

UN MOT SUR LA TRANSFUSION DU SANG

By: Dr. J. DE MUYNCK

A TRANSLATION BY PHIL LEAROYD

A copy of the paper 'A word on blood transfusion' by J. De Muynck, published in the journal *Annales de la Société de Médecine de Gand* (reference vol. 19, pages 106-124) in 1847, can be viewed or downloaded from the following site:

<https://books.google.be/books?vid=GENT900000014319&printsec=frontcover#v=onepage&q&f=false>

Muynck starts by stating that he wishes to examine the history of blood transfusion with a view to 'destroying the routine beliefs' that have limited its development, commenting on the ancient beliefs of the role of blood and the unquestioning effects of Galen's theories. He however describes the idea of transfusion rejuvenating the old and prolonging life to have been mainly supported by "grey haired enthusiasts"!

He credits Libavius with being the first person to describe the idea of blood transfusion and goes on to incorrectly suggest that Edmund King performed a transfusion from one person to another, rather than one animal to another. He also wrongly identifies Arundel House to be a 'hotel' and that Lower and King performed their experiments in front of a 'crowd of patients' rather than the members of the Royal Society.

This somewhat loose use of language and inclusion of incorrect statements is an annoying aspect of the sometimes rambling text in which the author prefers to provide a personal commentary that is unfortunately short on accurate details and is chronologically imprecise. This is exemplified somewhat by the fact that he describes the development of 'infusion', i.e. the injecting of medicinal substances, after he has described blood being transfused instead of identifying that it was transfusion that developed from infusion experiments. His rather sensationalistic text includes such statements as transfusion being associated with 'countless abuses in France' and early transfusions being performed by doctors 'without concern for their fellow human beings'.

The author concludes with an illustrated description of Blundell's Gravitator transfusion device and its use.

I have produced a translation of this paper from the original French into English to hopefully enable its content to be appreciated by a wider audience. Whilst I am obviously aware that instantaneous computer generated translation is available, this process however struggles with accurately reading the original text and interpreting specialist terminology, as well as producing a 'colloquial style' not always representative of the original text. In addition, an 'automatic translation' may either purposely or inadvertently alter the wording to 'make it read better' but in doing so there has to be an element of interpretation involving something on the lines of 'I believe that this is what the author is actually trying to say'. I want to avoid that as much as possible and try to present what the author actually wrote and as a result the reader may find that the English text does not 'flow' as well as it could. Although I have taken great care in accurately identifying the original text and producing a true representative translation of 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 text.

I have reproduced the original paragraph settings and general layout as accurately as possible and maintained within the translation the words that are originally printed in italics

and capital letters. I have also maintained the spelling of the names of people as originally printed – although some of these are incorrect. The original references to the text are included at the bottom of each separate page; I have sequentially re-numbered these and reproduced them as originally written at the end of the translated text. The illustration of Blundell's Gravitator device is placed at the beginning of the original paper (page 106) – I have moved this to the part of the translated text that includes its description and method of use.

A small amount of Latin text is included within the paper. I have attempted to provide an English version of these, contained within square brackets in the translated text. Muynck uses the word 'transfusoire' which translates to 'transfusory' which I have used in my translation.

NOTE: The illustration and description of the Gravitator transfusion device included within this paper was originally published in James Blundell's 1829 paper titled: Observations on transfusion of blood (with a description of his Gravitator) - See: *Lancet*, 12, 302, 321-324.

A WORD ON BLOOD TRANSFUSION

BY: Dr. J. DE MUYNCK

RESIDENT MEMBER (1).

Time wears out error and polishes truth.
OF LEVIS.

The transfusion of blood, at first almost universally adopted as a means of remedying a host of diseases, and afterwards proscribed by the physicians of the Continent as a method dangerous in its effects, is scarcely practiced in our days except in England, where it counts among its advocates the most famous men of that period. Does not this division of opinions, this conflict of feelings, show that, far from being relegated to the class of things judged unfavourably, the practice of blood transfusion is important enough to authorize a new examination? This is how the Medical Society of Ghent judged, by once again drawing the attention of practitioners to this powerful means of stimulation.

In writing these few words on the *Libavian* discovery, I had no other aim than to support, as far as my means permit, the views of a learned assembly which wishes today to draw new light on a question of therapeutic question still surrounded by obscurity.

Before we deal with the usefulness that medicine can derive from the transfusion of blood in certain diseased circumstances, it is important, in order to destroy routine belief and to fix minds on a question which has suffered and still suffers today so many contradictions, to seek the cause of the discredit into which this curative means has fallen, and to penetrate the motives which led the physicians of the continent to bury it, for about two centuries, in the most complete oblivion. To attain this end, it is necessary to cast a rapid glance at the history of this means of excitement par excellence.

Several nations contended for the honour of the discovery of blood transfusion. The English claimed it in favour of CHRISTOPHE WREN, professor of astronomy at the College of Seville, Oxford. The French attributed it to DENIS, a doctor in Paris. STURMIUS (2), a famous mathematician, and VEHRIOUS, a professor at Frankfurt, do credit to MAURICE HOFFMANN for this invention. Others to MAJOR, professor of medicine at Kiel, who, they say, gave the first description of it in his treatise entitled: *Chirurgia infusoria*. Finally, MUYS pretends, and with reason, that ANDRÉ LIBAVIUS, rector of the University of Coburg, in Franconia, is the only one to whom the glory cannot be justly denied. In fact, the following passage in the work of this author, entitled: *Defensio sygmagmatis arcanorum chemicorum*, [Defense of the sigma of the mysteries of chemicals] published at Frankfort in 1615, and consequently long before the publication of the works of the doctors just quoted, leaves no doubt in this respect: "*Adsit, says this author, juvenis, robustus, sanus, sanguine spirituosus plenus: adstet exhaustus viribus, tenuis, macilentus, vix animam trahens. Magister artis habeat tubulos argenteos, inter se congruentes, aperiat arteriam robusti, et tubulum foemineum infingat, jam duos tubulos sibi mutuò applicet, et ex sano sanguis arterialis, calens et spirituosus saliet in ægrotum, imòque vitæ fontem afferet, omnemque languorem pellet.*" ["He is present, young, robust, healthy, full of spirited blood; let the master of the art have silver tubes, matching each other, open the artery of a strong man, and fashion a female tube, then he will apply the two tubes to each other, and from the healthy arterial blood, warm and spirited, will leap into the sick, and immediately bring the fountain of life, and all languor pellet." – PL]

The mother idea of blood transfusion therefore obviously belongs to LIBAVIUS; but his method is dangerous in that he proposes, as we have just seen, to open the artery of the one who supplies the blood and the one who receives it. Thus this discovery was at first treated as absurd and disastrous, and aroused in its author a crowd of enemies who, without examination or reflection, opposed it with sarcasm and ridicule. It was about half a century before the *libavian* invention seriously fixed the attention of the learned. In fact, it was not

until about 1658 that the English doctor WREN took a special interest in it. It was he who advised, in the practice of this operation, the opening of the vein instead of that of the artery, as LIBAVIUS had indicated, and who contributed, in this way, to enriching operative medicine with this new discovery.

WREN's method, advocated by the illustrious ROBERT BOYLE (3), WILKINS and THIMOTHÉE CLERCK, who had made the first attempts at it, was received by the most enlightened doctors of that time with an enthusiasm perhaps without precedent in the splendors of medicine. WREN's transfusory process was the only one followed by all experimenters until 1666, when the celebrated EDMUND KING, who was ardently engaged in the practice of blood transfusion in London, made known a method which seemed to be safer, simpler, and easier. It was done as follows.

One of the veins of the patient's arm or one of those of the hand was opened, and a silver, copper, or ivory pipe was inserted into it, taking care to turn the end towards the heart. The same preparatory operation was performed on the healthy person, but in such a way that the end of the pipe which entered the vein was directed towards the lower part of the vessel; then the smaller tube was introduced into the largest, and as much blood was drawn from the healthy person as it was thought proper to enter the vein of the sick person. This finished, the wound was dressed (4).

The method of EDMUND KING was followed to the exclusion of all others, until the time of ERASMUS DARWIN (5), who proposed to use for this operation a chicken's intestine, the ends of which were provided with silver tubes, about an inch in length, and advised, in order to preserve the heat of the blood, to hold the gut and the two tubes on a basin filled with water at the temperature of 98 degrees of heat (Farh.).

Moreover, the rumor of the experiments instituted by LOWER and KING before a select company and on a crowd of patients assembled for the purpose at Arundel Hotel, in London, spread rapidly not only throughout England, but also in France, Italy, and Germany. In Paris, JEAN DENIS, assisted by a surgeon named EMERIZ, soon tried the operation of transfusion of blood on various patients. JEAN GUILLAUME RIVA tried the same procedure at Rome (6). In Germany, several doctors adopted it with an enthusiasm that is difficult to describe. At last the experiments multiplied, and the world soon resounded with the innumerable prodigies, each more absurd than the last, which were attributed to this new discovery. At that time, people even carried their exaltation so far as to imagine that the practice of blood transfusion was the real means of rejuvenating old men, of prolonging life. Needless to say, it was chiefly the happy of the day, the grey-haired enthusiasts, and the old-fashioned coquettes who shared this ridiculous opinion.

The accredited medical theories and prejudices of science in the 17th century explain the enthusiasm of the doctors of those times for blood transfusion. At that time, peripathetism and Galenism, outraged by the Arabs, still reigned as despots in the field of science; and it is easy to conceive that no doctrine was more likely to promote the progress of transfusory practice than that of GALEN, who attributes the cause of all diseases to the alterations to which the humors are susceptible. When doctors saw everywhere nothing but peccant humors, the number of which, according to certain writers of that century, amounted to about eighty thousand, was it not natural that they should ardently embrace a curative process by which they imagined that they could substitute for old, degenerate, corrupt blood, a young blood of good quality, with which, in a word, they believed they could renew the mass of humors? Let us add that the doctors, by exclusively adopting this new therapeutic means, still flattered the opinion of the multitude, who were also then ridiculously enthusiastic about a practice from which they expected wonders.

The puerile and foolish hopes of that epoch should not, however, surprise us. Does not each century bring its fashion, its faults and its follies? "*In nova fert animus*," ["In the novel it carries the soul"] said the judicious OVID; and do not these words seem to be the motto of the human race? The delirium of blood transfusion was succeeded by chemical innovations, the purgative powder of AILHAUD, the elixir of immortality of CAGLIOSTRO, as well as a host of other so-called specifics which ended with the last century, to be replaced by leeches, the King's medicine and fresh water, which are so many panaceas of the day and

which caprice or fashion will dethrone tomorrow. This kind of medical fluctuation will be perpetual, because the credulity of the vulgar, and even of the vulgar scientist, concerning curative methods and so-called specific ones, advocated by system doctors and brazen charlatans, has been and will forever be that of a child.

But let us return to the subject we have in view. The general enthusiasm for the practice of blood transfusion was such in the 17th century that doctors neglected all other medications in the treatment of diseases, and attached themselves only to what they regarded as a universal panacea. Soon they were no longer limited to passing blood into the veins of the sick man; they were still injecting medicinal substances with a temerity that makes one shudder when one thinks of it. This practice, which was called *infusion*, consisted in opening one of the patient's veins and passing through it, by means of a syringe or a bladder provided with a cannula, the therapeutic agent that was to be used. The method of *infusion*, which, in its turn, was embraced with an enthusiasm that led all minds astray, had but a short duration. Ardent and reckless partisans, by carrying the mania for its application to the point of fury, promptly decried it.

At that time, however, there were found in Germany and Italy, doctors, sincere friends of science, who applied themselves with all the circumspection of wisdom to the practice of infusion, and who endeavoured, after having collected well-established and well-observed facts on this subject, to free it from the empiricism of their time and to bring it back to the path of experience and observation. Among these scientists, we may particularly mention SMITH, SCHEFFELER, and FABRICE, of Danzig, whose interesting experiments on the action on the animal economy of purgative drugs, introduced by the way of the veins, deserves the attention of practitioners. We cannot yet pass over in silence the laborious FRACASSATI, professor of anatomy at Pisa, who also occupied himself a great deal, and especially in theoretical views, with the method of infusion. It was his experiments on this object that led the famous DE BILLS to the discovery of his method of dissecting animals without any bloodshed. But, in spite of the efforts of these enlightened men to combat and destroy the fatal enthusiasm which the practice of infusion had inspired, and to bring about the triumph the principles which experience had suggested to them on this subject, the abuses continued, and the innumerable disasters which were the inevitable result of them, promptly brought about the fall of this new curative process, which become one more scourge for humanity.

In England, the practice of blood transfusion, which had also become, by too general application, a fruitful source of serious accidents, was about to meet the same fate, when the Royal Society of Sciences, London, submitted the question of transfusion to a new examination, and proclaimed, after having tried to discern the truth from the suppositions of enthusiasts, the real principles of the ideas born of a delirious imagination, that recourse to the transfusory method should be had only in a few rare cases where the impotence of the ordinary resources of art was clearly demonstrated. It did more; it condemned to public execration those whom an odious mania would henceforth lead to abuse so energetic a means of stimulation.

This wise and humane conduct had the most fortunate results. Soon the transfusions, under the imposing authority of this learned body, were seen to abandon the path suggested by blind enthusiasm, to follow henceforth only that indicated by experience. From then on they sailed safely on a sea formerly famous for shipwrecks. The transfusion of blood, so to speak regenerated, was naturalized in England, where its progress, though slow, has not ceased to be continuous.

It was not so in France. The transfusory practice was destined for a rapid and irreversible fall. This medical novelty had at first excited, in Paris, according to custom, an exaltation difficult to describe; it was the subject of all conversation; the newspapers, those arbitrary dispensers of the favours of fame, resounded daily with the prodigies attributed to it; finally, the idea of its salutary influence, infallible on all diseases of whatever nature they might be, was general and dominant in the minds of the people (7). But, in France as elsewhere, the innumerable abuses, the frightful accidents which followed them, quickly made his star fade and excited among the doctors, already divided by the spirit of system, a most bitter

polemical war. It is to be regretted that the example set by England has been neglected in this country; no learned society was seen to hasten to stop the enthusiasm and to guide the transfusers who walked at random, without concern for their fellow men, without rules, without principles as without aim.

At that time, French doctors were divided, of no use to science, into two sects: one held to the principles of Galen, and consequently to the practice of transfusion; the other had adopted the doctrine of the medical chemists, which counts PARACELSUS, SENNERT and SYLVIUS DE LE BOE among its founders. It was among the medical chemists that the transfusory method met with its most implacable enemies; and this is not surprising when one thinks that in the idea of this sect, the fall of the practice of WREN was infallibly bound to lead to that of humoral pathology. And what a polemical war broke out between the transfusers and their antagonists! some were *cannibals*, *Jerusalem artichokes*; others, *miscreants*, *scoundrels*; at last the struggle became more poisonous, and the medical-chemical sect, which was afterwards paid, as we know, by the measure of retaliation, was soon seen to employ the most odious means to combat its adversaries. The war which it waged against the transfusers, with unheard-of violence and relentlessness, was particularly directed against DENIS, who was, at that time, the most famous and zealous apostle of the transfusory method. This tactic was clever: the fall of DENIS, whose reputation was brilliant, could lead, in France, to that of transfusion and perhaps even humorism.

It would be superfluous here to give the details of the persecutions to which this renowned transfusion was subjected; we will confine ourselves to saying that, in a host of libels, it was treated by its adversaries, not only as the most shameless of empirics, but also as a poisoner and murderer. It is conceivable that such indictments must have aroused the attention of the magistrates, so the sanctuary of justice was not long in resounding with the complaints raised by the spirit of sect against this zealous partisan of the *libavian* discovery, and the sentence of the Châtelet, to the effect that "*In the future it would no longer be possible to make the transfusion of blood on men, without the approval of the doctors of the Faculty of Paris*" (8), was the denouement of this first cabal.

The decision of the Châtelet could not have been more favourable to the medical-chemical sect. Two systems, as we have seen above, shared the school at that time. Among the members of the Faculty, some, and this was the greater number, had adopted the chemical doctrine, others still held to the principles of GALEN. However, it was to be expected that the members of the Faculty, the majority of who were hostile to the transfusory practice, would never have given such approval. Let us add that the sentence of the Châtelet had wounded the doctors of Montpellier, Rheims, and other universities of France, who, not thinking that they needed the advice of the doctors of Paris to be able to prescribe an operation of this nature, rose up and confederated to shake off the humiliating yoke that centralization wanted to impose on them. In a word, the Paris judgment gave rise to a kind of medical anarchy which the antagonists of transfusion knew how to take advantage of; and in fact, in the midst of the disorder which this judgment imbued with partiality had created in the medical world, the medical-chemical sect again hurled the most horrible and absurd accusations against its adversaries, whom this time it described as disturbers and anarchists; in short, she did everything in her power, moral, religious, and political, to alarm the zeal of the magistrates; and it succeeded, in spite of the wise and brilliant plea of the lawyer De la Moignon in favour of the practice of WREN, to provoke a decree of the parliament, imposing an absolute prohibition, under severe penalties, to indulge henceforth, in France, in the practice of blood transfusion. Pope Clement XI followed the example of France, and the transfusory method, that powerful means which causes much good or much harm according to the hand that implements it, was at the same time proscribed in the Roman States, and consequently in the greater part of Europe (9).

Returning to the history of transfusion which we have just outlined, we see that this curative process has been used in England, at first with temerity, then with wisdom and success; but that elsewhere, by attaching too great an importance to this powerful means of stimulation, by using it as a panacea against all kinds of diseases, we have ended by losing ourselves in a maze of misfortunes and follies. These data prove that the reproaches that

have been leveled at this practice are far from being well founded, but that they belong entirely to those who have adopted it in an exclusive and thoughtless manner, to the enthusiasts, the ignorant, the clumsy who, in spite of experience, in spite of proofs too dearly acquired, have made a cruel abuse of it.

It was therefore not reasonable to deprive doctors of such assistance simply because it had been abused. Instead of proscribing it, should we not have limited ourselves to censuring its abuse? Thus, although the transfusion of blood has been condemned by judges whose incompetence and ineptitude are sufficiently proved by the mere fact that they banished from the field of medicine antimony and its various preparations, which Louis XIV., more enlightened than his parliament, has revived, we are quite inclined to believe that this curative means will one day be received with the belated recognition of doctors and patients.

In the present state of medical science, the diseased circumstances in which blood transfusion can be successfully used are very rare, and are limited, in our opinion, to the following:

In traumatic lipothymia compromising life after the unsuccessful use of ordinary means. (I can speak of it knowingly, having had occasion to see this operation performed successfully in similar circumstances by ASTLEY COOPER, in the presence of DUPUYTREN and some other surgical celebrities of France.) (10)

In violent haemorrhages, especially in those of the uterus, as a means of reviving and prolong the existence close to extinction, and thus of providing the doctor with precious time for the application of remedies suitable to the circumstance.

One could perhaps still derive a great advantage from the transfusory process in asphyxiation by submersion, where bleeding, generally used, is often pernicious, since this situation is included in all cases of lipothymia, failure, and syncope, in which it is recognized that bleeding is fatal. But can it be used, as DARWIN advises, as a suitable means of sustaining individuals suffering from an organic narrowing of the oesophagus or a complete paralysis of the pharynx? Can it still be practiced successfully in the case of certain nervous or typhoid fevers? It is up to experience to decide.

We must remark that the success of blood transfusion, in cases where its use is positively indicated, depends largely on the goodness of the instrument used. The apparatus of the English doctor BLUNDELL, *Blundell's Gravitator*, which obviates all the disadvantages that have been reproached to the transfusory devices proposed in turn, seems to us to deserve all the confidence of the transfuser.

The BLUNDELL device is divided into six parts. And although, after a superficial examination, one may be tempted to find it complicated, it will be seen, by connecting these parts with each other, that this apparent imperfection itself achieves an important advantage, that of not forcing the operator to occupy himself with the mechanical element, and of leaving him all his freedom of mind in a circumstance which requires great intellectual effort.

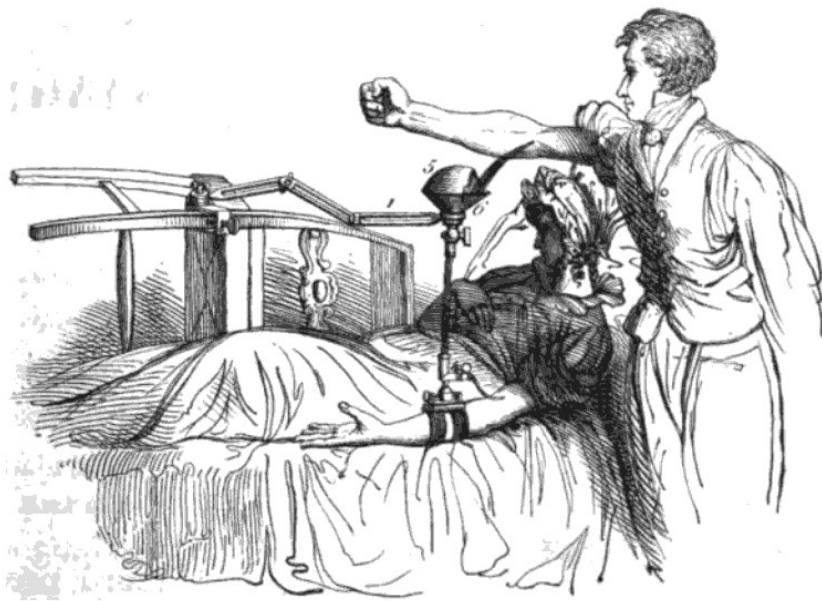
Among the many advantages of this device, one of the most important is that it prevents the introduction of air into the bloodstream with certainty. This advantage does not derive from the perfection of the mechanism of the instrument, but is a necessary result of the principle according to which it works. Another consideration, which is also very important, is that this instrument not only prevents the necessity of withdrawing, during the operation, the small tube introduced into the patient's vein, but that it also protects the blood vessel against any violent shock, and gives the transfusion the greatest facility of adjusting the force of the injection according to the requirements of the case.

The attached plates represent the device. Its various parts are marked with numbers and letters to which the following description is attached.

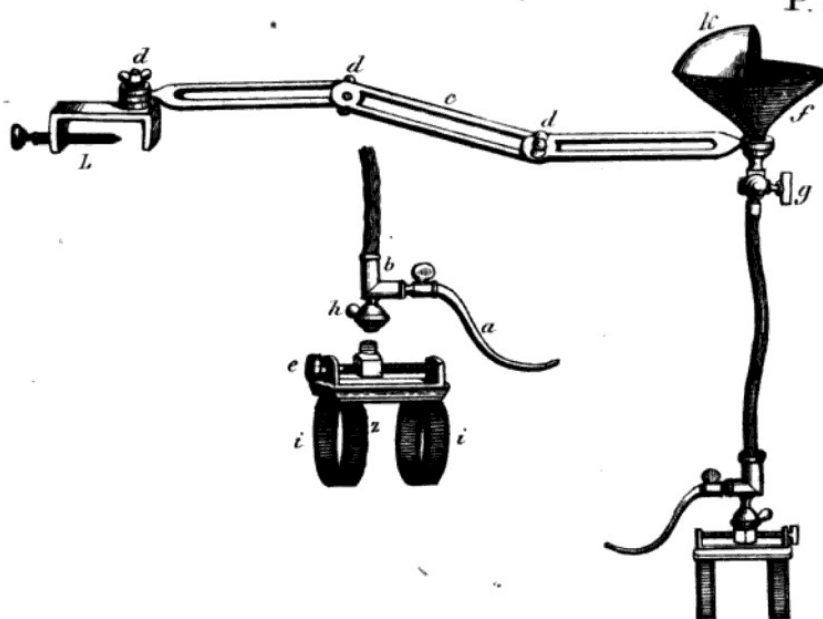
No. 1 is a flexible branch intended to support all the rest of the device (except the spring hook which surrounds the patient's arm): one end of this part of the device is provided with a strong crampon or screw (pl. 2, fig. *l*), so that it can be attached to a chair, which must be placed on the side opposite the arm being operated (see pl. 1). At the other end of this flexible branch is a ring to which the tap is screwed (pl. 2, fig. *g*) which is attached to a flexible cannula, the lower end of which is terminated by a metal tube bent at a right angle (pl. 2, fig. *b*), provided with a ball and a cover serving to connect it to the clamp or bracelet

intended to clasp the patient's arm in the manner indicated in plate 1. This crampon carries a screw with a rifled head which supports a small hemispherical cup to which the cover of the ball mentioned above must be screwed, so as to complete the junction of the ball and the pipe. We must observe that this kind of junction enables the operator to fix the angular end of the cannula at a suitable degree of inclination or obliquity. The venous tube (pl. 1, No. 4) is of a very flexible silver, and consequently capable of being directed in the direction most favourable to the operation. The parts marked 5 and 6 constitute the blood vessel; its lid is arranged in such a way as to prevent blood intended for transfusion from gushing out. We must point out that the bottom of the container is triangular, in order to prevent the rotational movement that liquids sometimes take by passing through an opening arranged in the shape of a funnel.

P. I.



P. II.



When one is about to make use of the device we have just described, one must, says Dr. BLUNDELL, behave in the following manner: "first close the tap (pl. 2, fig. g), and pour into the container (pl. 2, fig. f) an ounce of pure, warm water. Then, the patient's vein is uncovered to a length of half an inch or more, if deemed necessary. Then, after attaching the venous tubule (pl. 2, fig. a) to the angular tube which terminates the flexible cannula, by lowering and adjusting the flexible arm support (pl. 2, fig. c), the device should be arranged so that the end of the venous tube rests externally along the vein for an extent of half an inch. We must add that the venous tubule, being of a pure silver and very flexible, can be modified in its curves so as to be able to be precisely adapted to any accidental variation in the direction of the blood vessel. It is needless to say that the venous tubule must be directed towards the heart, so as to follow exactly the direction of the vein, which should be spared as much as possible during the whole course of the operation.

These preliminary measures taken, the operator should open the patient's vein to a suitable extent, and, while taking pains to prevent the slightest shedding of blood, he should place the clamp or spring bracelet (pl. 2, fig. i) on the patient's arm, to which it must attach so that the silver tubule may be brought into contact with the vein. At the same time, if necessary, he must tightly screw the nuts of the flexible arm support (pl. 2, fig. d) in order to secure the entire device.

After these preparations, the operator, by separating the cover from the cup, must release the joint of the ball and the pipe; and, after having arranged the device on this side in a suitable manner, let it pass and re-pass as gently as possible, with all gentleness, the movable silver tubule, (because it is suspended from the flexible cannula), through the opening of the vein, in order to ascertain, in this manner, whether it really penetrates it. For it sometimes happens that the venous tubule is inadvertently directed between the cellular tissue and the vein, which, as is conceived, causes the whole operation to fail. Then, removing the tubule from the vein again, the transfuser will open the tap so that the water contained in the container descends into the tubes and completely expels the air. Then, the tubes remaining filled with water, he will close the tap again after having definitively introduced the tubule into the opening of the patient's vein; he will open the vessel of the one who is to supply the blood, which is placed in such a way that this liquid can easily fall into the container. All you have to do is turn on the tap of the container again for the transfusion to take place.

By this mode of transfusing the blood, the small quantity of water which is in the tubes naturally enters the patient's vein together with the blood. This circumstance is, it is true, an inconvenience, but so far no observation has shown that it is a real evil.

The blood intended for transfusion must gush frankly into the container; if it flows in sheets, it cannot be suitable for the purpose that is proposed to be achieved.

As the operation continues, the doctor will take care to carefully observe the patient's features: the slightest convulsive movement of the muscles of the face is an indication of the necessity of reducing or slowing down the flow of blood, or even of suspending the operation.

For the duration of the transfusion, only a small amount of blood will be allowed to accumulate in the container. The vital fluid can never rise above the level indicated by the line drawn on the inner wall of the container, which indicates the measurement of two ounces of liquid.

If the blood accumulates too quickly in the container, it is prevented, either by placing the finger below the orifice of the vein that supplies it, or by preventing it from gushing out into the container.

In the sickly circumstances which legitimize the transfusion of blood, it is necessary to avoid, when the heart is struck by a great debility, a too rapid injection of blood. By stimulating the central organ of circulation in this case too abruptly, we would run the risk of arresting its movement and producing sudden death. By partially closing the tap of the container, the force of the blood flow can be reduced at will.

In the current state of our knowledge with respect to the mode of operating the transfusion, it seems to me that the device of DARWIN and that of Dr. BLUNDELL are the

only ones which deserve the serious attention of doctors. However, it seems to me that preference should be given to the BLUNDELL Gravitator, which combines the advantages attributed to that of DARWIN, without having the disadvantages.

If our Society is fortunate enough to be able to throw a faint ray of light on the question of blood transfusion, may it, by awakening the attention of learned bodies, attract others, capable by their whole of shedding light on a point so interesting and so obscure at the same time of practical medicine!

REFERENCES

1. Note lue dans la séance du 9 septembre 1846. [Note read in the session of 9 September 1846.]
2. STURMIUS, *Philosophia eclectic.* diss. X.
3. Voyez *l'Essai sur l'utilité de la philosophie expérimentale*; par R. BOYLE. [See the Essay on the Utility of Experimental Philosophy; by R. BOYLE.]
4. Voyez *Dictionn. univ de Médecine.* Année 1768. [See Dictionn. Univ of Medicine. Year 1768.]
5. DARWIN, *Zoonomie, ou Lois de la Vie organique.* Traduit de l'anglais par notre compatriote feu le professeur KLUYSKENS. [Darwin, Zoonomy, or Laws of Organic Life. Translated from the English by our compatriot the late Professor KLUYSKENS.]
6. Voyez MERKLIN, *De ortu et occasu transf. sang.* Norimberg, 1679. [See MERKLIN, On the rising and setting transf. blood. Norimberg, 1679.]
7. On pratiqua, en France, la transfusion du sang particulièrement sur des aliénés, sans doute d'après le précepte de GALIEN qui prescrit le sang d'ânon pour la folie. [In France, the transfusion of blood was practiced, particularly on the insane, no doubt according to the precept of GALEN who prescribes the blood of a colt for insanity.]
8. Voyez Collection académique; tom. II. [See Academic Collection; Tom. II.]
9. MERKLIN, *De ortu et occasu transf. sang.* Norimberg, 1679. [See MERKLIN, On the rising and setting transf. blood. Norimberg, 1679.]
10. Voyez plus haut l'histoire du chinois, relatée dans le Mémoire de M. SOTTEAU sur la transfusion du sang. [See above the history of the Chinese language, related in the Memoir of M. Sotteau on the transfusion of blood.]