

PROCEEDINGS OF THE SEVENTH CONGRESS OF THE  
INTERNATIONAL SOCIETY OF BLOOD TRANSFUSION



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Edited by  
L. HOLLÄNDER  
Basel, Switzerland



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## Editorial Note

*During the scientific sessions of the 7th Congress of the International Society of Blood Transfusion held in Rome, 3rd to 6th September, 1958, 277 papers were delivered. While most of them are published in extenso in this volume, 54 papers could only be given as abstracts as – despite repeated requests made to the authors – the manuscripts were submitted either too late or not at all.*

*The papers have been read and printed in either of the five official languages of the Congress: English, French, German, Italian and Spanish. In this volume the papers not written in English are followed by English summaries.*

*No substantial alterations have been made in the manuscripts as any attempt at uniformity was considered impracticable. Therefore not all papers include bibliographies and if they do, these again differ from each other: full titles of the listed papers are not always given.*

*Due to the courtesy of the publishers, only few of the numerous tables and figures had to be omitted.*

*According to the programme of the Congress, the papers have been grouped under 16 sub-headings dealing with different aspects of blood transfusion. We hope that by this sub-division the lack of a special subject index will not be too noticeable; an authors' index is to be found at the end of the book.*

*For papers to be published in the Proceeding of future Congresses, the proposals made by Dr. P. L. Mollison, President of the International Society of Blood Transfusion, seem worth considering:*

*Papers which are to last 20 minutes should not exceed 2000 words and include not more than four figures or tables; papers to last 10 minutes should not exceed 1000 words and include only two figures or tables. – For the preparation of manuscripts, bibliographies and illustrations, the publishers S. Karger have compiled some rules which will be supplied to authors and which should be observed by them.*

*Our task in editing these Proceedings has been greatly facilitated by the excellent cooperation of the President of the 7th Congress, Professor P. Introzzi, and the General Secretary, Professor G. Marinone. We gratefully acknowledge their kind help as well as the active support we have been given by the publishers, especially by Dr. H. Karger, the late head of the publishing house.*

*L. Holländer, Basel*



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## **Allocution de Sa Sainteté le Pape Pie XII aux congressistes de la Société Internationale de Transfusion Sanguine**

Le congrès international pour la transfusion du sang, organisé par l'Association internationale de même nom, Nous donne le plaisir de vous recevoir, Messieurs, et de Nous informer de vos activités. A la suite de vos réunions se tiendra le VII<sup>e</sup> Congrès international d'hématologie. Nous n'ignorons pas l'importance accrue, que prennent dans la société contemporaine les problèmes du sang, ni la portée pratique des conclusions et des résolutions, que vous serez amenés à adopter. Aussi sommes-Nous heureux de vous manifester Notre estime et de vous souhaiter une cordiale bienvenue. D'ailleurs la gravité des questions en cause appelle particulièrement Notre attention; l'Eglise ne reste point indifférente, vous le savez, toutes les fois que sont en jeu des problèmes qui engagent la destinée humaine individuelle et sociale, temporelle et éternelle, toutes les fois qu'elle peut, par sa présence ou par une intervention opportune, faire beaucoup de bien ou éviter beaucoup de mal.

L'hématologie – la science du sang et de ses maladies – intéresse au plus haut degré la biologie, la physiologie, la médecine. Le sang, en effet, est en quelque sorte le milieu, où s'opèrent les échanges de la vie organique; il porte à toutes les cellules l'oxygène et les éléments qui assurent leur nutrition, en même temps qu'il assure l'élimination des déchets. Longtemps on le considéra comme intimement lié à la vie elle-même, qui semblait s'écouler avec lui par les plaies ouvertes. Aujourd'hui encore, l'expression «verser son sang» désigne le sacrifice, qu'un homme fait de sa vie pour une cause qu'il croit digne de cette offrande suprême, et qui s'identifie parfois avec les idéals les plus élevés que l'humanité puisse se proposer.

Puisque les participants du prochain Congrès d'hématologie Nous ont prié de traiter certaines questions de morale, qui se posent dans le domaine de la génétique du sang, Nous avons l'intention d'aborder maintenant les aspects généraux de ces problèmes et de préparer ainsi la réponse que Nous leur donnerons. Nous exposerons donc ici quelques aspects biologiques de la génétique du sang et les problèmes qu'elle soulève.

### *I. – Quelques aspects médico-biologiques de la génétique du sang*

Nous avons eu déjà l'occasion de parler du mécanisme de l'hérédité dans Notre Allocution du 7 septembre 1953 au premier Symposium international de

génétique médicale (*Discorsi e Radiomessaggi*, vol. 15 pag. 253 e segg.), et d'énoncer alors les importants principes, qui s'appliquaient aux données scientifiques de la génétique dans leur interférence avec les questions morales et religieuses. Toutefois, pour éclairer Nos développements ultérieurs, Nous devons mentionner encore quelques acquisitions récentes, dont vous avez bien voulu Nous informer.

On sait assez généralement à l'heure actuelle que les globules rouges du sang possèdent des caractères propres et que l'humanité se divise en quatre groupes sanguins: A, B, O et AB. Si l'on appelle «antigène» la capacité de provoquer dans un organisme la formation de substances dites «anticorps», susceptibles de s'unir à l'antigène et de déterminer d'abord l'agglutination, puis la destruction des globules rouges, on peut expliquer l'existence des quatre groupes de la manière suivante: les groupes A et B possèdent chacun un antigène propre, mais non l'anticorps qui y répond, tandis qu'ils possèdent l'anticorps de l'antigène qu'ils n'ont pas; le groupe AB possède les deux antigènes, mais aucun anticorps du système; le groupe O ne possède aucun antigène, mais bien les deux anticorps. Pendant ces dernières décades, la découverte d'autres systèmes a introduit une complexité considérable dans la détermination exacte des types de sang humain. Mais ce qui Nous intéresse davantage, c'est la découverte du facteur «Rhesus», qui permet d'éclaircir la pathogénèse de la maladie hémolytique du nouveau-né, restée jusqu'alors d'origine inconnue. Une mère possédant le «Rh négatif» produira des anticorps pour les globules «Rh positifs», et si l'enfant qu'elle porte en elle est «Rh positif», elle lui causera du dommage. Puisque les groupes sanguins s'héritent suivant le mécanisme de l'hérédité conforme pour l'essentiel aux lois de Mendel, il est évident que pour avoir un fils «Rh positif», la mère devra avoir un époux «Rh positif»; si celui-ci est le fils de parents, dont l'un est «Rh positif», et l'autre «Rh négatif», il aura une probabilité de 50 % d'avoir des fils «Rh positifs»; mais si les parents sont tous deux «Rh positifs», tous ses fils le seront aussi. Quand une femme «Rh négatif» épouse un homme «Rh positif», elle se trouve dans ce qu'on appelle la «situation Rh» et en danger potentiel d'avoir des enfants malades.

A côté de l'hérédité morbide, on peut également considérer celle, dont les résultats sont positifs. Mais comme la médecine s'occupe principalement des conséquences nuisibles, on comprend que l'on ait pu croire et affirmer la prédominance de celles-ci. En réalité les exemples ne manquent pas de familles richement douées, où se transmettent d'une génération à l'autre de remarquables qualités physiques et psychiques.

Qu'il Nous soit permis de signaler encore un cas particulier, à cause de l'importance qu'il revêt dans les régions méditerranéennes. Il s'agit de deux maladies, qui se présentent sous deux aspects cliniques profondément différents, mais qui sont caractérisées par des altérations semblables de système sanguin. La première frappe certaines zones de la population italienne, toute la population grecque et toutes les zones du bassin méditerranéen, où la colonisation phénicienne a laissé des traces. Un enfant naît, apparemment normal, mais le médecin distingue déjà en lui les stigmates du mal, qui le conduira à la mort plus ou moins rapidement, et d'habitude avant la dixième année. Son développement sera notablement ralenti,

son teint pâle; l'abdomen toujours plus proéminent dénote un grossissement énorme de la rate, qui l'occupe souvent presque en entier. La thérapeutique la plus attentive ne pourra que prolonger une vie de malaises et de souffrances; malgré de nombreuses transfusions de sang, qui représentent pour les familles une charge très coûteuse, l'issue fatale sera inévitable.

Au moment où *Cooley et Lee* réussissaient à diagnostiquer exactement cette maladie chez des descendants d'italiens immigrés en Amérique, *Rietti, Greppi e Micheli* en Italie, décrivaient une maladie apparemment toute différente. Chez des adultes menant une vie relativement normale se présentaient des symptômes que l'on interpréta comme une diminution de la durée de vie des globules rouges. Ceux-ci portaient aussi des altérations morphologiques, de caractère congénital, affectant leur forme et leur structure intime, ainsi que l'hémoglobine qu'ils contiennent. Ces formes cliniques de la maladie sont aujourd'hui considérées comme des variétés d'un groupe qu'on appelle «désordre hématologique méditerranéen». Des chercheurs américains, italiens et grecs ont démontré que les altérations de la maladie grave et mortelle des enfants, telle que *Cooley* l'avait décrite, ressemblaient à celles de la maladie de *Rietti, Greppi e Micheli* et des formes qui s'en rapprochent. On en vint alors à la conclusion que les enfants malades avaient été engendrés par deux porteurs du mal hématologique méditerranéen. Ce qu'il faut souligner ici c'est que des individus, qui se croient parfaitement sains, peuvent par leur union provoquer la tragédie familiale que l'on devine.

## II. – Problèmes de la génétique du sang

Les situations douloureuses que Nous avons décrites et d'autres analogues que l'on rencontre dans le domaine de la génétique du sang, méritaient un effort particulier pour résoudre des problèmes d'ordre physique et moral, particulièrement graves. Nous en exposerons quelques-uns, d'après les informations que vous Nous avez fournies, ainsi que les remèdes qu'on a tenté d'y apporter, en considérant les implications morales qu'ils comportent. D'une manière générale, il faut souligner d'abord la nécessité de fournir au public les informations indispensables sur le sang et son hérédité, afin de permettre aux individus et aux familles de se mettre en garde contre de terribles accidents. Dans ce but, on peut organiser, à la manière du «Dight Institute» américain, des services d'information et de consultation, que les fiancés et les époux interrogeraient en toute confiance sur les questions de l'hérédité, afin de mieux assurer le bonheur et la sécurité de leur union. Ces services ne donneraient pas seulement des informations, mais aideraient les intéressés à appliquer les remèdes efficaces. Dans un ouvrage qui, Nous assure-t-on, fait autorité en la matière (*Sheldon C. Reed, Counseling in Medical Genetics*), Nous avons pu lire que la formation principale de la consultation est de faire comprendre aux intéressés les problèmes de génétique, qui se présentent dans leurs familles (*ibid.* III, pag. 12). Dans presque tous les foyers, semble-t-il, on rencontre des situations difficiles, concernant l'hérédité d'un ou de plusieurs de leurs membres. Il peut arriver même que le mari et la femme s'accusent réciproquement d'une

anomalie, qui s'est manifestée chez leur enfant. Souvent le spécialiste consulté peut intervenir avec succès pour atténuer la difficulté. Avertis du danger et de sa portée, les parents prendront alors une décision qui sera «eugénique» ou «dysgénique» à l'égard du caractère héréditaire considéré. S'ils décident de ne plus avoir d'enfants, leur décision est «eugénique», c'est-à-dire qu'ils ne propageront plus le gène défectueux, en engendrant soit des enfants malades, soit des porteurs normaux. Si, comme il arrive d'habitude, les probabilités d'engendrer un enfant porteur de ce défaut sont moindres qu'ils ne le craignent, il se peut qu'ils décident d'accepter d'autres enfants. Cette décision est «dysgénique», parce qu'ils propageront le gène défectueux au lieu d'arrêter sa diffusion. En définitive, l'effet de la consultation génétique est d'encourager les parents à avoir plus d'enfants qu'ils n'en auraient eu sans elle, puisque les probabilités d'avoir un cas malheureux sont inférieures à ce qu'ils pensaient. Si la consultation peut sembler «dysgénique» à l'égard du gène anormal, il faut considérer que les personnes, suffisamment préoccupées de l'avenir pour demander conseil, ont une haute conception de leurs devoirs de parents; au point de vue moral il serait souhaitable que ces cas se multiplient.

On demande fréquemment au «Dight Institute», s'il existe des relations entre la consultation et les devoirs religieux du consultant (*ibid.* pag. 15-16). En réalité la consultation génétique fait abstraction des principes religieux. Elle ne répond pas aux parents qui demandent s'ils doivent avoir encore des enfants, et leur abandonne la responsabilité de la décision. L'Institut Dight n'est donc pas une clinique destinée à réprimer la fécondité; on n'y fournit pas d'informations sur la manière de «planifier» les familles, car cette question ne rentre pas dans ses objectifs.

L'ouvrage, auquel Nous empruntons ces indications, souligne avec force et netteté l'importance du travail qui reste à accomplir en ce domaine: «La mort, dit-il, est le prix de l'ignorance de la génétique des groupes sanguins.» Heureusement, le médecin dispose actuellement de connaissances suffisantes pour aider les hommes à réaliser plus sûrement le désir – si intime et si puissant chez bon nombre d'entre eux – d'avoir une famille heureuse d'enfants bien portants! Si le couple est stérile, le médecin tentera de lui assurer la fécondité; il le mettra en garde contre des dangers qu'il ne soupçonne pas; il l'aidera à engendrer des enfants normaux et bien constitués.

Mieux avertis des problèmes posés par la génétique et de la gravité de certaines maladies héréditaires, les hommes d'aujourd'hui ont, plus que par le passé, le devoir de tenir compte de ces acquisitions pour éviter eux-mêmes et éviter à d'autres de nombreuses difficultés physiques et morales. Ils doivent être attentifs à tout ce qui pourrait causer à leur descendance des dommages durables et l'entraîner dans une suite interminable de misères. Rappelons à ce propos que la communauté de sang entre les personnes, soit dans les familles, soit dans les collectivités, impose certains devoirs. Bien que les éléments formels de toute communauté humaine soient d'ordre psychologique et moral, la descendance en forme la base matérielle qu'il faut respecter et ne point endommager.

Ce que Nous disons de l'hérédité, pourrait s'appliquer en un sens large aux communautés que constituent les races humaines. Mais le danger vient davantage ici d'une insistance exagérée sur le sens et la valeur du facteur racial. On ne sait que trop, hélas! à quels excès peuvent conduire l'orgueil de la race et les haines raciales; l'église s'y est toujours opposée avec énergie, qu'il s'agisse de tentatives de génocide, ou des pratiques inspirées par ce qu'on appelle le «colour-bar». Elle désapprouve aussi toute expérience de génétique, qui ferait bon marché de la nature spirituelle de l'homme et le traiterait à l'égal de n'importe quel représentant d'une espèce animale.

Nous vous souhaitons, Messieurs, de poursuivre avec succès des travaux si utiles à la communauté humaine. Aux enseignements pratiques de ce Congrès s'ajoutera une conscience plus vive de l'aide efficace, que vous apportez à tant de malades. Vous puiserez dans cette conviction plus d'ardeur à vous acquitter des tâches quotidiennes et la certitude d'avoir mérité l'estime et la reconnaissance de ceux qui vous devront d'avoir conservé la vie et la santé.

En gage des faveurs divines, que Nous appelons sur vous, Nous vous accordons à vous-mêmes, à vos familles, à tous ceux qui vous sont chers, Notre Bénédiction Apostolique.



# Inaugural Speech

By P. Introzzi, Pavia, Italy

*Your Excellencies, Honourable Senators and Deputies, Ladies and Gentlemen, Dear Colleagues,*

*In September 1956, during the VIth Congress of the International Society of Blood Transfusion at Boston, the General Assembly, following the proposal of their President, Prof. Ravdin, decided to hold the VIIth Congress at Rome and furthermore to entrust me with the organization. Although I knew I was bound to meet a great deal of trouble and difficulties, I was happy to accept the honour. This honour, and the hard work that has gone into the preparations for the Congress which we inaugurate here today has been shared with my collaborators (and I would like to mention them here – Marinone, Ninni, Ferrata, Liotta, Ceppellini, De Nicola, and many others). These people have given unstintingly of themselves and worked loyally with me for the final success.*

*In this solemn inaugural ceremony our thoughts go respectfully and with devotion to the Head of the State, the Honourable Giovanni Gronchi, who was kind enough to request that the Congress should be under his Patronage.*

*My most profound thanks are also due to those authorities who have formed the Committee of Honour: to His Eminence Clemente Micara, Cardinal Vicario, to the Ministers, to the Senators, to the Deputies, and to the personalities and authorities who, with their presence and the prestige of their names, give to this ceremony a particular solemnity and to us, the organizers, they give the thought that perhaps our long struggle has not been without fruit and that we may hope that our endeavours will be crowned with success.*

*I would also like to mention the Mayor of Rome who was kind enough to give us this magnificent hall here in the Capitol. All about us we can see and take comfort from the perennial heirloom of our history.*

*The organization of an International Congress is not easy, and it would in fact have been impossible without the help of many agencies both private and of the State.*

*I would like now publicly to thank those who have contributed to the realization of this meeting including, as it does, experts from all over the world. It would not have been possible without the aid of the Government, thanks to the interest shown by Senators and Deputies, both doctors and laymen, in particular Senator Prof. Samek Lodovici, Hon. Prof. Ferrieri, Senator Avv. Zelioli, Senator Prof. Ettore Tibaldi, Vice-President of the Senate who reminds me of the distant years we passed together at the Institute of Pathological Anatomy of the University of Pavia: these people I want to thank both personally and on behalf of the Organizing Committee, for their most competent assistance.*

*But the success of a Congress depends also on the number and value of its participants.*

*Today we are outstandingly fortunate: all those gathered together here, with their relative studies in the science and art of transfusion throughout the world, represent the intellectual elite of 43 countries.*

*The United States of America are represented by a whole army of experts, headed by Ravidin, Crosby, Diamond, Levine, Tullis and Strumia; the USSR has sent some of her best in the persons of Professors Bagdasarov, Feodorov and Vinograd-Finkel; Japan is represented by Professors Fukuda, Kato, Tomoda, Hihashi, Yokoyama and Miyamoto; Canada is represented by Harris, Afaganis, Lowenstein, etc.; Argentina by Pagniez, Paulowski, etc.; Brazil by Nussenzweig, Mellone, etc.; Peru by Muñoz-Baratta; Venezuela by Layrisse, and the Philippines by Atienza; Cuba by Chediak; Mexico by Gonzalez-Guzman; Australia by Jacobovicz, etc.*

*Just as these and many other countries from the most distant parts of the world, all the European states have sent their most highly qualified representatives.*

*France, officially represented by the Director General of Health, Dr. Aujaleu, is accompanied by many eminent members of the International Society of Blood Transfusion, under the lead of his untiring Secretary-General, Dr. Julliard; and with him have come well-known experts such as Prof. G. Marchal and Prof. P. Cazal, and a multitude of renowned researchers from Soulier to Eyquem, from Maupin to Bonnel, and others.*

*Switzerland is well represented by Koller, Fischer, Hässig, Holländer, etc.*

*Great Britain by Maycock, Race, Mollison, Morgan, Mourant and many others.*

*Ireland by O'Riordan; Denmark by Henningsen, Friedenreich, etc.; Poland by Panasewicz; Germany by Clauberg, Dahr, Springer, etc.; Spain by Guasch; Portugal by Lessa, etc., Sweden by Broman, etc.; Norway by Hartmann; Hungary by Kiss, Lukács, etc.; Rumania by Nicolau, Gingold, etc.; Greece by Caminopetros; Czechoslovakia by Hrubiško; Israel by Gurevitch; Jugoslavia by Lah, Polak, etc.; the Netherlands by van Loghem and others.*

*This is to mention but a few amongst the multitude here today; I would ask pardon of those colleagues whose names time does not permit me to mention.*

*To all of you then, gathered from the four corners of the world here in the Eternal City, we extend our most cordial welcome and thanks. We hope that your stay in Rome – the City of the Caesars and of the Popes – surrounded by monuments of a glorious past which frequently had a decisive influence on the development of civilization, will leave you with the conviction that this Italy, in spite of the destruction and loss of many of its spiritual and material riches, has been able to withstand with strength and dignity the many misfortunes, mostly unmerited, which have dogged it. We hope you will see how we have found the strength to follow the long hard road to reconstruction and the conquest of truth.*

*When we consider the dignity and position of the many who have acted as Patrons for this Congress, of the many who have helped it, of the many gathered here today to support and honour us, of the many scientists who take an active and creative part, we feel that a large part of this benevolence is dedicated to the Science of Medicine: the most human of the sciences if I may say so, the most closely linked to the destiny of man. The most exacting in its search for truth and the good of man, and I feel that no small part of this is involved in the subject of our researches. The Emblem of the Congress reproduces a magnificent example of Ancient Greek sculpture of the school of Pergamo, "The Dying Gaul", which with extreme vividness and*



*pathetic drama, depicts or rather mourns the fast vanishing life, the horror of the blood slowly flowing from the open wound in the chest. But this mourning and this horror are today overcome by the donors of blood for a humanitarian cause.*

*It is the second time that Rome is the centre for a reunion and meeting of the students and researchers of the problems of transfusion.*

*In 1935, on this same glorious Capitoline Hill, there was held the First Congress of the International Society of Blood Transfusion, presided over by that great scientist and researcher, Leone Lattes, linked to us by an old friendship through community of ideas and work and known throughout the world not solely in his field of legal medicine, but also in many fields of biology and especially in the field of blood-groups where his progress will always remain outstanding. This man, trained under Cesare Lombroso in the study of the most complex problems of criminal anthropology, one of the truly great men in forensic medicine, symbol of culture and of the strength of Italian science, is at this meeting of the International Society of Blood Transfusion, 23 years later, very much in our thoughts. The Society carried forward by him evokes in us all a reverend memory of the man and his work.*

*It is the seventh time that we meet, and the second time that we meet in Rome – the Eternal City. In clinics and laboratories work is suspended, many of you have flown across the skies of the most distant continents and traversed the oceans to bring here the fruit of your laborious scrutiny of the laws of nature and the secrets of science. We are all aware that the first duty of the scientist is the conquest of knowledge and the possession of truth; our second duty, indissolubly linked to the first, is to ensure that the communal patrimony of scientific knowledge is used to the advantage of the community. Nothing and nobody can live as a single egoistic unit. Nothing is good, true or beautiful in its own right but only when it multiplies itself throughout the whole of life, only when it is diffused, only when it transmits itself. That is the very life blood of science! That is the divine and human substance of the soul. And so we meet! In this rich exchange, participation and communication of the treasures accumulated during the long vigils of our researches, with faint clues, fruitless enquiries, mistakes and errors, trying and trying again: until, when we finally achieve our purpose, we have only that which we can give to our fellow scientists. That is why we meet! Finally to see each other's faces, hear each other's words, and the direct expression of our thoughts, but with only one heart, beating together in each and every one of us!*

*It is certain that blood transfusion is the product of a sentiment which is both emotional and rational at the same time, based on the desire to nourish the organism of a patient with the precious vital liquid from a healthy person. No other therapy has, in fact, been so tenaciously followed as the use of blood as a means of effecting a cure. Since time immemorial, perhaps since man has been on earth, the conviction appears that blood, vital element par excellence, animator of the body, was the abode of the soul and had certain magic and occult properties. The ancient considered it a seal to inviolable pacts, righter of wrongs, renewer of life, and healer of all ills.*

*So we see that with the passing of time the introduction of new blood into an organism has always been an engrossing problem.*

*But what errors, what dramas, how many useless attempts have come from the need to solve this problem, which was the mainspring that for many centuries drove on the pioneers of transfusion!*

*From the drinking of blood as a tonic, known in remote history, mentioned in the writing of Aristotle, Lucretius Caro and Pliny, to the bathing in blood, we come to the introduction by means of a hypodermic syringe and finally to a true transfusion, directly from and into the blood stream.*

*The first suggestion of practical transfusion is found in some early Italian writing, as also the first attempts at a true transfusion were made in Italy, which, in this field, as in many other branches of the sciences, the arts and human thought has been a forerunner of the discoveries made later by other richer countries with greater opportunities. From the "Life of Gerolamo Savonarola" by Villari, we learn that in 1492 the first transfusion in "articulo mortis" was given to Pope Innocent VIII; the Milanese doctor Gerolamo Cardano, in 1550, wrote as follows:*

*"Sunt qui cum alio iuvene bonorum morum duplici fistula, alii unica, commutare sanguinem posse sperent: quod si fiat commutabuntur etiam mores."*

*With the later discovery, in 1569, of the circulation of the blood by the Italian Andrea Cialpino and a few years later by the Englishman Harvey, the transfusion of blood could be more easily attempted, based on knowledge which was no longer empirical and uncertain but scientific and exact.*

*From this moment there were many attempts in various parts of Europe to insert blood taken from an organism (either human or animal) into the circulation of another organism.*

*Amongst those who should be remembered in Italy and abroad for their interest in the practical side, the doctor and naturalist Francesco Folli di Poppi (Arezzo) should be mentioned. In 1664, when he designed and produced an ingenious instrument consisting of a raven's feather or a needle of gold or silver, a funnel and a flexible tube made out of the intestine of an animal, he clearly saw the method by which blood transfusion is today carried out with perfected modern equipment.*

*In reality, however, the epoch of practical, clinical blood transfusion did not begin until the discovery of the blood groups: only then did we begin to learn to recognize the first traces of the individual physiognomy of blood, and only then could we begin to initiate a rational method of transfusion, which is today, as in the past, an insertion of living tissue into a second living tissue, governed by the complex and delicate laws which for centuries have been comprehended only as the basic inner life force. When the first basic biological requirements necessary to make the practical transfusion of blood feasible were understood, there was a vigorous flowering of methods and technicalities aimed at rendering the act of transfusion as simple as possible; direct and indirect transfusion, transfusion in toto rendered incoagulable by a wide variety of systems, transfusion of fresh blood, transfusion of stored blood, transfusion of blood from a living person and of blood taken from a corpse.*

*What attempts were made in the years from 1930 until 1940, which one can consider the heroic years in the story of blood transfusion when the methods and the possibilities of the act of transfusion were outlined and defined! The last great war was a strong incentive to the solution of the old problem of the collection of blood from large quantities of people, storing it in glass, and distributing it to large groups of individuals. This problem, which was tragically urgent in the First World War, was not really solved when the first transfusionists in ignorance of blood groups saw their patients die after the hasty transfusion of incompatible blood. That*

*particular problem was resolved in the interval between the wars. The Second World War, however, posed the problem of mass collection of blood, its storage and subsequent supply to the groups operating at the front line.*

*Today the organization of Blood Banks, penetrating as it does into the most remote and desolate villages, always on hand to aid the wounded and the sick, is like a miraculous network, ready for an emergency to become overnight the true bloodstream of a nation.*

*The years following the Second World War showed clearly that the problems of transfusion were not solely those of collection, organization, distribution technique and storage of the precious liquid.*

*A physio-pathological analysis, both biological and clinical of the various, in fact the profusion of individual factors in blood was clear evidence of the importance and the physio-pathological role of each one. Extremely valuable biological research has shown the possibility of breaking down the plasma in order to obtain, isolated and pure, the various factors, and to preserve them by means of lyophilization, to isolate and conserve and keep vital the erythrocytes, the leucocytes, the platelets, etc.*

*Today blood transfusion has, as they say, caught up with itself; apart from being an essential and indeed often vital and accepted therapeutic procedure, even though all its inherent problems are not as yet solved, it has developed its own body of doctrine. To work with a liquid of extreme complexity and delicacy, which has never been artificially reproduced or substituted, and because the introduction of this liquid, either complete or in part "in vivo", has become a true biological experiment as it promotes the reactions of organs which are different by nature, heredity and innate surroundings. In other words, when we today discuss transfusion in reality we touch on an enormous mass of problems, some in part resolved, many still to be solved. In fact, today the problem of transfusion is a long way from the simple technique of the transfer of blood from a healthy individual to a sick individual; instead it implies the solution of an enormous number of biological, clinical, genetical and immunological problems, as well as a number of technical problems, problems of social organization and legal medicine.*

*Although still young, the science of transfusion is full of activity and conscious of its function and of its importance, having now the means and the energy to enable it to develop securely and creatively in the future.*

*This then is one of the reasons why our Society, faithful mirror of the development and evolution of the science of transfusion, with the passing of the years has continually organized Congresses of Haematology specifically applied to the study of the biology of blood in relation to transfusion. Furthermore we have kept in close contact with the ideas and work of the haematologists.*

*Do not think that I want to attribute too much to blood transfusion, but, apart from the fact that there is no clinical haematologist who would not turn to blood transfusion in all or nearly all blood diseases, I would state that the basis of transfusion today is to be found in our biology, chemistry and physiology, and furthermore that a transfusion of blood cannot be made by anyone who is not perfectly aware of the delicate biological, genetical and immunal mechanisms which regulate and indeed are a part of our haematic patrimony.*

*Today the knowledge and ability of a transfusionist must be equal to that of the most highly skilled haematologist.*

*In fact I will go further! Those of you who have followed in recent years developments*

*in the fields of biology, bio-physiology, genetics, immunology, immuno-genetics, anthropology, endocrinology, both clinical and therapeutical, will be aware that transfusion has been a precious means of permitting us to search for, and to resolve, problems which until recently could either not be answered or were not even recognized as problems.*

*Around the first, original and fundamental problem of the act of transfusion have appeared a number of extremely interesting problems in biological and social medicine: it is indeed to transfusion that we owe the studies made in the distribution of blood-groups in different ethnic groups, in different countries, in different continents, in sickness and in health.*

*To transfusion we owe the modern research techniques which promise to produce revolutionary results in the study of the relationship between blood-groups and sickness.*

*To transfusion we owe the practical demonstration of the fundamental importance of certain researches which haematologists had begun some years ago rather as an abstract study than consciously as a research. I am referring of course to the life-span of the erythrocytes, the leucocytes and the platelets.*

*Finally, no one would deny that the studies in transfusion have been the origin of a new branch of haematology: immuno-haematology, which has its own place in our Congress. With regard to this I would also mention the discovery of the incomplete antibodies and the subsequent discovery, or rather re-discovery, of the reactions to anti-human globulin serum; here we should mention Moreschi and Coombs, inasmuch as the Italian Moreschi had already in 1907 clearly described the phenomenon which was subsequently so brilliantly utilized by Coombs.*

*We owe to this new technique, through the antibodies, the recognition of the haemolytic anaemias. Further, the conception of the auto-antibodies extends far beyond the limits of the erythrocytes, to include the leucocytes, the platelets and various other tissues of the blood.*

*It is also to transfusion that we owe our knowledge of the phenomena of isoimmunization, derived from the fundamental discovery of the Rh system and of the haemolytic disease of Rh antibodies; discoveries which opened a new chapter in the study of maternal-fetal parabiosis, a chapter which reminds one of the number of lives saved in cases of fetal erythroblastosis, which were treated in time with an exsanguine transfusion.*

*Also, in the sector of non-applied biology, transfusion has made its great contribution: it is enough to mention that a large part of human genetics, or at any rate that part of human genetics which is most solidly proven, consists of the now countless systems of erythrocytal antigens, the study of which has produced models which are now classics in the field of general genetics, for example the Rh locus complex or the interaction of the successive metabolic steps in the synthesis of the macromolecules which make up the so-called specific-group substances, that will be amply discussed in a later section of our Congress.*

*The concept, then, of the individuality of blood, already stated by Lattes in 1922, has now been given a solid experimental basis with the immunological and genetical data regarding the erythrocytal antigens.*

*And finally the transfusion of blood has evolved the idea of the transplantation of bone-marrow, a practice which has now moved from experimental to the field of human pathology, with special techniques such as the massive Roentgen irradiation of the bone-marrow before transplantation (Dameshek); it could be most valuable therapeutically even in grave cases of haemopathy, up to now considered lethal, as for instance the leukaemias, the myeloid aplasias, various bone-marrow diseases (Cooley's disease, etc.).*

*In conclusion I would like to say that when one considers objectively the results which the studies in the wide field of transfusion have already yielded and promise to yield in the future, both in the applied technical field and in the field of speculative biology, we can be proud of our achievements.*

*But how many other contributions transfusion has made to biology, how many problems are seen in a new light with the technique of transfusion, and also because we are simultaneously offered a road towards the solution of these same problems! How much remains to be discovered, for instance, about blood-groups, about the erythropoietic actions of sera (a particular study of my own clinic and students), of the antibody-like action of the plasma, of the importance of the properdinic system, etc.*

*How much can be clearly seen and learned from this same pathogenesis of a series of autoaggressive diseases! Perhaps the immunological study of the transplantation of bone-marrow is the forerunner of a not too distant day when it may be possible to transplant other organs and tissues?*

*These are only a few amongst the most pressing biological problems which the transfusionist is perhaps in a position to tackle and solve with a more immediate comprehension than the general haematologist, mainly because these are urgent day-to-day problems for him; the driving force behind him, the basis of his work and of his knowledge.*

*In conclusion one fact becomes clear and convincing, although perhaps it is not always sufficiently appreciated: that blood transfusion and the researches which are and will be derived from it have largely contributed, and will continue to contribute to the progress of certain basic sectors of biology and medicine.*

*Such is the necessity to solve the problems which I have mentioned that one can well understand why many schools, both Italian and foreign, initiate their researches in this field; and why there exist many institutes specially equipped for this work, as for example the National Transfusion Centre here in Rome, and the Scientific Section of AVIS in Milan; and also why people have been moved to form, in the name of humanity, associations of blood donors. And finally one understands why experts and scientists have organized national and, later on, an international society which all periodically hold Congresses, Meetings and Symposia.*

*The International Society of Blood Transfusion which today, here in Rome, inaugurates its VIIth Congress, must face these problems of the most fundamental importance.*

*In almost all the subjects which will be discussed there predominates the concept of blood and its high biological qualities as being impossible to substitute.*

*Today modern medicine has shown that there was a basis of truth in the ancient legends which in popular medicine and religious rites attributed to blood magic and occult properties.*

*Blood, with its morphological and chemical components, with its biophysical and biochemical properties, is truly the focus of life in all living organisms. It is the vehicle which carries to the organs the material extracted from nourishment, which absorbs the oxygen from the lungs, which removes the residue of cellular metabolism, which carries the chemical substances, the hormones, the ferments, the minerals, the vitamins indispensable to the life of the organism. It maintains the temperature of the body and defends it against bacterial infection. Everything which is known about the complex construction of blood explains scientifically the ancient concept of the healing properties of nature. It was Hippocrates who indeed believed blood to be better than all doctors and all medicines. In fact, what more convincing demonstration*

could be given for the force of nature, which in a philosophical context comes near to the Divine Power itself!

*Let us consider what happens to the organisms attacked by infection: the natural mechanisms of immunity, the appearance of specific and unspecific antibodies, consider the change which takes place in the blood of these organisms; in other terms, the therapeutical virtues of the blood and of the blood sera, which already in the last century were being brilliantly utilized with the diffusion of sero-therapy.*

*Even the phrase "the voice of the blood" often appears a rhetorical and sometimes even downright theatrical exaggeration; but today we can give this phrase a definite scientific, a precise significance; and if in popular legends, heroic poems, in the tragedies of world literature we always come back to this mystic quality of blood, which rebels against injustice, revenges injuries and maintains the rights of its descendants, the scientific investigators of today cannot but be astonished at the secrets which their laboratory researches reveal, the biological links which run from one individual to another and throughout the whole of the human species.*

*Today in examining the blood of an individual one can make the most incredible deductions: the discoveries of the blood-groups, the ABO systems, and those of the Rh erythrocytal antigenes, MNS, have shown how the blood of each individual has its own characteristics and its own individuality. They show, in certain circumstances, how an individual belongs to a certain family or ethnic group: how the blood modifies its own constitution through the generations in order to fit its surroundings. With blood traces legal medicine can determine and identify the individual from whom it comes. And finally "the voice of the blood" speaks to determine recognition or exclusion in paternity cases.*

*We see then the revival of the thousand-year-old myth, now on a solid scientific basis, of blood testifying for man.*

*We see revealed by science, continually searching out the secrets of life, biological links which seem to form a substratum to life itself.*

*Naturally and above all we have the supreme virtue of human blood in that it can renew and bring back life to the empty arteries of a dying body, and so bring about the great miracle of re-animation. After the mystery of the blood the mystery of the resurrection! There are countless people snatched from the jaws of death by means of a transfusion of blood, and many also who in sickness have been greatly ameliorated by it. Today no branch of practical medicine is in a position to do without transfusion: internists, haematologists, paediatricians, surgeons, obstetricians, dermatologists, all know the definite advantages which can be obtained from this method of therapy.*

*It is not necessary here to underline the dramatic and insupplantably effective merits of blood transfusion in many fields of medicine and surgery: I would remind you that not a few of the most brilliantly successful operational techniques, for example in pneumo-cardio-vascular surgery, were only made possible thanks to massive transfusions and extracorporeal circulation.*

*But before I close this inaugural speech of mine I would like to turn for a moment to the blood-donor and honour his gesture, one of the most inspiring demonstrations of the solidarity and the brotherhood of mankind. Donating one's own blood is giving a part of oneself to the suffering and the sick, irrespective of whether it is done voluntarily or for money. This, the vital liquid par excellence, impossible to manufacture artificially, this complex of substances and energy, man's heritage from the beginning to the end of his life.*

*The act of the blood-donor, which I feel is the highest possible manifestation of human fellowship and charity, appears to me to pass from the strictly therapeutical to the social, from the social to the moral and from the moral to become a religious gesture.*

*It is in the religious history of the nations that we find that blood so frequently represents the classical expression of the relationship between the gods and man. Even though in many countries at various times this was infantile, not infrequently cruel and often even criminal, degeneration and even outright misunderstanding of the problem does not conceal the fact that blood is inescapably linked with religion.*

*It was for Christianity to purify and elevate the religious consciousness of humanity: Christianity bedewed with blood, the blood of Jesus Christ which He gave on the Cross and continues to give for the redemption of humanity, through the ministry of His Church, till every religious being is elevated, revitalized and ennobled.*

*The highest development of civilization known in all history, Christian civilization, flowers at the foot of the Cross, sanctified by the blood of Jesus Christ Himself.*

*So we can proclaim that Jesus Christ, first citizen of the world, is too the first blood-donor.*

*And if, on the religious plane, the Apostle of the Gentiles affirmed: "Without a flowing of blood we cannot make peace with God" (Hebrew 8-22), on the materialistic plane and on the plane of the conquests thus far made by science we assert that without blood transfusion the very existence of man in many respects is seriously threatened.*

*This is not to diminish or even to try and diminish the magnificent and insuperable figure of Christ. Rather would I elevate the station of man, who in his generous offering of his life's blood ennobles both himself and his gift, as he is moved by the impulse of the great laws of Christ Himself, and the inexhaustible richness of His Church: the law of love, the law of fraternity among all the peoples of the earth.*

*So, with the hope that the well-being both spiritual and material of our humanity, which is already sounding its voice in the infinitely distant reaches of cosmic space, will soon be joined by the brotherhood and union of mankind, not only in the field of science, of which this Congress of ours is such a clear example, but in every other field of human activity, I open the Seventh Congress of the International Society of Blood Transfusion.*





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