maternis	nevus
4 XL	Thomas Bartholin	Curatio miraculosa	disease treatment
5 XV	Georgius Hannaeus	Antipathia singularis, nomen proprium aversantis	disease treatment
5 L	Olaus Borrichius	Alia imaginantium exempla	death

“Gravidarum imaginatio,” for example, a discussion categorized as a report of deformity, cites the birth, in August 1673 in Copenhagen, of a child with a deformed upper and lower limb, which was caused by a pregnant woman who saw a beggar with a similar limb and could not forget the image throughout her pregnancy<sup>10)</sup>. Similar cases were reported in “Gravida aspectu mutili mutilum peperit silium”.

In this journal, the article that reports deformities in the most detail in relation to *imaginatio* is “Monstra cruribus intortis, & capreae figura.” In this

report, a dog with inverted legs was observed during pregnancy, resulting in the birth of a child with a similar lower limb deformity. Figures are included along with a record of the observations. This case also described the imperforate anus and intestinal and genitourinary abnormalities that are often observed as complications of limb dysplasia. The report states, “Immane quantum in praegnantibus valeat imaginatio, quas embryoni insculpat figuras!” and points out the influence of the pregnant woman’s *imaginatio* on the fetus<sup>11)</sup>.

As with other kinds of deformity, in “De hiatu palati & uvulae,” *imaginatio* is stated to cause cleft lips and palates<sup>12)</sup>. “Gravidarum imaginatio” also contains examples of reported hair and skin abnormalities. It cites the case of a child with black hair on one side of the head and white hair on the other and attributes the child’s abnormality to the mother having struck one side of her head against a sack of coal during pregnancy, after which she and frequently suffered from this *imaginatio*. Moreover, in “Monstra cruribus intortis, & capreae figura,” the author cites an example from Utrecht a few years prior to this report, where a pregnant woman gave birth to a dark yellow-skinned baby because she often gazed at the Ethiopian statue placed in front of a house that sold nicotiana.

For other types, a case was reported in “De Semine Animalium” in which a child without disabilities was born to a person with disabilities, and it was noted that the *imaginatio* and nutrition of the pregnant woman did not affect the fetus.

One article explicitly connected nevus with *phantasia*. In this article, the mother’s strong desire brought about a nevus in the form of the object of her desire in the child.

In the “Curatio Miraculosa”, Dr. Jacobus Henricus Paulli, son of the famous Simon Paulli, reports examples of *imaginatio* in diseases and treatments, in which a sick person had a dream, and the power of *imaginatio* led to their recovery. However, the comments to this report refused, the power of *imaginatio* leading to the recovery from the disease, and the devil as the cause of it.

In addition, "Alia imaginantium exempla" introduces an example of *imaginatio* causing death, but in these cases, gender was not considered.

## 5. Discussion

### 5-1. Characteristics of *Acta medica et philosophica Hafniensia*

The characteristics of *Acta medica et philosophica Hafniensia* and the authors of each article are first summarized. The journal contains a number of articles on medicine and natural philosophy from Denmark, Norway, and Iceland, as well as from neighboring countries. The articles cover a diverse range of subjects, such as medicine, geology, meteorology, and mineralogy. Among the articles on medicine are reports on injuries and their treatment, dissection, pregnancy and childbirth, and deformities. In addition to Thomas Bartholin, the authors of the previously mentioned 9 articles are: Ole Borch, with the Latinized name Olaus Borrichius (1626-1690), professor of chemistry and botany at the University of Copenhagen; Johann Ludwig Hannemann (1640-1724), professor of medicine and philosophy at the University of Kiel; Oliger Jacobaeus (1650-1701), professor of medicine, philosophy, and history at the University of Copenhagen; Johan Valentin Willius (1651-1677), a physician in Copenhagen; and Georgius Hannaeus (1647-1699), a physician in Odense. All of them published multiple articles in this journal.

The authors tended to be Danish physicians or university professors, but the journal also included letter reports from Paris, Leiden, and other foreign cities<sup>13)</sup>. In addition, in 17th-century Denmark, many who obtained medical degrees learned at the Universities of Leiden, Padua, and others. It can be said that Denmark had been able to obtain medical knowledge and skills from other European countries. Therefore, the journal's understanding of *imaginatio* and its relationship to monstrosity is not limited to a particular country or region; it

reflects the understanding and thought of Europe as a whole.

## 5-2. Maternal imagination and monstrous birth

First, *imaginatio*, especially of pregnant women, and monstrous birth or nevus had often been the subjects of discussion in the 15th-18th centuries. The present study confirmed that the power of the *imaginatio* was understood to extend to the causes of diseases, treatments, and even death. Second, in all cases analyzed in this study, the influence of childbirth was attributed to the woman, not to the man. However, in cases related to diseases, treatment, or death, the influence of *imaginatio* was mentioned regardless of gender.

The journal contains reports of deformities other than those discussed in this paper; however, it was observed that not all cases attributed the cause of anomaly (deformity) to *imaginatio*. In such cases, the characteristics of the anomaly (deformity) were described concisely, without reference to their cause.

The relationship between *imaginatio* and anomaly (deformity) is also prominent in cases of limb dysplasia, such as congenital limb deficiency; however, it is absent in cases such as conjoined twins. The limb dysplasia case can be considered as a kind of archetype in the relationship between *imaginatio* and monstrous birth. No cases used the term *imaginatio* when reporting the deformity of animals.

## 6. Conclusion

Most of the 9 articles discussed in this paper accepted the effects of *imaginatio* on the body, but some of them maintained that there was no such association. *Acta medica et philosophica Hafniensia* included reports in letter form not only from Denmark but also from abroad, suggesting that it reflected the general understanding of the field of medicine and natural philosophy in

contemporaneous Europe as a whole.

In this context, Nicolaus Steno in his “De vitulo hydrocephalo” published in this journal reported on the dissection of a case of hydrocephalus in Innsbruck, and he denied the effect of the mother’s *imaginatio* on anomaly, even though he introduced a general discourse on its effect. Through his dissection of a calf, he indirectly debunked the effect of the maternal *imaginatio* through the anatomical explanation that the cause of the increasing head circumference was due to hydrocephalus and by pointing out that the cause can be attributed to fetal malfunction. Steno’s pioneering attempt to explain deformities without reference to *imaginatio*, faculties of the soul, or *spiritus* should thus be reevaluated.

In the 17th century, the argument about the *imaginatio* and its effects on the body reached its peak, influenced by a multitude of factors, including a growing interest in natural history and pathology, the continuation of traditional medicine, and the rapid transmission of case reports through journals that were founded during this period. Although the physiological aspect of *imaginatio* was retained until the end of the 18th century, it was no longer discussed thereafter<sup>14)</sup>. One reason for this was the emphasis on the field of physiology, to the point that explanations of elements, *spiritus*, and the faculties of the soul became gradually detached from the field of medicine. In particular, the theory that maternal *imaginatio* affects the body was rejected by James Augustus Blondell and others<sup>15)</sup>.

The relation between *imaginatio* and the body in medicine and natural philosophy in the second half of the 17th century will require further study through a comparison with other journals, taking into account the multiple factors mentioned above.

This work was supported by JSPS KAKENHI, Grant-in-Aid for Young

Scientists (B), Grant Number 20K12908.

[Notes]

- 1) Aristotle, *De Anima*, 29a1-3.
- 2) On Aristotle and *imaginatio*, see below. O'Brien J (1993), Sepper D L (2018).
- 3) In *Acta medica et philosophica Hafniensia*, Thomas Fienus and Fortunius Licetus were referred to in some articles.
- 4) Vanini G C (1616), p. 435.
- 5) Paré A (1628), chapter IX.
- 6) See Huet M H (1993), Fischer-Homberger E (1979).
- 7) Dagron T (1968).
- 8) See Anzai N (2017).
- 9) Bartholin T. "Gravidarum Imaginatio" (1675b), Borrichius O. "Gravida aspectu mutili mutilum peperit filium" (1675), Hannemann J L. "De hiatu palati & uvulae" (1677), Jacobaeus O. "Monstra cruribus intortis, & capreae figura" (1677), Willius J V. "De Semine Animalium" (1677), Willius J V. "De naevus Maternis" (1677), Bartholin T. "Curatio Miraculosa" (1677b), Hannaeus G. "Antipathia singularis, nomen proprium aversantis" (1680), Borrichius O. "Alia imaginantium exempla" (1680).
- 10) This article is also included in Bonet T (1685), in *Observatio XIV*.
- 11) Jacobaeus O (1677), p.97.
- 12) A cleft lips (cheiloschisis) is also reported in "Embryo monstro affinis parisiis dissectus" by Nicolaus Steno. The term *imaginatio* itself is not used, but the mother's desire to eat a rabbit was introduced. Steno N (1673).
- 13) Anzai N (2019).
- 14) Tanigawa points out that the physiological meaning of *imaginatio*, which has persisted since the 16th century, disappears from major medical dictionaries in the 19th century. Tanigawa T (2009).
- 15) Blondel J A (1727).

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## SUMMARY

The effect of *imaginatio* on the body as discussed in Northern Europe's  
first scientific journal

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This study examines how the fields of medicine and natural philosophy perceived the relationship between *imaginatio* and the body in the early modern period. The conclusions are based on articles in the *Acta medica et philosophica Hafniensia* (1673-1680), published in Denmark in 1673, the first scientific journal in Northern Europe, edited by Thomas Bartholin (1616-1680), a well-known Danish anatomist. Of the approximately 600 articles published in the journal, 9 articles that explicitly referred to the presence or absence of effects on the body were included in the analysis for this study.

This study analyzed specific examples in each article to classify their subject matter into deformities, abnormal hair or skin color, birth of a non-disabled child by a disabled person, nevus, disease and treatment, and death. The effects of *imaginatio* on the body were accepted to a certain extent in the late-17th century in Northern European medicine and natural philosophy. In the 17th century, Denmark had been able to obtain medical knowledge and skills from other European. Therefore, the journal's understanding of *imaginatio* and its relationship to the body is not limited to a particular country or region; it reflects the understanding and thought of Europe as a whole.