In medical-historical literature it is generally stated that the acceptation of William Harvey's theory on bloodcirculation occurred in the Dutch Republic during the years 1637-1640. In that context the works of René Descartes (1596-1650) and Johan van Beverwijck (1594-1647) are always mentioned as the landmarks for the acceptation outside the universities, while in the academic field the teachings and writings of Johannes Walaeus (1604-1649) are considered to mark the beginning of the defence of the new physiological concept of bloodcirculation.

In this bird-eye view of the early reception I hope to make clear however, that Harvey's theory was already discussed in the Netherlands at the latest in 1633. Three general remarks may precede this survey. Firstly, we have to maintain the distinction between the academic and non-academic area of reception, while especially the universities had their own, predominantly resisting factors in the process of innovation. Secondly, it is noteworthy that the discussion outside the universities is (as we will see) almost fully concentrated in Dordrecht and Rotterdam, while from towns like Amsterdam or The Hague we have no evidence of early discussion of Harvey's theory. Aspects of local history, which certainly could elucidate this fact, must be passed over here. Thirdly, it is a striking fact that also in the early discussions Harvey's theory itself obviously was easily accepted; but the implications for philosophical concepts, as well as for medical theory and practice in general, presented a barrier to public adherance.

In connection with the assertion about the academic reception the wellknown story of the Swedish student Jakob Swab at Leyden may be recalled to mind, who in the spring of 1631 confronted his teachers with Harvey's *De motu cordis*, but who only received the advice to exercise the greatest prudence in correcting old medical theories. From the *Positiones variae medicae*, which Franciscus de le Boë, Sylvius (1614-1672) defended at Leyden University in July 1634, we know that at least the pulmonary circulation of the blood was accepted, as Gubser has pointed out in 1964. After 1634 however there are no tidings from the Leyden University about Harvey's theory till 1640 when Walaeus presented his opinion publicly. In that same year the universities of Utrecht and Groningen followed.

Looking at the situation outside the universities we come across the communication of Paul Marquard Schlegel (1605-1653), who tells us in the account of his journey through Holland between 1631 and 1634 that he could not remember to have met any physician who objected to Harvey's theory. Here the question must be put as to whether Schlegel's statement is supported by other sources.

In the case of the mentioned sources from Descartes and Van Beverwijck, most authors have committed a methodological error by only looking at the date
of publication, neglecting the date at which the writer's ideas were generated and
the subsequent date of the publication itself. Regarding the *Discours de la méthode
of Descartes, to which he added a modification of Harvey's theory as the basis of
his mechanistic physiology, we know that this addition summarizes the *Traité de l'Homme* of 1632. From this treatise as well as from his correspondence, it appears
that already in 1629 Descartes heard about Harvey's theory, but read *De motu cordis* not until 1632, after having formulated the text of the *Traité de l'Homme*.

Concerning Van Beverwijck his biographer Baumann has stated that Van
Beverwijck's book *De calculo renum et vesicae* was already finished in 1634. I
would like to defend the supposition that Van Beverwijck's book, and thus the
passage in it about the circulation of the blood was finished in September 1633.
The eight letters in the appendix of his book are dated between September 1633 and July 1637. In the summer of 1637 Van Beverwijck sent his manuscript to
the press; at the end of 1637 the book was already published as we know from
Van Beverwijck's letter to William Harvey. In the meantime, between 1633 and 1637
Van Beverwijck however published several other books, for instance his *Schat der
Gesondheyst* (1636) and his *Idea Medecina Veterum* (1637), in both of which he offers
a Galenic concept of blood movement. Thus we may conclude that, although Van
Beverwijck certainly was conversant with Harvey's theory in September 1633
privately, and even employed this theory in his description of renal physiology, he
publicly adhered to Galen's system of blood movement till the end of 1637.

In this paper we do not merely want to indicate the importance of the pre­
history of publications in defence of William Harvey by physicians whose names are
familiar in medical history, but also want to introduce into the literature about
the reception of the theory of blood circulation the work of a less known scientist:
Isaac Beeckman (1588-1637). In the history of science the name of Beeckman is well­
known, not only for his early statement of the laws of falling, but also for his
consequent reasoning in atomistic terms, his many inventions, his technological
improvements and for his correspondence with Mersenne, Gassendi and Descartes.
From his diary notes, made during his years in Dordrecht, we may also reconstruct
his ideas about Harvey's theory. From that source we know that in April 1633
Beeckman was still unaware of the circulation of the blood. The first acquaint­
ance with Harvey's theory Beeckman must have made in June 1633 from James
Primerose's *Exercitationes et animadversiones*, several passages in which he
commentated in favour of Harvey. He also proposed a very remarkable experi­
ment to prove Harvey's theory by suggesting the interposition of a T-shaped
glass tube into a vein and then to observe the direction of blood flow either directly
or by throwing particles into the tube. From June onwards Beeckman made a
great number of notes about the consequences of Harvey's theory, both for
physiology in general and for medical practice. The new theory for example
offered Beeckman the final solution of the "attractio hepatis" of food from
the intestine to the liver, which sympathetic force he already refuted from his
mechanistic point of view in 1627. Furthermore, Beeckman was aware of the
significance of the new theory for the working of glands, stating that in the case
of the mammary glands the anatomists should investigate the vascular system of
them and should not seek for a duct between the uterus and the breast. With
regards to pathology Beeckman made extensive notes about the imbalance between
arterial output and venous return. In the venous system he distinguished between
the body veins and portal system on the point of the sucking force of the right
ventricle and its distribution between both systems. In the field of therapy Beeck­
man repeatedly made notes in his diary. So for example he refuted the use of
purgatives because the materia peccans could not reach the intestines by way of the
venae meseraicae and he recommended the use of diuretics and diaphoretics which
work by way of the arterial system. Certainly the most striking passage in Beeck­
man's diary is the proposal for venous infusion, in which he suggests the introduction of medicaments directly into the vein. This note is dated May-June 1634; the first reference in literature to infusion stems from Major and is dated 1664.

It may be clear from this very short excursion into Beeckman's diary that Harvey's theory was intensively discussed at Dordrecht from June 1633 onwards. It is a fair suggestion to relate this date to the time of the writing of Van Beverwijck's *De Calculo*. Between Beeckman and Van Beverwijck there existed an intimate relationship; they both belong to the brilliant scientific community at Dordrecht. In passing I would like to indicate the strong interest of this circle for the work of Daniel Sennert (1572-1637). Against this background it has to be explained why Harvey in his letter to Van Beverwijck speaks so explicitly about Sennert and even uses the peculiar formulation « your own Sennert » (Sennertus vester). Not only Beeckman and Van Beverwijck mentioned Sennert repeatedly in their works, but also other members of the circle at Dordrecht were occupied with Sennert's work, among which I think of the poet-physician Daniel Jonctys (1611-1654), who elaborated Harvey's theory for the optical theory of emanation in a poem from 1639.

Let us now turn to the role of the Rotterdam physicians in the early reception of Harvey's theory. In Rotterdam we find Jacobus de Back (1593-1657) and Zacharias Sylvius (1608-1664) as the main proponents of the new theory of bloodmovement. The former is wellknown for his *Dissertation de Corde* from 1648 which was added to the later editions of Harvey's *De Motu Cordis*. In the preface to his *Dissertatio* De Back tells us that about fifteen years ago he read the book of Harvey for the first time. So once more we find 1633 as the date of becoming acquainted with Harvey's theory. De Back said that it took him so much years to overcome what he describes as the destructed order (« destructum ordinem »). In this work he was assisted by Zacharias Sylvius, known to the English speaking world as Zachariah Wood, the author of the *Prefatio*, in the 1648-edition and English translation (1653) of Harvey's *De motu cordis*. As I have pointed out elsewhere Sylvius, who served as a schoolmaster in the Latin School of Rotterdam, performed a considerable amount of textual clarifications in the 1628-edition of *De motu cordis*, and must have been personally acquainted with Harvey. It may even be possible that Harvey visited both Sylvius and De Back at Christmas 1636, when Harvey, in the company of Lord Arundel, was waiting in the port of Rotterdam in order to return to England.

Finally, the question arises if the early reception in 1633, has any relation with or influence on the reception abroad. I am referring to England and France. As far as I know the reception in France has not yet been studied in more detail. From this account of the reception in Holland one would expect that if a similar study is taken up in France that the correspondence of French scientists, especially of Gassendi and Mersenne, with the representatives of the scientific circle in Dordrecht, would harbour a great deal of new material. As to England I would offer the hypothesis that George Ent (1604-1689) was not only the starting point of mechanistic physiology in England with his *Apologia* of 1640, but he was also a channel for the early mechanistic elaboration of Harvey's theory from the Dutch circle with Beeckman and Descartes to England. Ent attended the Latin School of Rotterdam during the years (1620-1624) that Beeckman was teaching there, he still visited his former teacher at the end of 1627 and certainly remained in contact with Beeckman by correspondence. A comparison between Ent's *Apologia* and Beeckman's *Journal* supports in this hypothesis.

With the foregoing I hope to have contributed some new facts to the fascinating story of the reception of Harvey's ideas, which problem requires however still intensive research of medical historians.
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