

DIE TRANSFUSION DES BLUTES IN PHYSIOLOGISCHER UND MEDICINISCHER BEZIEHUNG

By: Dr LADISLAO VON BELINA-SWIONTKOWSKI (1869)

A TRANSLATION OF PAGES 3 - 18 BY PHIL LEAROYD

'Die transfusion des blutes in physiologischer und medicinischer beziehung' by Ladislao von Belina-Swiontkowski (1840-1890), originally published in 1869 in Heidelberg [by Carl Winter's Universitätsbuchhandlung] can be viewed or downloaded from the following sites:

<https://wellcomecollection.org/works/xyaxdznu>

https://books.google.co.uk/books/about/Die_Transfusion_des_Blutes_in_physiologi.html?id=8w0UxwEACAAJ&redir_esc=y

The first section (pages 3-18) of the book 'Die transfusion des blutes in physiologischer und medicinischer beziehung' [The transfusion of blood in physiological and medical relationships] is titled 'Geschichtlicher entwicklungsgang de transfusionslehre' [Historical development of transfusion theory]

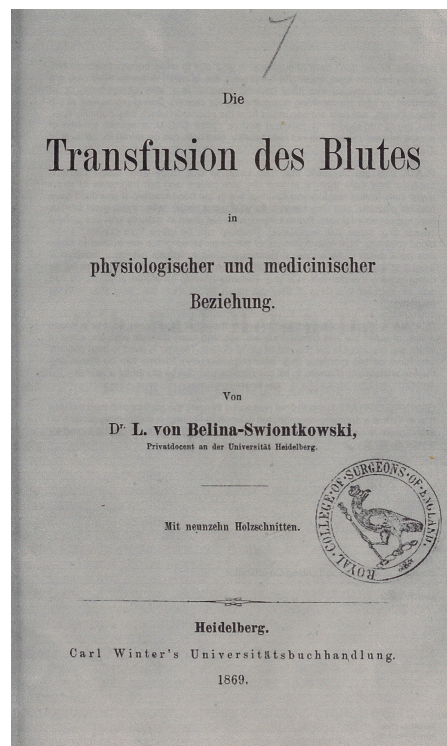
Note: The author's surname has been given various interpretations including Ladislao de Belina and L. Belina-Kwiatkowski; whilst his name appears on the title-page of the book as 'Dr L. von Belina-Swiontkowski'. His work is most frequently referred to in other publications as being by 'Belina. L.'

I have translated the 'historical section' of this important 156-page book on transfusion from the original German into English in the hope that the content may be appreciated by a wider audience. Whilst I am obviously aware that instantaneous computer-generated translation is possible, this process struggles with specialist terminology and also produces a 'colloquial style' not always representative of the original text. I have purposely produced this translation to be as 'un-interpreted' as possible, in that I wanted to maintain the author's original meaning / wording as much as possible. As with any translation the wording may be purposely or inadvertently altered to 'make it read better' but in doing so there has to be an element of personal interpretation involving something on the lines of 'I believe that this is what the author is actually saying'. I wanted to avoid that as much as possible and as such you may find that the English text does not 'flow' as well as it could. Although I have taken great care not to misrepresent the author's original wording I cannot guarantee that this work does not contain 'translational errors' and the reader is recommended to check specific details against the original German text.

I have not changed the spelling of the names of the people identified by the author, their spelling is original. I have though occasionally included explanatory words in square brackets into the text. I have also kept the original wording of the references – they are as written. I have however changed the numbering and location of these, as they are presented in the book at the bottom of each page. I have sequentially renumbered the references and placed them all at the end of the text.

Belina includes in the 'history section' only a brief mention of the possible role of transfusion in antiquity and concentrates on the period after Harvey's discovery of the circulation. Whilst he mentions the work of Lower and King in England he

concentrates more on the transfusions performed by Denis and Emmerez in France, leading up to the transfusion of Antoine Mauroy. The author however, somewhat differently from others of the same period concentrates more on the period after Blundell's experiments around 1820, and in fact includes 'historical' events up to the year of the book's publication. In fact, the book also includes a summary table (pages 28-97) of the details Belina has collected together of 155 blood transfusions performed during the period 1819 to 1868. These are broken down into three categories, i.e. transfusion given for uterine bleeding following childbirth (83 cases), for traumatic and neoplastic bleeding (21 cases) and given for 'blood anomalies' (51 cases). Of these 155 collected cases he states that 75 had a good result, 3 had transitory good results, 5 doubtful and 72 had no effect; in only 2 cases was animal blood used and these were both classed as 'doubtfully successful'.



Title page of 'Die Transfusion des Blutes' by L. von Belina-Swiontkowski (1869)
(Image credit: Wellcome Collection)

HISTORICAL DEVELOPMENT OF TRANSFUSION THEORY

The idea of transferring blood from one person into the vessels of another in order to rejuvenate them seems not to have been entirely unknown even in antiquity.

There is a passage in book VII of Ovid's *Metamorphosis* which most authors believe must refer to transfusion. Medea leads the daughters of Pelia to parricide by promising to make him and Aeson young: "But she spoke the sword, and scoops out the stale blood, that I would fill his veins with youth's blood."¹

French authors mention a failed attempt of the transfusion of blood on Pope Innocence VIII by a Jewish doctor in 1492 and refer to Sismondi. However, this is based on an error of this historian, which arose from a false interpretation of a passage of the annals of Raynaldus. There is only talk of a futile internal application of chemically prepared blood.²

Another note is with Andreas Libavius, who in reported in 1615 about a charlatan whom he does not name, who boasted about an act of rejuvenation by transferring blood through silver tubes from an opened vessel of one person into some vessel of another.³ Colle also mentions the transfusion of the blood in 1628 as an adventurous proposal, which he disapproves of.⁴

When Harvey's discovery of the circulation of blood became known in the same year; many excellent men began to occupy themselves with transfusion and first tried to test it by experiments on animals.

Around 1644 Clarke and Henshaw had made unsuccessful vein-to-vein transfusion attempts on pigeons and Richard Lower on dogs,⁵ the latter succeeded in carrying out the first successful attempt in 1666.

Lower opened the jugular vein to a dog of moderate size, let the blood flow out until it was completely exhausted, and then drained so much blood from the cervical artery of a second larger dog until the first one was completely overfilled. He let new blood out of the vein of the first dog and then again poured arterial blood into it from a third dog. The blood mass of the first dog was therefore almost completely exchanged. Neither was there any harmful consequences noticed after the operation.⁶

This attempt was enthusiastically received, and people were now beginning to see that this procedure could lead to important results and justified the greatest expectations. The Royal Philosophical Society of London devoted the most interest and encouragement to transfusion. It was believed that they had found a means by which one could not only cure diseases, but also rejuvenate people and favourably change their evil passions.

The experiments were very eagerly continued. King (1666) transferred the blood of a sheep into the vein of a dog.⁷ Coxe (1667) let the blood of a mangy dog into the vein of a healthy dog, and was not a little surprised when this did not harm the latter.⁸

Jean Denis and Emmerez (1667) in France, Magnani, (1667), Cassini and Griffoni (1668)⁹ in Italy performed many experiments on animals with favourable success. The latter is even reported to have healed an old dog from its deafness by transfusion lamb's blood.

Denis believed that he could also use transfusion successfully on humans and tried to justify this proposal theoretically. He explained that nature itself teaches us this by feeding the fetus through a type of transfusion that is nothing more than abbreviated food intake. Most doctors agree that the greatest number of diseases involve a corruption of the blood, and that one can therefore improve it by mean of transfusion, and that if the milk and meat of animals strengthens the sick and healthy, he does not understand why animal blood should not be equally beneficial.¹⁰

Denis soon found the opportunity to test his views in practice. A young man between the ages of 15 and 16 had been suffering from a persistent fever for more than two months, during which time doctors had performed 20 blood-letting procedures on him. He was completely anaemic, his mind became dull, his memory

almost completely lost, he was always sleepy, sluggish and almost stupid. Denis believed that he could help with a transfusion and carried it out with Emmerez on June 15, 1667. Emmerez opened an arm vein, let out three ounces of blood, and introduced about nine ounces of blood from the carotid of a lamb through the same opening. Then Denis connected the vein as if after a dissection and let the patient lie down in a bed. The patient assured that during the operation he had felt a great heat up his arm. Five hours after the transfusion he got up, was more cheerful than usual and after a few days his former condition was visibly improved, the mind was much more alert and the body much more active than usual.¹¹

After the successful outcome of this first attempt, Denis undertook a second on a strong 45-year-old litter-bearer, who was easily enticed by money.

Emmerez took ten ounces of blood from him and infused him with the same quantity of arterial lamb's blood. During the transfusion, the man felt a great warmth in the vein from where the blood was entering up to the armpit, otherwise no complaint – he was in a good mood, went to the inn immediately after the operation and on the next day he asked Denis to use him again if he wanted to repeat the operation.¹²

The news of these successful transfusions also aroused the desire in England to try them. An opportunity soon arose when a baccalaureate of theology, Arthur Coga, a good-natured fool of thirty-two, offered to let Dr. Lower attempt a transfusion on him for payment of a guinea.¹³ With the consent of the Royal Society, Lower and King performed the transfusion on the 27 November 1667 in the presence of the Bishop of Salisbury and many learned and noteworthy people. Six or seven ounces were drained from him and ten ounces of arterial blood of a sheep introduced. The blood flowed so freely that one could clearly feel the pulsation of the vein of the arm above the silver tube connected to the artery of the sheep. Coga was not at all affected during or after the operation, the pulse became fuller and stronger and his condition remained good, as he himself reported in a letter written in Latin to the Royal Society. He also requested that the transfusion be repeated on him.¹⁴

On the 12th December of the same year, the transfusion was performed by Lower and King for the second time to Coga. Eight ounces were taken from the patient and infused fourteen ounces of arterial lamb's blood. This experiment also went well and Coga was fine – but his state of mind was not improved.¹⁵

In Italy, around the same time (1667), Riva transfused three patients. Two suffered from intermittent fever and the operation did not have any unfavourable effects on them; the third was the doctor Sinnibaldi, a completely abandoned and almost dying consumptive. No blood flowed from this man's vein and it was hardly possible to get a few drops of blood from him. He died of his condition several months later.¹⁶ In Manfredus too, we also find a description of a human transfusion, albeit a very imperfect one, performed at the beginning of 1668.¹⁷

In Germany in the same year, Kaufmann and Purmann performed this procedure on a person with leprosy and, according to Purmann, the person was cured after three months. They also used transfusion to two Scorbutic soldiers, but it only worsened their condition.¹⁸

Despite the huge attention that these first successful attempts generated, and the favourable mood with which they were received by the great public, there were many opponents, especially in France and Italy, of this treatment, which was associated with the many circumstances, reputations and prestige such an eerie procedure generated. In many writings, a fierce and bitter dispute arose over the advantages and disadvantages of transfusion. It was argued that it is foolish to expect the blood of a calf to be of benefit in the veins of man, but rather to fear the corruption of noble parts of the human body, and it must make man animal-like and stupid.¹⁹

That it was against the doctrines of Hippocrates and even against God's commandment, which in the books of Moses forbids the drinking of blood.²⁰ Claudius Tardi suggested that it was better to use human blood for transfusion,²¹ but this

seemed too cruel using the technique of the time – where only arterial blood could be used. Santinelli declared the operation to be quite unsafe, because he could not determine the quantity of blood transferred.²² Perrault even claimed that no blood at all had flowed over in any of the successful transfusions, that the beneficial effect was only a deception of the surgeons and could only be attributed to the bloodletting used in the process.²³ Martin de la Martinière condemned this procedure as a barbaric one “that came from the school of the devil himself” and that those who carried it out as “true executioners who should be banished to the cannibals and other man-eating nations.”²⁴

Denis believed that the best way to respond to his opponents’ allegations was through new attempts.

Baron Bond, son of the Prime Minister of Sweden, was so seriously ill that the doctors had given up all hope of his recovery. They turned to Denis and Emmerez to try transfusion as a last resort. Denis refused to comply with the doctor’s request, since the patient’s condition did not promise success; however, after many requests and a public statement from four of the patient’s doctors that in their opinion, the transfusion would not kill the patient, since in all probability he only had two hours left to live, Denis and Emmerez decided to carry out the transfusion here as a desperate attempt. The patient, who lay in lethargy with convulsions and an almost imperceptible pulse, was transfused (in July 1667) with two bloodletting basins of arterial calf’s blood; he got a little better, the pulse got a little stronger, the patient regained consciousness and spoke sensibly. After 24 hours the condition worsened again, the transfusion was repeated and the patient came to a little again, but died soon afterwards. The section [post-mortem] found an intussusception of the ileum, and gangrenous destruction of the intestines below this point.²⁵

Another attempt concerned a poor mentally ill person. This man, a valet named Antoine Mauroy, had been insane for eight years and only had occasional moments when he was sane and behaved calmly. His last attack was such that he had to be bound. However, he knew how to free himself from them and almost completely naked, he escaped his guards and in this condition reached Paris, which was twelve miles from where he lived. After hanging around [sic] here for 3-4 months, he was apprehended by the authorities and handed over to Denis, who with Emmerez, performed a transfusion on him on the 19 December 1667. They took 10 ounces from an arm vein and injected him with only 5-6 ounces of arterial calf blood, because the patient said he was fainting. He assured them that during the operation he had also noticed the feeling of heat along the arm, became calmer after the operation and on the next day 2-3 ounces of blood taken from him and at least one pound of calf blood was transfused. His pulse rose, afterwards he experienced a strong sweat and the pulse began to become uneven; the patient complained of pain in the kidney region and nausea to the point of suffocation, then he broke the food he was eating and went to bed, where, after an effort to vomit, he slept soundly until the following morning. When he woke up, he complained of pain and fatigue throughout his body and produced a large glass full of dark urine. The following day, the urine was also almost completely black. He was left with 2-3 small bowls, and he gradually came to his senses, and everyone believed that he was completely cured.²⁶

The great sensation that this favourable case caused gave Denis a new opportunity to perform a transfusion. It was a woman who had suffered a stroke and was paralyzed and numb all over the right half of her body. Denis could only promise a probable relief from the transfusion. In February 1668, he gave her 12 ounces of arterial lamb blood over two occasions. Soon afterwards, the patient regained the use of her tongue, was able to move the paralyzed limbs and began to see just as well with the right eye, which she could use only imperfectly in the past, as with the left. As witnesses of this striking effect, Denis lists many people of repute.²⁷

Meanwhile, the transformed Mauroy gave himself up to drink, his wife enticed him to frequent sexual intercourse, despite the prohibition by the doctors, and when he

fell into a violent fever she also knew how to give him some very suspicious powders. In order to shift any guilt away from herself, she asked Denis he would like to carry out another transfusion, as her husband seemed to have reverted to his previous state. At the beginning of the operation, when the patient was only cut through the skin, he developed severe convulsions, the transfusion was not carried out and Mauroy died soon afterwards. Denis suspected that Mauroy had been poisoned before he was brought to him and asked for the body to be opened. The woman knew how to prevent this and, encouraged and supported by Denis' opponents, she sued Denis saying that he was to blame for her husband death. There was a trail and since his many opponents argued that Denis did not possess a Parisian doctorate, the criminal lieutenant of the Châtelet of Paris brought it to a conclusion by issuing an edict on 17 April 1668, "that from that time forward no transfusion may be carried out unless the doctors of the Paris Faculty have given their consent."²⁸

This judgement brought transfusion into disrepute. In Rome, it had so much influence on the magistrates that in the same year the transfusion of animal blood into humans was forbidden by law.²⁹

In Germany and England too, where people were initially so favourably disposed towards transfusion, people were disappointed by the somewhat excessive expectations. The unfavourable fate of transfusion in France and Italy had discouraged the practice of this healing procedure and here too there was a reluctance to use animal blood. Even the good-natured baccalaureate of theology Coga was nothing less than favourable towards transfusion. The Royal Society requested to transfuse him for the third time – he rejected, using the term "Martyrs of the Royal Society".³⁰

With the imperfect technique and the extremely inadequate medical knowledge of the time, one was far from attributing the unfavourable success of an awkward indication and incorrect practice, and so completely gave up any hope of ever deriving advantage from the transfusion.

From then until the beginning of our century, one hears nothing more about the use of transfusions in humans. It was used only to demonstrate blood circulation and other physiological experiments. At the end of the 18th century, Rosa and Scarpa in Italy and Bichat and Portal in France were particularly interested in this.³¹ These experiments did not produce any significant results, but they gave many excellent men the idea that transfusion could, with more accurate indications and appropriate application, be used for the benefit of medicine. Thus Darwin thought that in the beginning of typhoid fever, with great weakness and very small pulse, where the stomach is completely deprived, repeated transfusion of human or animal blood could be of great benefit.³²

Paul Scheele carefully compiled all the literary material on transfusion and led the history of this doctrine until the end of the 18th century.

The famous Hufeland recommended transfusion in asphyxia as a result of bleeding, in order to irritate the heart and the rest of the vascular system and thus revive the body, and asked doctors to investigate this subject.³³ His son also carried out several experiments on animals and took his father's view.³⁴

However, the difficult and unsafe technique deterred doctors from practicing transfusion. It was only James Blundell who succeeded in making the transfusion practically usable by giving it a more secure physiological basis and inventing a more correct method of execution. Stimulated by the post-partum bleeding of a young woman, he performed numerous experiments on animals and found that human venous blood can be used successfully for transfusion, that the blood retains its invigorating effect even after it is exposed to the air for 25 minutes and that blood can be transferred most appropriately by means of a syringe.³⁵

Not deterred by some unfortunate transfusion attempts, Blundell and Doubleday performed this operation with success on a woman with a newly born child near death in September 1825.³⁶ Together with Uwing³⁷ and Waller³⁸ his transfusion

method succeeded in saving two more women who were bleeding to death following childbirth.

Many objections to transfusion have been raised within the medical and surgical society; nevertheless, further successful transfusions by Doubleday, Waller and many others brought this operation to the fore in England, especially in women who were bleeding to death after giving birth.

In Germany and France, many excellent men paid attention to transfusion and sought to subject it to rigorous scientific examination.

Dumas and Prévost (1821) found that the blood transfused from a different species had toxic effects; the blood of the same species, brought into the bloodstream that is exhausted as a result of bleeding, in some cases produces a complete production. They also discovered that defibrinated blood could be successfully used in the same way as blood containing fibrin.³⁹

In 1824 Tietzel published a dissertation on transfusion.⁴⁰ A few years later, Dieffenbach carried out extensive work as a continuation of Scheel's work – the history of transfusion theory continued until 1828.⁴¹

Marcinkowski tried to establish the indications for transfusion and recommended the same for scurvy and maculosus Werlhofii disease.⁴²

The results published by Bischoff in 1835 and 1838 of his experiments identified the new fact, which is most important for transfusion, that the red blood cells make up the invigorating principle in the blood; they confirmed the assumption of Dumas and Prévost that the function of the blood cells is not altered by beating and therefore defibrinated blood should be used, because it is safe to use and eliminates the risk of the transmission of clots. The blood can be used successfully on the same species, but the toxic effect of blood from a different species occurs only when venous, but not when arterial blood is used. Bischoff suggested that the "animal slags" contained in the venous blood caused the toxic properties.⁴³

In 1845, Dieffenbach announced his unfortunate transfusion attempts in three cholera patients and one hydrophobic, and recommended them only in cases of bleeding and asphyxia.⁴⁴

In 1852, Schiltz performed extensive work on transfusion and raised several objections to the use of defibrinated blood.⁴⁵ In the same year, Giovanni Polli performed two experiments with defibrinated human blood and confirmed Bischoff's view.⁴⁶

The results of his numerous experiments, published by Brown-Séguard in 1855 and 1857, brought an essential enrichment of the theory of transfusion by showing that the effectiveness of the blood used for transfusion depends on the gas content. Venous blood has the same resuscitating power if it is made bright red by the introduction of oxygen, or if the injection is done so slowly that the blood in the lungs can be decarbonised. Conversely, arterial blood has a toxic effect if it is made dark by treating it with carbonic acid; death then occurs with convulsions as a consequence of the deleterious effect of carbonic acid.⁴⁷

In 1859, Martin published his extensive monograph on transfusion in cases of bleeding in newborns and in it defended the use of non-defibrinated blood.⁴⁸ The same point of view was taken by Graily Hewitt in 1863.⁴⁹

In 1860, Nicolas found that the cold delayed coagulation⁵⁰ and Oré stated in 1865 that he had obtained favourable results by injecting blood at a temperature of 0 [degrees].⁵¹

Panum examined the objections to the use of defibrinated blood, confirmed the view of Bischoff and Brown Séguard and found that defibrinated blood possessed the same resuscitating power as fibrin-containing blood and accordingly deserved preference in practice because of the elimination of thrombus formation. Panum came to the conviction that only human blood should be used for transfusion in humans and found beyond doubt that the transfused blood of an animal of the same species completely replaces normal blood and permanently takes over all functions

of metabolism, respiration and nutrition. The blood of a different species can only temporarily invigorate, it soon decays and is excreted from the body in a dissolved state.⁵²

Neudörfer and Demme tried to introduce transfusion into military surgery, and the former also practiced this procedure in vain when exhausted as a result of profuse suppuration.⁵³

In 1864, Kühne published his experiments on the effect of transfusion in carbon dioxide poisoning, according to which he had achieved resuscitation by transfusion even in cases where the respiration movements had been completely interrupted for seven minutes.⁵⁴

In 1866 Badt and Martin were able to save a person poisoned by carbon dioxide gas by transfusion.⁵⁵

In the same year, Mosler applied transfusion to leukaemia with relatively favourable results.⁵⁶

Eulenburg and Landois recently (1866) sought to establish the indications for this operation in a careful study based on physiological experiments.⁵⁷

Over the last 50 years we have found numerous transfusions performed in various countries recorded in the literature. The same were collected by Routh,⁵⁸ Soden,⁵⁹ Martin,⁶⁰ Blasius⁶¹ and Goulard.⁶²

I sought to supplement and complete them wherever possible, and thus put all the cases listed in the literature available to me or taken from private communication in a tabular overview. I attach the transfusions I have carried out and first provide a detailed description of a successful transfusion, which I performed in the maternity clinic in Heidelberg on 23 January 1868, in a patient with severe eclampsia, with the consent of Professor Geh. Rath Lange.

References:

1. Ovid Metam. Lib. VII Verses 333 and 334.
Stringite, ait, gladios, veteremque haurite cruorem
Ut repleam vacuas juvenili sanguine venas.
2. Raynaldus, in seinen Annales ecclesiastici ab anno quo desint etc. usque ad annum 1534, in folio. Col. Agrip. 1692–1733 pars XIX. 1492. p. 412, schreibt: "Laboraverat diutino morbo, a biennio enim, quo torpore soporifero viginti horis sine vitae signis jacuerat, adversa valetudine fuerat usus; acciditque tum, ut cum vis morbi medicam artem eluderet, Judaeus impostor, qui valetudinem pollicebatur, a tribus pueris annorum decem, qui paulo post emortui sunt, sanguinem exhauserit, ut ex eo pharmacum stilla titium chimica arte paratum propinandum Pontifici conficeret: quod cum Innocentius rescivisset execratus nefas Iudaeum jussit facessere, qui mox fuga supplicio se subduxit". - Daraus erdichtete sich Simonde de Sismondi in seiner Histoire des Républiques italiennes du moyen âge, Paris 1815, Tome XI. p. 367 und 368, folgende Erzählung: "Dans sa dernière maladie, le pape Innocent VIII se laissa persuader par un médecin juif de tenter le remède de la transfusion du sang, souvent proposé par des charlatans, mais qu'on n'avait jusqu'alors jamais éprouvé que sur des animaux. Trois jeunes garçons, âgés de 10 ans, furent successivement, moyennant une récompense donnée à leurs parents, soumis à l'appareil qui devait faire passer le sang de leurs veines dans celles du vieillard et le remplacer par le sien. Tous trois moururent dès le commencement de l'opération, probablement par l'introduction de quelques bulles d'air dans leurs veines, et le médecin juif prit la fuite plutôt que de s'essayer sur des nouvelles victimes. Aucun effet ne fut obtenu, le pape mourut le 25 avril 1492".
Note: This translates to: "In his last illness, Pope Innocent VIII allowed himself to be persuaded by a Jewish doctor to attempt the cure of blood transfusion, often proposed by charlatans, but which had until then never been experienced except on. Three young boys, aged 10, were successively, in return for a reward given to their parents, subjected to the apparatus which was to pass the blood from their veins into those of the old man and replace it with his own. All three died from the beginning of the operation, probably

by the introduction of a few air bubbles into their veins, and the Jewish doctor fled rather than trying himself on new victims. No effect was obtained, the Pope died on the 25th. April 1492." - PL

3. Andreae Libavii, appendix necessaria syntagmatis arcanorum chymicorum contra Henning: Scheunemannum Francof. 1615, fol. Cap. IV p. 7. -- Scheele vermuthet in dem Charlatan den Magnus Pegelius, Prof. der Math. zu Rostock. s. Paul Scheele. Die Transfusion des Blutes und Einspritzung der Arzeneien in die Adern; Kopenhagen 1802 und 1803. 2 Bde. in Bd. I, S. 26.
4. Johann Colle, methodus facile parandi tuta et nova medicamenta Venet. 1628. Cap. VII. p. 170.
5. Philosophical Transactions. In the Savoy. 4. 1667. Vol. II. No. 35 and Birch, History of the Royal philos. Society. 4. 1757. Vol. II. p. 67.
6. Rich. Loweri, tractatus de corde; Lond. 1669. 8. p. 141. Philos. Trans. No. 19 und 20. 1666. Vol. 1.
7. Birch, History etc. Vol. II. S. 133.
8. Ebendaself, S. 133 and 134.
9. Giornale de Literati per il Tinassi. 1668. 4. No. 7. p. 91. Rilazione del successo di alcune transfusione del sangue fatte negli animali; also Rilazione del esperienze fatte in Inghilterra, Francia ed Italia intorno la famosa transfusione del sangue per N. A. Tinassi in Roma 1668. 4.
10. Lettre escrite à Mr. Montmor, Conseiller du Roi en ses Conseils, et premier Maistre des Requestes par J. Denis, Professeur de Philosophie et de Mathématique, touchant une nouvelle mani ère de guérir plusieurs maladies, par la transfusion du sang, confirmée par deux expériences faites sur des hommes; Paris le 25 Juin 1667. 4. 18 S.
11. Ebendaself und C. Gadroys, lettre escrite - Mr. l'Abbé Bourdelot, Dr. en Médec. de la faculté de Paris, et premier Médecin de la Reine de Suède, pour servir de réponse au Sr. Lamy et confirmer en mesme temps la transfusion du sang par des nouvelles expériences; Paris le 8 Août 1667. 4. 16 S.
12. Bei Denis 1. c.
13. Birch I. c. c. 4. p. 209 und Oldenburg and King in Boyles. Works. Tom. V. p. 371 and 638.
14. Birch I. c. Vol. II. p. 216. Philos. Trans. Vol. II. No. 30.
15. Birch I. c. Vol. II. p. 227.
16. Georgius Abrahamus Mercklin, de ortu et occasu transf. sanguinis; Norimberg. 1679. 8. Acta Nat. Cur. p. 325, An. I (J. G. Elsner's Mittheilung).
17. Pauli Manfredi, de nova et inaudita chirurgica operatione, sanguinem transfundente ex individuo ad individuum, primum in brutis, dein in homine Romae experta; Romae 1668. 4. 32 S.
18. Mth. Gottf. Purmann, Chirurgia curiosa; Francof. et Lips. 1699. 4. p. 712 auch bei Demselben in chirurgischer Lorbeerkrantz, S. 284, 285.
19. G. Lamy, Maistre aux arts en l'université de Paris, Lettre Mr. Moreau, Dr. en Médec. de la faculté de Paris, Conseiller, Médecin, Lecteur et Professeur ordinaire du Roi, contre les prétendues utilités de la transfusion du sang, pour guérir des maladies, avec la réponse aux raisons et expériences de Mr. Denis; Paris le 8 Juillet 1667. 4. 15 S.
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24. Pierre Martin de la Martinière, opusculs contre les circulateurs et la transfusion du sang; Paris 1668.
25. Bei Denis und C. Gadroys I. c.
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27. Lettre escrite à Mr. Sorbière, Dr. en Médec. par J. Denis, aussi Dr. en Médec. touchant l'origine de la transfusion du sang, et la mani ère de la pratiquer sur les hommes avec le récit d'une cure faite depuis peu sur une personne paralitique; Paris le 2 Mars 1668. 4. 12 S.

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G. Lamy, Lettre à Mr. Moreau, Dr. en Méd. dans laquelle est descrite la mort du fou prétendu guéri par la transfusion, avec un récit exact de ce qui s'est passé aux transfusions qu'on lui a faites, et quelques réflexions sur les accidents, qui lui sont arrivés; Paris le 16 Fevrier 1668. 4. 11 S.
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