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THE VOLUNTARY BLOOD DONOR

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The therapeutic applications of blood have undergone a remarkable expansion since the second world war, and the realisation that it is one of the key elements in promoting and supporting many advances in acute and preventative medical care, has highlighted the crucial importance of the blood donor and focussed world wide attention on the systems by which they are recruited and used.

In ancient times blood was regarded as the seat of the vital functions, synonymous with life itself. It was highly regarded as a remedy for its mystical and physical properties, and administered orally in the hope that the more desirable of these qualities would be transferred to recipients. The fact that 'bleeding' survived until comparatively recent times as the mainstay of medical practice and is now gaining a new and spectacular status is perhaps not without relevance.

This feeling towards blood transfusion and blood donation is still a significant deterrent to both donors and recipients among some races, religions and cultures, and the inborn fear that one loses something more precious than life itself with the loss of even a small amount of blood, or acquires some highly undesirable ingredient from a donor of unknown origin, is understandable and has by no means been lost even in the most sophisticated societies. These sort of problems led Samuel Pepys (1666) to comment ..... "this did give rise to many pretty wishes, as of the blood of a Quaker to be let into an Archbishop; but may if it takes be of mighty use to man's health, for the mending of bad blood by borrowing from a better body."

The therapeutic and scientific application of blood transfusion began soon after Harvey's publication on the circulatory system in 1628. However, the disasters which followed early attempts using heterologous blood delayed progress for some 300 years. Nevertheless progress was not to be denied and those reading the account of an exsanguination transfusion described in the Diary of Samuel Pepys, 14th November 1666 will appreciate that the clinicians and scientists of that age were no more lacking in

ideas or the will to prosecute them, than they are today. More realistic progress came in the early part of the 19th Century when Blundell successfully treated haemorrhagic shock with human blood. This development removed the haemolytic and immunologic effects of heterologous transfusion and, although episodes still occurred, the clinical results were sufficiently encouraging to justify perseverance in extreme situations. The next important landmark was the publication of the observation by Karl Landsteiner in 1901 which led to the classification of the ABO blood group system and revealed the cause of the majority of the haemolytic episodes which still followed the administration of human blood. In due course more blood group systems were identified, notably the Rhesus system (Landsteiner and Weiner, 1940), and the importance of cross-matching blood (in vitro) prior to transfusion, was clearly recognised. The introduction of sodium citrate in 1914 as a nontoxic anticoagulant by Agote in Buenos Aires, Hustin in Brussels and Lewisohn in New York overcame some of the technical difficulties of direct transfusion. The addition of dextrose to the anticoagulant by Rous and Turner in 1916 greatly reduced the rate of haemolysis and lent support to the concept of storing blood, although it was almost a quarter of a century before this important observation was fully applied. More recent developments have shown that red cells preserved at subzero temperatures can be stored for several years and this has added a further new dimension to blood banking.

In 1918 Captain Gordon P. Ward commented in a letter published in the British Medical Journal that plasma could be removed from the red cells and used to resuscitate shocked soldiers, and the red cells given to other patients. This observation must represent the first recorded development in the concept of blood component therapy, which did not begin to materialise until in 1940 Edwin J. Cohn, working in Harvard, was invited by the American Government to produce a stable volume expander from human plasma. His subsequent work produced not only a number of important

therapeutic products but laid the foundations upon which component therapy has been based and continues to develop today.

There is no doubt that War has proved to be a consistent and creative stimulus in the field of blood transfusion. The Spanish Civil War, which provided the setting for so many martial experiments, also produced a unique opportunity to examine new techniques for blood storage, transport and administration. World War II stimulated the development of plasma fractionation and the freeze-drying of pooled plasma. At the same time it became evident that, whereas the early attempts to develop voluntary blood donor panels had resulted in only limited success (Fig. 1), the overwhelming national unity which emerged during the Second World War broke the crucially important 'fear barrier', perhaps erected by Walker in 1875 when he wrote of the desirability of waging war backed by a Blood Transfusion Service made up of 'a volunteer reserve of civilians willing to sacrifice their lives for the sake of their fellows'. Thus by the end of World War II the local donor panels had increased substantially, and with this had been created formalised national and/or regional organisations which in some countries were based upon a strong voluntary blood donor system. This development provided much of the foundation upon which the major advances in surgery were built during the 1950's and 1960's, for these required a further substantial increase in the need for blood. The magnitude of this explosion, and the response of a typical local voluntary blood donor organisation serving a population of 1.25 million in the United Kingdom is illustrated in Fig. 2. The nature of the most recent trends has been one less concerned with maintaining the rate of expansion of donor efforts but rather the introduction of technical developments designed to serve the needs of blood component therapy: a concept which when fully expressed seeks to maximise the use of blood donations, provide new and unique therapeutic tools and reduce some of the potential hazards of whole blood transfusions. However, even these developments have

involved the blood donor in increased commitments: the 'on-call' demands for labile products such as platelets and the greater demands of time associated with the introduction of plasmapheresis.

It should be stressed that in many countries some or all of these extraordinarily heavy demands have either been met by non-voluntary donor sources and/or the purchase of blood products from pharmaceutical concerns. However, the heightened potential hazards of transmitting viral hepatitis from blood and blood products derived from some commercial sources and spiralling costs, have lead many governments to examine more closely their Blood Transfusion Services and have induced them to move towards a full voluntary donor system. Two important examples of this trend are the United States and Japan. It is interesting to note that these significant moves, away from professional donor systems, have been made against a background of controversy, largely generated by social scientists in the United Kingdom, in which one authority has insisted that a voluntary donor system is a prerequisite for success (Titmuss, 1970), whereas the other has sought to emphasise that the demands of modern medicine are now so great that they can no longer be met without a professional element (Cooper and Culyer, 1968).

Although it is certain that Professor Richard Titmuss' concept, that the act of voluntary blood donation is part of an inner psychological drive expressing itself as a 'gift relationship' was somewhat over-simplified and limited in perspective, there is no doubt that blood donation is a relatively unique phenomenon in our society and one which is intensely personal. Such conclusions, in addition to the overwhelming evidence supporting its crucial importance to modern medical care, must mean that those responsible for the operation of this service should recognise the serious nature of their contribution and above all appreciate that the 'gift' they have received must be held in trust for others, and that 'this morning's' blood donor may be 'this afternoon's' recipient. Moreover, if

a Blood Transfusion Service operates within a Health Service in which patients are not limited in their access to drugs such as penicillin or digoxin, then the staff of the Blood Transfusion Services must seek all possible ways to bring their community Blood Banks on a par, in terms of availability of blood and blood products, with the Hospital Pharmacy. Thus an appreciation of the nature of the act of voluntary blood donation leads to considerations, often with strong moral overtones, of careful planning, defining the needs of a community, exercising authority on the use of blood and blood products and maintaining close contacts with the community from which the donors emerge.

These aspects of the voluntary donor system cannot be reviewed at the present time on an international or even national basis, for the level of performance, as judged by such parameters as the number of donations obtained per unit of population, vary for a variety of reasons, between countries and regions within one country. Nevertheless, it seems reasonable to conclude that with the gradual introduction of full-scale blood component therapy, new demands on blood input will inevitably be made and thus the number of donations per unit of population will be one important and useful marker of a successful donor system. The shortage of information on the way obviously successful voluntary Community Blood Banks are managed is such that it is not possible to derive clear objective guidelines, and it is necessary for the author to draw from his own experience, as a former Director of a completely voluntary Community Blood Transfusion Service, serving a population of 1.25 million which had, during his tenure of office since 1947, secured massive increases in demand and reached a donation input of over 50,000 per million of population per annum (see Fig. 2).

Reflecting on these years of ever increasing demands, and assuming that these have been successfully met, there seems to have been a series of pointers which have blended together to make these achievements possible.

These can be summarised briefly as follows :-

Definition of the Nature of the Need.

There is no doubt that at the present time in the United Kingdom, and in many other developed countries, there is a shortfall in the supply of blood and more particularly blood components such as albumin and coagulation factors. It has, on more than one occasion, been concluded that this is an inevitable consequence of total reliance on a voluntary blood donor system and to meet the demands of modern medicine will require, at the very least, a significant degree of supplementation from commercial sources and/or professional donors. It is the author's opinion that those inadequacies which exist in modern developed countries are entirely the fault of the organisation of the Service and not the selfishness of ordinary members of the community.

One of the important features of a successful voluntary blood donor system is forward planning. Above all, this begins by careful calculations of the community's requirements of the different products now available. Occasionally, with some of the more recently introduced products, these will be approximations, often based on figures from other parts of the world, but it is essential that estimates are made, targets fixed and programmes developed. Too often either no targets are set and a Service wanders aimlessly through peaks and troughs of supply, or at worst there has been a paradoxical over-protection of the donor and his donation, which has manifest itself in the 'positive restraint approach', which starts from the premise that many blood transfusions are unnecessary and the best way to reduce the risk to unsuspecting patients and counter serious wastage is to limit supplies. These attitudes inevitably filter back to those members of staff directly involved with the voluntary donor and the lack of enthusiasm and direction will have its expected negative results. In any event this approach is manifestly outmoded, for although none would support the uncritical use of blood or blood products, the amounts of

plasma fractions, such as coagulation factor VIII and more particularly albumin, that are now required, coupled with the current fractionation yields, must lead to a substantial increase in donations along with an expected red cell wastage of as high as 30%. The restrictions on the use of blood and blood products must be controlled by education of physicians and surgeons and clinical training and involvement in the care of patients by the medical staff in the Blood Bank. The voluntary donor must be made to feel that if he or she becomes a patient then access to all aspects of blood transfusion will not be limited by planned or unplanned restrictive practices of the administrative and/or medical professions. Such a concept is potentially a sharp area of contrast between voluntary and professional donor systems, and such a policy demands long-term planning which is frequently subject to revision. The success of these exercises will depend upon medically qualified staff of the Blood Transfusion Service who spend much of their time involved in the clinical management of patients requiring transfusion, but who are also frequently reaquainted with the grass-roots of blood donor sessions and who take time to educate and encourage those responsible for recruitment and holding the enthusiasm of voluntary donors.

A further important aspect of a voluntary blood donor system is the need for <u>good communications</u>. The staff at all levels must see that their primary task is to forge a unique link between the sick and healthy from the same community. Efforts must be made to see that staff, perhaps primarily concerned with the cross-matching and issuing of blood and blood products, have some contact with blood donors as people. The medical staff must maintain close working contact with all clinicians in the community and be involved in nursing, undergraduate and post-graduate medical education. In this way the clinical needs are clearly seen and felt and in due course are suitably transmitted to other members of staff and on to the blood donor. In order to obtain this quality of

communication consideration may have to be given to the optimal size (population) served by a voluntary Community Blood Transfusion Service. Where local press, radio and television are available full advantage must be taken to educate, recruit, encourage and maintain the interest of blood donors. Close communication at all levels of staff between different Blood Transfusion Services is also important and cost-effective travel should be actively encouraged, for new ideas are often generated and frequently fertilised by outside contact.

Blood Donor Organisation.

Blood donation, as with organ or tissue donation, is an intensely personal affair and in terms of human relationships there are relatively wide variations, not only between individual nations, races and cultures, but also significant differences between relatively small communities. These subtle community differences must be recognised by those responsible for donor recruitment and management and while this does not invalidate a centralised coordinating administrative structure the organisation must, above all, be flexible and insist upon a considerable degree of delegated operational responsibility. It is the author's opinion that without this principle the steady week to week, year by year donation input from a community will be maintained with increasing difficulty as donors become relatively isolated from the Service and their absence at Bleeding Sessions is not noticed, or worse still notification is communicated by a computer.

Most successful political parties and voluntary organisations will readily agree that their success stems from eliciting support and action at the 'grass-roots' and that this is best achieved by the formation of 'cells'; small groups of people with a clear message which they strongly support and whose task is to communicate and recruit within their own locality. The message and tasks of a voluntary Blood Transfusion Service are especially suited to this approach, with powerful emotional overtones

and the added rider that when suitably educated in the functions of such a service there are significant potential self-interest motives. Nevertheless, successful recruitment cannot be expected - aside from sudden community or national disaster situations - by a central organisation using exclusively the press, radio and television, for the really important recruit is the regular blood donor. Thus the successful Voluntary Services are likely to be those in which the individualism of each 'cell' is recognised and encouraged by the Central organisation and members of the 'cell' are left to clothe the emotional and functional overtones in the way that they see will fit their own locality. From this concept has emerged the Honorary (Voluntary) Blood Donor Organiser whose small team of volunteers recruit donors and also plays a major role in the local Blood Withdrawal Sessions. In this way the Voluntary Blood Transfusion Service recognises the subtle differences in attitudes and methods of communication between communities in multi-storey apartments, workers in offices and factories, miners, farming and fishing communities and suburban residential areas.

Some might argue that this approach in their particular community would not work unless there was some form of reward for both Honorary Organiser and Blood Donor. This attitude might well be an accurate reflection in those societies in which medicine in general is bought and sold, and particularly those in which underprivileged and undernourished have only limited access to good quality medical care. Thus it is not difficult to envisage a community in which only the top socio-economic 10% have significant access to modern medicine and the remaining 90%, however enthusiastic their contribution to the Community Blood Transfusion Service, would for other reasons have little chance of receiving the powerful therapeutic benefits of blood and blood products, to which they as the largest group might have made the greatest contribution. Such communities may have to continue to rely primarily on systems of voluntary

support which are those associated with friends and relatives of the patient with additional, but costly, assistance from commercial sources. It is a sad fact that such countries can often least afford such a policy.

In those developed countries and/or communities in which this problem does not exist, it is the author's opinion that rewards are not required - nor asked for - by the Honorary Organiser and Blood Donor. However, all too frequently this attitude is interpreted in such a way by the professionals (staff of the Service) that the contribution made by the volunteers is taken for granted. True, some Services make special awards, such as badges, commemorative plates etc. to blood donors achieving certain targets, but these events are relatively infrequent and often lack the personal touch. Within our own community service considerable efforts are made to maintain close personal contact with all Honorary Organisers, even to the extent of inviting them up to the main Centre to look at what is going on and to meet the staff. Visits are made to these people in their own locality and often into their homes. The Honorary Donor Organisers are strongly encouraged to let the Centre know if any of their blood donors fall ill and are admitted to hospital, and the staff in the Centre respond by arranging a visitation and/or some tangible acknowledgement such as the delivery of flowers. Local knowledge of births, deaths and marriages can reduce embarrassment or hurt from an untimely call-up letter. Complaints directed towards members of staff at Sessions or the temperature of the tea are dealt with quickly, positively and sympathetically; like the customer, the donor is always right. Thus the pattern is set for a caring community service, and for the volunteers this has proved to be reward enough.

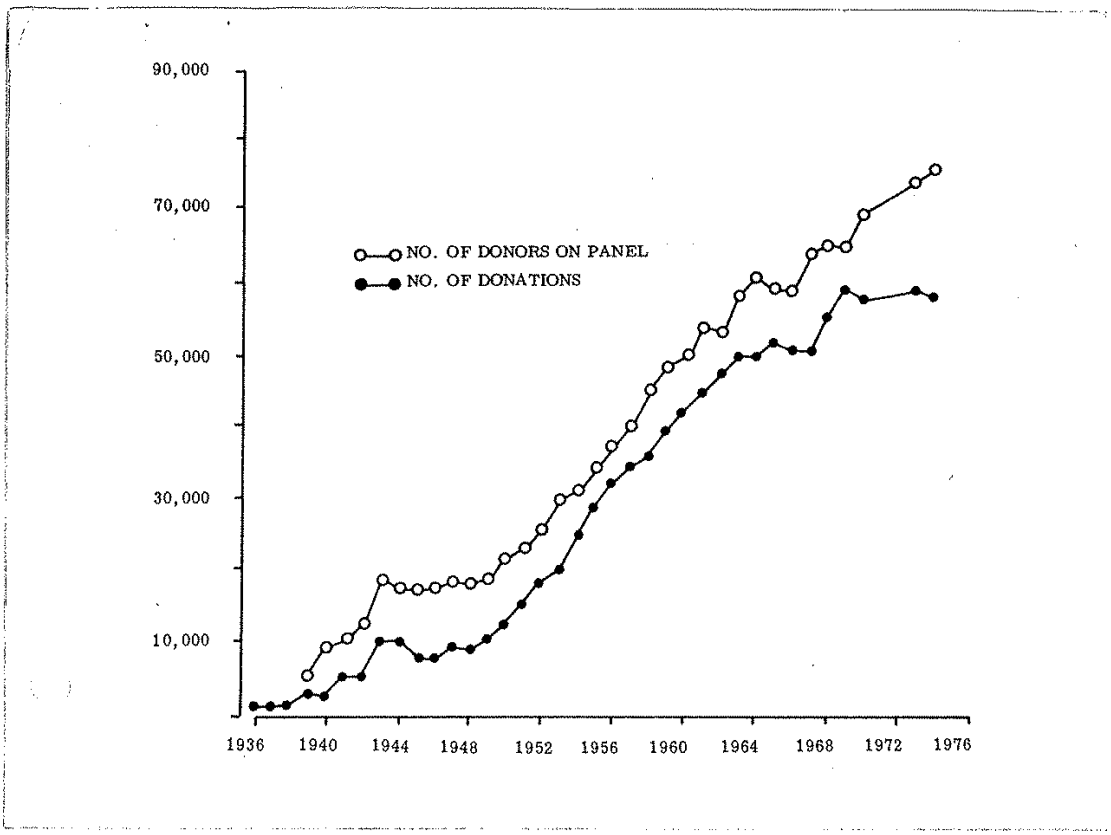
For the professional staff of the Centre this level of concern and active interest in the voluntary side of a Blood Transfusion Service means time and effort and also raises the question of the optimal or maximum population size of a fully comprehensive community Transfusion

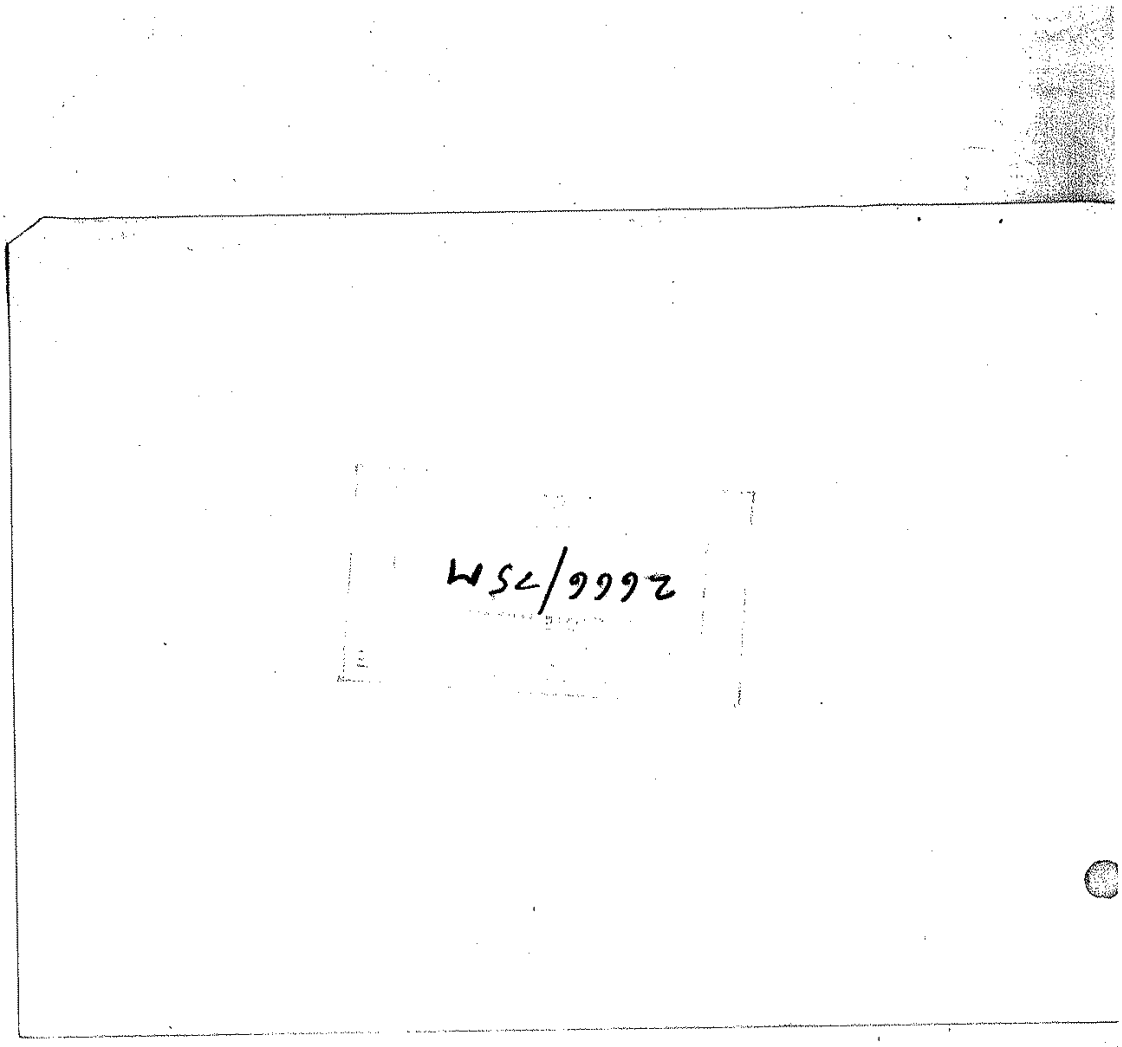
Service. It is the author's opinion that perhaps the maximum size should be less than 1.5 million. It seems probable that this figure also corresponds to the maximum population within which the medical staff of the Transfusion Centre can control effectively the appropriate clinical use of blood and blood products. These two aspects of the voluntary blood donor system ensure that the unique association between the donor and patient is efficient, effective and always ready for inspection.

It has often been assumed that the more sophisticated developments currently emerging in Blood Transfusion, that involve the donor in procedures concerned with deliberate immunisation (not without risks) and prolonged periods of plasmapheresis, will inevitably reveal the true weakness of a purely voluntary donor system and that tangible rewards are required for complete success. Our own experience in this field, for instance in the area of the hyperimmune plasma productinn would not appear to confirm the inevitable nature of this view. There is no doubt that for the Service these developments represent important new ethical as well as medical care problems. However, provided donors are carefully recruited for these special tasks, fully briefed by an enthusiastic and caring staff, then most donors' interest have been found to be both intense and permanent. Thus in 1974 from the population of 1.25 million, significant quantities of hyperimmune plasma were obtained by plasmapheresis for therapeutic purposes (Table I). It is also of interest to record that the much maligned citizen who is a chronic carrier of HB_sAg has, over the last 3 years, emerged to be a valuable donor and represents a new group of volunteers. Many of these new donors are former patients with no previous association with the Blood Transfusion Service, but who readily agree to plasmapheresis in order to supply not only therapeutic products but also reagents which enable the Blood Transfusion Service to group and cross-match red cells, white cells and platelets derived from the more classical type of donor and also make available valuable plasma such as

factor VIII deficient plasma (Table I).

For a community Blood Transfusion Service a voluntary donor system has many unique advantages. Above all are those of safety and economics. In those societies in which there is ready access to medical care and education for all members of the population there is every reason to believe that the community will respond and make available more than enough blood and blood products. Failure in these communities denotes inadequate planning, funding or communications, all of which are administrative problems. It is unlikely that the causes will be related to fundamental changes in the moral and social structure of the community or country, except in times of serious internal strife, such as civil war.


90,000
70,000
50,000
30,000
10,000
NO. OF DONORS ON PANEL
NO. OF DONATIONS
1936
1940
1944
1948
1952
1956
1960
1964
1968
1972
1976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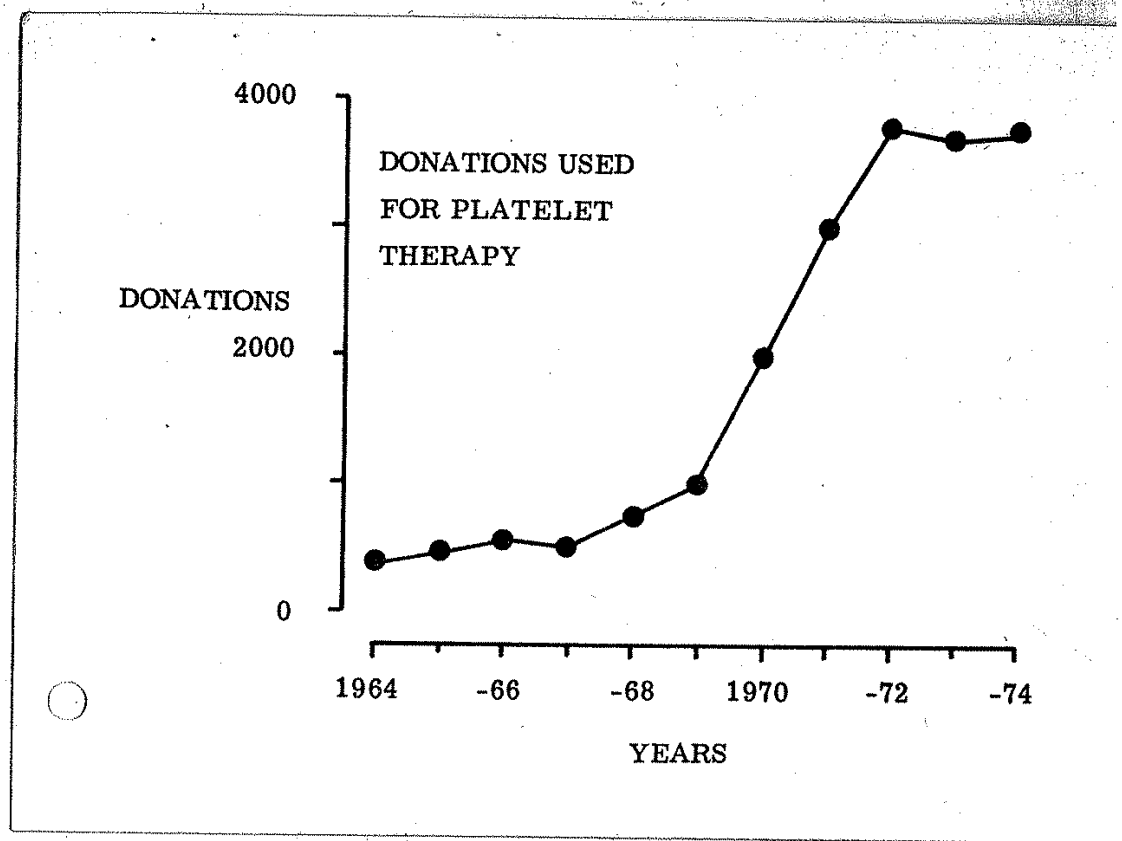
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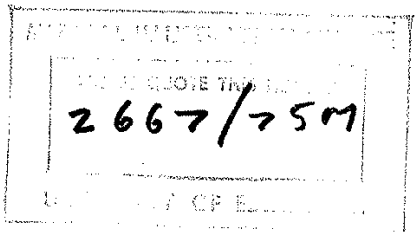
DONATIONS USED
FOR PLATELET
THERAPY
DONATIONS
2000
0
1964
-66
-68
1970
-72
-74
YEARS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