

On the history of the opening of the ileocecal valve Kaspar Baugin

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The ileocecal valve, or "Bauginian valve," is named after the Swiss scientist Caspar Baugin (1560-1624), who discovered it in 1579. The objective of the study was to reconstruct the chronology of Baugin's discovery of the ileocecal valve and its circumstances. The following works by Caspar Baugin were studied: appendices to the Latin translation of François Rousset's work "L'hysterotomotokie ou enfantement cesarien" (1586), "De corporis humani partibus externis" (1588), "De corporis humani fabrica libri HU" (1590), "Anatomica corporis virilis et muliebris historia"

(1597), "Theatrum anatomicum" (first edition 1605, second edition 1621). The authors note that Baugin discovered the ileocecal valve in 1579, when he was studying at the University of Paris, during one of Thomas Koch's private anatomy lessons (washing the intestines, for which he poured water into it either through the jejunum or through the rectum). For the first time, Baugin described in detail its structure, purpose, as well as the circumstances of its discovery in 1586 in the appendix to his published Latin translation of the work of the French physician François Rousset (1535-1590) "L'hysterotomotokie ou enfantement cesarien." As follows from the second edition of Baugin's work "Theatrum anatomicum" (1621), the existence of the valve was known to the Italian anatomist Costanzo Varolio (1543-1575) before him. However, his observations were published after his death in a work entitled

"Anatomy, or about the resolution of the human body" (1591).

Key words: history of medicine, history of anatomy, eponym, ileocecal valve, Kaspar Baugin, Costanzo Varolio

On the history of Caspar Bauhin's discovery of the ileocecal valve

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The ileocecal valve is also known as Bauhin's valve, after the Swiss scientist Caspar Bauhin (1560-1624), who discovered it in 1579. This paper aims to reconstruct the chronology of Bauhin's discovery of the ileocecal valve and its circumstances, using the following works by him: his appendices to his Latin translation of François Rousset's *L'hysterotomotokie ou enfantement cesarien* (1586), and Bauhin's *De corporis humani partibus externis* (1588), *De corporis humani fabrica: libri III* (1590), *Anatomica corporis virilis et muliebris historia* (1597) and *Theatrum anatomicum* (1st ed. 1605; 2nd ed. 1621).

We note that Bauhin discovered the ileocecal valve in 1579, while studying at the University of Paris, during a private anatomy lesson given by Thomas Koch (while washing some intestines, pouring water into them through the jejunum and the rectum in turn). Bauhin described its structure and purpose, as well as the circumstances of the discovery, for the first time in great detail in 1586 in an appendix to his Latin translation of *L'hysterotomotokie ou enfantement cesarien* by the French physician François Rousset (1535-1590). From the second edition of Bauhin's *Theatrum anatomicum* (1621), we know that prior to him the valve's existence was known to the Italian anatomist Costanzo Varolio (1543-1575).

However, the latter's observations were not published until after his death, in his *Anatomiae, sive de resolutione corporis humani* (1591).

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The eponymous name of the ileocecal valve – “bauhinian valve” – is firmly rooted in the lexicon of anatomists and clinicians. It is known that this anatomical structure was named after the Swiss doctor, anatomist and bot -

nik Kaspar Baugin (1560–1624), who discovered it in 1579 [1–4]. Unfortunately, the available publications [1–4] lack information about the circumstances surrounding this discovery. Only the work of A. Mudry [2] provides a translation into German of a small fragment from Baugin's Latin work “Valvula in intestino colo, anno 1579 a me reperta”, published in the work of I. Spach “Gynaeciorum sive de mulierum tum communibus” in 1597 ., from which it follows that this event occurred during Baugin's studies in Paris, and also

The experiment that resulted in the discovery of the valve is briefly described. A detailed description of the circumstances of the discovery is still unknown to a wide scientific audience

due to the lack of translations of Baugin's anatomical works into European languages. An exception, apparently, can be considered a textbook on anatomy by the British doctor Helkiah Crook (Helkiah Crooke or Crooke).

(1576–1648) “Mikrokosmographia: a description of the body of man” (1615), which is largely a compilation of the English version, compiled from fragments of anatomical treatises known to the author, including those by K. Baugin. However, we were unable to find the information we were interested in in the work of H. Crook.

In this regard, our task was to study the works of Baugin in order to recreate the circumstances of his discovery of the ileocecal valve

Initially, we turned to the main anatomical work of the Swiss scientist “Theatrum anatomicum” (Frankfurt, 1605)¹, believing that it was in this work

This may contain the data you are looking for. In the first book (XVII chapter, p. 121) K. Baugin

wrote²: “If there were a narrowing in the small intestine, then it would constantly suffer from distension. But due to the compression of the abdomen, which is created by its muscles with the assistance of the diaphragm, from the colon into the ileum during excrement, feces and putrefactive winds could flow back (while they are [in fact] transferred from the ileum into the colon),

and thus disrupt the distribution of chyle, and cause vomiting of feces, instead of passing through the lower opening. In the same way, this happens with intestinal volvulus, when the small intestine enters itself more than a finger and, intertwining,

causes such accumulation that food does not descend and is removed not only through colon, but also liquid, foul-smelling feces with vomiting. Therefore, at the beginning of the colon, where it connects with the ileum, there is a valve, as we have explained since 1579 to this day in all our books on anatomy *: it is skin-tight and dense** and faces upward, so

food remains are transported not in a descending manner, but in an ascending manner. This is easy to detect live if you pour water into the intestines through the rectum: it will linger in the colon, and neither the water nor the winds can be driven [further] by force and you will see that the water will not pass through [through the intestines], but you will find

you live it when your bowels have emptied, but already mixed with intestinal contents softened during emptying. Likewise, the composition of enemas, as Galen taught, cannot enter

naturally into the small intestine, although their healing power can spread further. So, Andreas Laurentzius [*André du Laren. – Approx. author*] in his new great work on anatomy describes it in the following words: “At the beginning of the colon we often observe a valve facing downwards and resembling doors, as Baugin elegantly described it (we are grateful for the honor of being mentioned), which prevents the reflux of feces and unnecessary fluid into the upper parts [of the intestine].”^{***} And Archangelus [*Archangelo Piccolo-*

¹ See: https://books.google.ru/books?id=ICXSYJR_U64C&printsec=frontcover&hl=ru#v=onepage&q&f=false.

² Here and here is the translation from the Latin language of the authors.

mini. – *Approx. author*] spoke about three valves in the cecum, which, like in the heart, are directed downwards, the mediation of which prevents anything - whether feces, winds - from

strong compression of the abdomen entered the small intestine. This is demonstrated by water administered as an enema" [5]3 .

From the above fragment it follows that Baugin discovered the valve in 1579.

Having studied his other works, we established that before the publication of "Theatrum anatomicum" he mentioned it in his other works - "De corporis humani partibus externis" (1588, Basel), "De corporis humani fabrica libri IIII" (1590, Basel), "Anatomica corporis virilis et muliebris historia" (1597, Leiden). The earliest mention of the valve by Baugin in a printed publication dates back to 1586, when the scientist published a Latin translation of the work of the Parisian physician François Rousset (1535–1590) "L'hystérotomotokie ou enfantement césarien"⁴

in the appendix to which I posted several of my works, including a short essay with a detailed description of the circumstances

opening of the damper, as well as its structure and meanings.

Baugin wrote: "This happened in 1579, while I was studying in Paris and, among other studies, attended a private anatomical course with my famous compatriot Tom Coccio [*Thomas Koch.* – *Approx. ed.*]: during one autopsy, by the way, I more accurately studied the structure of the intestine, completely separated it from the mesentery and, in order to better examine its fibers and membranes, washed it with water, which I poured first through the jejunum and then through rectum. At the same time, I observed that the water that was poured through the small intestine flowed out of it easily and quickly, and the water poured through the rectum did not pass through the colon even with slight compression of the intestine. By-

to this I decided to investigate what the obstacles were

³ *, **, *** - these designations mark inserts that appeared in the translation of the 1621 edition.

⁴ See: <https://books.google.ru/books?id=eqVb2QcUNHEC&printsec=frontcover&hl=ru#v=onepage&q&f=false>.

danger stood in her way. So I discovered in the large intestine, where the small intestine ends and the appendix is attached to the so-called cecum, that is, at the beginning of the colon, a noticeable valve the size of a large fingernail -

big finger, dense, leathery, etc. I showed it as something new, not yet described anywhere, to my most educated mentor, the famous professor of medicine Guilielmo Capello [*Guillaume Cappel.* – *Approx. author*].

And to date, in our academy, to which I have belonged for eight years now, in at least two public

In the autopsies that I supervised in 1586, I mentioned this valve. After my assistant Dani Pirnusio carried out the colon cleansing, I presented her visualization in a high assembly.

visual inspection, as well as by touch, pouring water through both the upper and lower sections. I measured the length of these intestines (which amounted to 24 of our cubits) and tried to timely

I'm opening them up to inflate them with a bag, but that's not was able to overcome the barrier.

I was in doubt whether this valve would be found in the intestines of animals. That year, namely on July 18, I wrote about this in gratitude to the students of medicine. And five days later I opened the dog and other parts of other animals, as before, publicly, teaching the method of sectioning, and presented to the eyes of those present what I had spoken about before: I discovered the same shutter when opening the dog.

Of the many most learned and educated spectators who were present at the autopsy, Dr. Antonius Boukardus Lotharingus [*Antoine Bokar of Lorraine.* – *Approx. author*], whose research, like herbariums, really appeal to me, took the trouble to wash the dog's intestines, fill it with water both through the upper and lower sections

and turn it over - and I showed everyone that same flap, which, however, did not look like a human flap, but like a ring. This is the opening of the damper and the method of this opening, which in fact took longer -

nom, and I'm not writing this because of her name,

to show off that I am its discoverer, but so that the reader can understand when the shutter was opened and in what way, since I know that to this day some famous men deny it and cannot discover it. As for the function of this valve, I believe that it exists to prevent excrement, transferred from the small intestine to the large intestine, from being thrown

back. People often objected to me that the so-called ileal disease shows the opposite, and thus tried to prove that this valve does not block the entire path. But what needs proof is resolved by autopsy. We do not deny cases of ileal disease. This disease strikes with such force that this valve not only weakens, but can easily be destroyed.

sew, and then the excrement returns to the gatekeeper, which by nature the ring should have prevented. But we are going to talk about this and the like, with God's help, in more detail in our books on anatomy" [6].

The priority of the discovery made by Baugin during his student years [7] was disputed by his contemporaries. To the second edition of "Theatrum anatomicum"⁵

, which was published three years before the author's death in 1621, he made minor adjustments to the text and added his comments in the margins. The changes were as follows: "<...our books on anatomy> (and we reported about this before, if anyone remembers):..."; "<...it is leathery and dense>, circular and ring-shaped..."; "<...in the upper parts [of the intestine]>, therefore Varolus [Costanzo Varolio. – Approx. author] called it the operculum ilei [operculum ilei. – Approx. author], and Piccolominius [Archangelo Piccolomini. – Approx. author] – valves of the cecum (he wrote that there are three of them)" 6.

Of great interest are Baugin's comments, in which he proves that

⁵ See: https://books.google.ru/books?id=_omyy7Z7WcgC

&printsec=frontcover&hl=ru#v=onepage&q&f=false.

⁶ They are marked in the translation of the 1605 edition as *, **

and *** respectively.

dependence of his discovery: "Being

The existence of this valve was denied by some celebrities, including the Leiden anatomist Pauvius [Peter Paav. – Approx. auto]; others believed that it was someone other than me who first discovered it; still others, such as representatives of the famous Paduan school of anatomy Aquapendente [Jerome Fabricius of Aquapendente. – Approx. author] and Placentius [Giulio Casserio. – Approx. author] (let this not cause hostility) - in their anatomical descriptions they used to give me credit for its discovery. Others claim that it was discovered by Andernach [Johann Gunther from Andernach. – Approx. author], but I would like to emphasize that in his publication "Medicine in Dialogues" not a word is said about this. Riolanus [Jean Riolan Jr. – Approx. author] stated that Varolius described it (very briefly) even before the birth of Baugin, and then Salomon Alberti (about them now briefly, then more fully). I confess that I did not know that Varolius had discovered [it]; I will add to this that his works ["Anatomiae, sive de resolutione corporis humani." – Approx. auth.] were provided to me for the first time around 1591 Io. Baptista Cortesio [Giovanni Batista Cortesi. – Approx. author], now a professor of medicine in Palermo (Sicily), who published them, while I had already been studying anatomy for 11 years; and in them I found his description of the damper. But this was not before the birth of Baugin, when he [Varolio] lived in Bologna, when [Baugin] went to Padua to study" [8].

The foregoing indicates that that, having mentioned reading the work of Cos tanzo Varolio, Baugin admitted that he was not the first who became aware of the existence of the ileocecal valve. Mentioned by Baugin, Jean Riolan in his work "Anthropographia" (1608) indicates that

that the discovery of Varolio occurred before the birth of Baugin, that is, before 1560, however does not support this statement in any way. Baugin himself is mistaken, pointing out that Varolio's discovery was made during the period of his (Baugin's) studies in Padua, where he arrived in 1577, because by this time

Varolio was no longer alive (he died in Rome in 1575).

The study allows us to assert that Caspar Bauhin discovered the ileocecal valve in 1579 while studying at the University of Paris.

aunt, attending private anatomy lessons from Thomas Koch. During one of the autopsies, performing intestinal lavage (filled

pumping water through the jejunum and then through the rectum alternately), he discovered an obstacle at the border of the ileum and cecum. For the first time, Bauhin described in detail its structure, purpose, as well as the circumstances of its discovery in 1586 in an appendix to the work of Francois Rousset

"L'hystérotomotokie ou enfantement césarien." The existence of the valve was known to the Italian anatomist Costanzo Varolio before Bauhin, who called this anatomical formation "the tectum of the ileum," but his observations were published after the author's death in a work entitled "Anatomiae, sive de resolutione corporis humani" (1591).

In addition, the available information that at least five anatomists knew about this anatomical formation before Bauhin, in addition to Varolio [7, 9, 10], actualizes the research on reconstruction

tions of the history of the discovery of the ileocecal valve

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