

SCOTTISH NATIONAL
BLOOD TRANSFUSION
SERVICE



ANNUAL REPORT
1988-89

MANAGEMENT TEAM



Professor Cash and the Team

NATIONAL MEDICAL DIRECTOR

Professor J D Cash

BSc, MB, ChB, PhD, FRCPath, FRCPE

DIRECTOR, ABERDEEN CENTRE

Dr S J Urbaniak

BSc, MB, ChB, PhD, MRCPath, FRCPE

DIRECTOR, DUNDEE CENTRE

Dr E Brookes

MB, BS (London) MRCS, LRCP (London), FRCPath

DIRECTOR, EDINBURGH CENTRE

Dr D B L McClelland

BSc, MB, ChB, MD (Leiden), PhD, FRCP

DIRECTOR, GLASGOW CENTRE

Dr R Mitchell

BSc, MB, ChB, MD, FRCPG, FRCPath, FRCPE

DIRECTOR, INVERNESS CENTRE

Dr W Whitrow

MB, BS (London), MRCS, LRCP (London), DCP, FRCPath

DIRECTOR, PROTEIN FRACTIONATION CENTRE

Dr R J Perry

BSc, PhD, MRSC

NATIONAL ADMINISTRATOR

Miss Morag Corrie

MA (Hons), DSA, FHSM

FINANCE OFFICER

Mr J N Francis

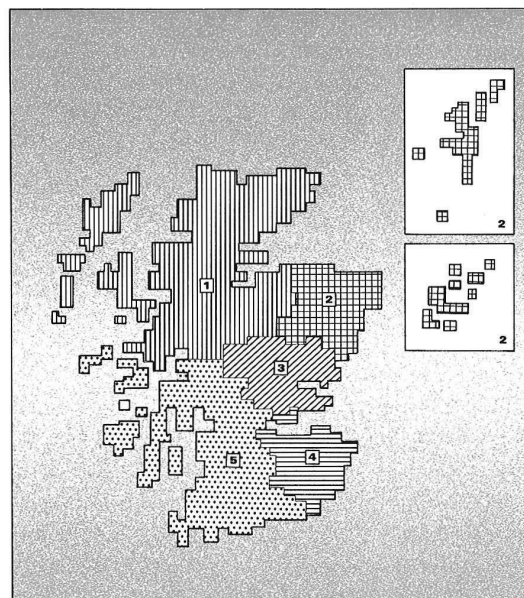
SCOTTISH NATIONAL BLOOD TRANSFUSION SERVICE

Although the Scottish National Blood Transfusion Service (SNBTS) was founded in 1940, blood transfusion, in some form or other, was actively practised in Scotland throughout the previous decade. From 1940 to 1974 the development and maintenance of this national service was the direct responsibility of a voluntary body called the Scottish National Blood Transfusion Association. In 1974 the Secretary of State for Scotland transferred this responsibility to the Common Services Agency of the Scottish Health Service.

In practice, the Management Committee of the Common Services Agency delegates much of its management function for the Service to its Blood Transfusion Service Sub-Committee and the General Manager of the Agency.

There are 7 operational units which make up the SNBTS: 5 Regional Transfusion Centres (based in Aberdeen, Dundee, Edinburgh, Glasgow and Inverness), the Protein Fractionation Centre and the Headquarters Unit (both located in Edinburgh). The total population served is approximately 5.2 million. Each Regional Centre is responsible for the collection of blood donations from its own local panel of voluntary blood donors and the provision of blood and blood products as well as a wide variety of diagnostic and clinical consultation services for all the health services within its regional boundaries. The Regional Centres also provide all the plasma required by the Protein Fractionation Centre which returns the products prepared from this plasma to the Regional Centres for use in health service establishments, including, when appropriate, primary care (general practice) establishments. The Protein Fractionation Centre also processes plasma collected in Northern Ireland and returns the products to the Blood Transfusion Centre in Belfast. The Headquarters Unit is responsible for the overall co-ordination of the national service.

The responsibility for the operational management of those aspects of the service which are national in character primarily rests with the Centre Directors who meet with the National Medical Director at regular intervals to plan future strategies and monitor performance.



1 North (Inverness) 2 North East (Aberdeen)
3 East (Dundee) 4 South East (Edinburgh)
5 West (Glasgow and at Law Hospital)

NATIONAL MEDICAL DIRECTOR'S REPORT



In my report last year I referred to our growing concern that in the preceding 18 months we had noticed a decline in the traditionally strong support we have enjoyed from blood donors throughout Scotland. In the intervening 12 months a large number of our staff and voluntary organisers have worked extremely hard and we now have some reason to believe that the decline has been checked and certainly in some parts of Scotland it appears to have been reversed. We cannot be content to rest on our laurels for we believe we need to increase our blood collection programme by a further 40,000 donations per annum to meet the many and varied needs of patients in the 1990s.

It is our experience, in common with many other Transfusion Services in other parts of the developed world, that the effort required to stand still seems to be greater than it was in the 1960s and 1970s. Once again therefore we are mounting a major media campaign to recruit new donors and intend to appoint, for the first time, a full-time person to co-ordinate and support, on an all Scotland basis, the work of our blood donor recruitment and blood collection programmes.

Last year we rejoiced with the news that the government had approved the building of a new Regional Blood Transfusion Centre in Aberdeen. This year a £5m investment in the Protein Fractionation Centre at Liberton, Edinburgh, has been approved. There can be no doubt that this represents an essential element in our plans to maintain self-sufficiency up to the year 2000. This capital investment will be used to modernise and extend our manufacturing facilities.

This year has seen the first major development, initiated by the SNBTS Directors, to rationalise and enhance the effectiveness of our Regional programmes to manufacture reagents: products used in laboratories

for diagnostic purposes, particularly the blood grouping and crossmatching of blood for patients. We have appointed a National Reagents Manager and the first steps have been taken to achieve the targets set by the Directors.

We have taken a view that one of the key developments to emerge with the harmonisation process of 1992 will be the need to ensure that our large pool plasma products have product licences - independent certification of their safety and efficacy. As a consequence we have appointed a Clinical Trials Manager to co-ordinate a major part of this work and liaise with clinicians throughout Scotland. In addition a product licensing officer has been appointed in the Protein Fractionation Centre. The benefits of these developments are already evident and we have some confidence that we will be well prepared for 1992.

The anticipated £5 million capital investment in the Protein Fractionation Centre has led us to give careful consideration to further optimise that aspect of our research which is directed towards plasma product development. We anticipate major reorganisation and rationalisation as we seek to put in place improved scientific support designed to enhance the quality of existing products and develop new ones.

There has been much evidence of government support this year for the Scottish National Blood Transfusion Service and the Directors and staff have been conscious of a reaffirmation of support for the concept of the voluntary blood donor, a nationally integrated and managed Blood Transfusion Service and a consolidation of the commitment to self-sufficiency in safe and efficacious blood and blood products. The tasks ahead for the staff of the SNBTS are formidable but we look forward to the Service's 50th Anniversary in 1990. The celebrations are being planned at this time and will be many and varied and will certainly involve our blood donors.

It is my pleasure once again to thank our blood donors and our staff. 1988/89 has been a highly productive year and one in which the course of the "SNBTS Ship" has been significantly adjusted in order to meet the future needs of the Scottish Health Service for blood and blood associated products.

John D. Cash

BLOOD DONATION COLLECTION PROGRAMME

ROUTINE BLOOD COLLECTION PROGRAMME

Blood collection is an intensely local community activity and it is in this context that it is planned and undertaken. The individual programmes are planned by the Regional Donor Organisers and their staff and the Donor Sessions undertaken by the medical and nursing staff and their teams of donor attendants. Although the individual Regional Centre programme targets are primarily directed towards local blood/blood product needs they are also influenced by the plasma requirements of the Protein Fractionation Centre which are set by the SNBTS Directors each year. Approximately 20% of the routine blood donations in Scotland are collected in the Regional Centres but the bulk arises from local sessions

within the community. In years gone by much of this "community derived blood" was obtained from donors in their work place but as the industrial base of Scotland has changed the SNBTS has been forced to move nearer to donors' homes - village halls and church halls etc. This transition has not always been easy primarily because adequate local accommodation may be in short supply. The problem was tackled, principally in the West of Scotland, by the introduction of mobile donating centres (Bloodmobiles).

Reference has already been made to the pleasing recent trends in numbers of donors attending our Sessions. The statistical information is displayed below along with the planned targets up to 1996.

DONOR ATTENDANCES CURRENT AND PLANNED							
1988/ 1989	1989/ 1990	1990/ 1991	1991/ 1992	1992/ 1993	1993/ 1994	1994/ 1995	1995/ 1996
324001	328900	338330	342125	348105	354890	360525	367310

APHERESIS PROCEDURES

Apheresis procedures are those in which a donor gives a particular part of his/her blood to the Service and that part which is not required is returned to the donor immediately after, or during the donation. This type of procedure, which takes a little more time than a routine donation, enables the Service to acquire large quantities of especially needed products at a single donation "sitting". Apheresis is increasingly being undertaken using machines and the procedure enables the Service to obtain vitally needed special plasma (perhaps containing much needed rare antibodies), platelets (essential products

for the treatment of some people with leukaemia) and white cells (occasionally needed to treat patients with severe infections). Apheresis also provides an operational option to obtain significant quantities of plasma that would usually be obtained from routine donations and is primarily needed to prepare, at the Protein Fractionation Centre, factor VIII concentrates and albumin solutions. Machine apheresis can also be used therapeutically - in the direct management of patients, usually by facilitating the exchange of plasma.

APHERESIS PROCEDURES				
For Source Plasma	For Diagnostics (Reagents)	For Platelets	For White Cells	Therapeutic Apheresis
4745	202	861	95	385

DONATIONS COLLECTED FOR REAGENTS

Blood donations cannot be transfused into patients until a whole battery of laboratory tests are performed. The SNBTS Regional Centres also provide extensive diagnostic services for patients which are based on laboratory tests. All these tests require the ready availability of a range of special materials called reagents, many of which are obtained from blood donors, some of whom were at some time patients themselves.

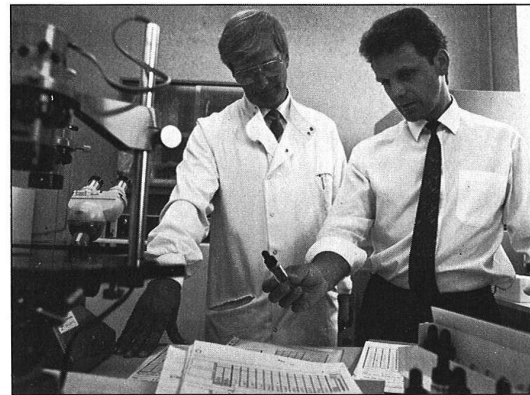
For many years the SNBTS has made considerable efforts to prepare its own reagents primarily because at the outset it was deemed important to match the quality of reagents required with the type of tests being performed. These reagents are used within our Regional Blood Transfusion Centres and many are made available to hospitals throughout Scotland.

This activity of the SNBTS is one which contributes to maintaining high standards of technical expertise in health service laboratories in Scotland. It is also highly cost-effective and as a consequence enables many parts of our health service to save much needed revenue monies which can be invested in other patient care services.

Over the past 2 years substantial research efforts have been made to develop a biotechnology approach to this reagent programme. Much of the basic research for this programme has come from work undertaken by staff within the Glasgow and Edinburgh Centres. Progress has been excellent, and cell-lines, producing potent monoclonal antibodies to blood group antigens, have been created and have been transferred to the Biotechnology Unit at the Protein Fractionation Centre. As a consequence large quantities of these reagents are now widely available for the whole of the Scottish Health Service. Some highly specialised blood group (monoclonal) antibodies (required in small amounts) are also produced for the Scottish Health Service by the Glasgow Centre. It is anticipated that in the years ahead further research will enable the SNBTS to extend substantially the range of monoclonal (blood group) antibodies for diagnostic and other uses.

Reference has already been made to the moves by the Directors to further improve this Service. The essential elements in the new development will be the production of SNBTS reagent performance specifications and the co-ordination of Centres' efforts to produce improved quality and quantities of the reagents on a national basis. To this end a National Reagents Manager has been appointed this year who will be located with his supporting staff in Edinburgh.

It is a pleasure to note that some of the reagent monoclonal antibody scientific expertise developed in the SNBTS has been transferred to a Scottish company which is manufacturing and marketing these and other reagents worldwide. Thus in this area the SNBTS has contributed significantly to creating jobs in Scotland.



Checking BTS Reagent in the Laboratory

DONOR LABORATORY SERVICES

BLOOD DONATION TESTING

Every donation collected by the SNBTS undergoes a variety of tests designed to ensure the maximum safety when transfused into patients.

The battery includes:

ABO group antigens
Rhesus (D) blood group antigen
Syphilis tests
Hepatitis virus (B) tests
Human Immune Deficiency Virus (antibody) tests*

ROUTINE TESTING OF DONOR SAMPLES	
(Unit = a test)	Year ending 31 March 1989
ABO & RH (D) Status	311,595
High titre Anti-A, Anti-B and/or Anti-A/B	7,657
Red Cell Antibody Screen	294,217
VDRL	262,927
TPHA	50,969
HBs Ag	313,691
CMV	37,317
Red Cell Phenotype	12,976
HLA Phenotype	817
HIV Antibody	313,691
Tetanus Antibody	11,486
Hepatitis B Antibody	33,798

* Human Immune Deficiency Virus is the cause of acquired immune deficiency syndrome (AIDS)

Each working day over 1000 blood donations are collected in Scotland, and it is not surprising that considerable efforts have been made to automate the large number of tests required to ensure the accuracy of tests and thus the safety of these donations. At the same time, large quantities of data are obtained and the Service has introduced computerisation to provide rapid interpretation of the laboratory results and to link these results with individual donations.

In addition to safety, donations are also screened in search of antibodies that may be of value as diagnostic reagents or special therapeutic products.



High Technology in Donation Testing

DONOR LABORATORY SERVICES

BLOOD DONATION PROCESSING

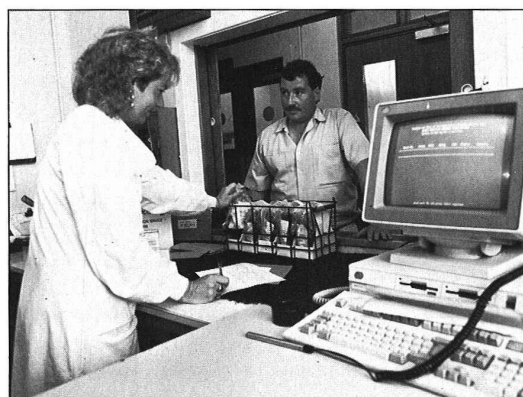
Blood donations contain a large number of quite different substances, each of which may be of unique and life-saving value to a particular patient. In many instances the amount of these substances in each donation is so small that even giving several donations of whole blood will not provide enough of the particular part of a donation some patients need. A modern blood transfusion service therefore spends much of its time extracting these unique substances from each blood donation as is required and "packaging" them in a form that can be used thereafter to treat individual patients.

Year ending 31 March 1989	
Total Donations available for Processing	266,259
PRODUCTS PLACED AT ISSUE	
Whole Blood (Unit = 1 donation)	22,454
Red Cell Concentrate	237,144
Platelet Concentrate	55,028
Buffy Coat Depleted Blood	392
Specialised Red Cell Products	1,034
White Cell Products	629
Cryoprecipitate	11,606
FFP Clinical Units (200ml equivalents)	14,362
Total Non-Immune Source Plasma (Kg)	2,434

Approximately 80% of the blood donations collected in Scotland undergo this extraction process to make a wide range of essential blood products. Thus the majority of our blood donors can assume, quite correctly, that their single donation may be used to treat many different patients. This feature of the work of the Blood Transfusion Service is a key element in the programme of each Regional Centre which led to a national self-sufficiency in blood and blood products.

SOME EXAMPLES OF THE USE OF PRODUCTS

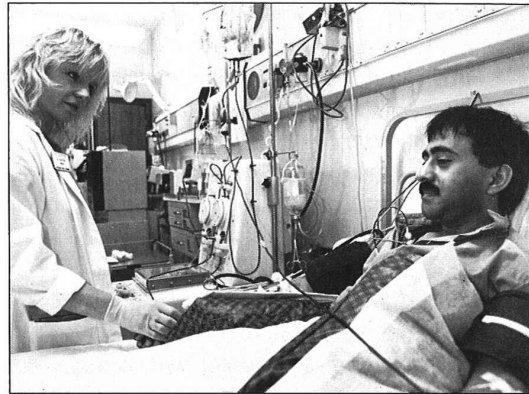
WHOLE BLOOD	Severe massive haemorrhage (Road accident, etc)
RED CELL CONCENTRATE	Anaemia: Routine Surgery
BUFFY COAT DEPLETED AND SPECIALISED	Blood Group Compatibility Problems
PLATELETS	Some cases of leukaemia: major cardiac surgery
WHITE CELLS	Some cases of severe infection
CRYOPRECIPITATE	Severe obstetrical haemorrhage: Haemophilia A
FFP	Haemorrhage sometimes associated with severe liver disease



Donations on their way to the patient

CLINICAL LABORATORY SERVICES

All of the SNBTS Regional Transfusion Centres are actively involved in providing a variety of clinical laboratory services, such as regional blood group reference serology services and antenatal care services. These services are directed towards patients rather than healthy blood donors. Four (Aberdeen, Dundee, Edinburgh and Inverness) bear the largest burden, in their respective regions, of the crossmatching services – the laboratory testing of blood group compatibility between patient and blood donation and tissue typing for organ transplantation. All these services require meticulous and high quality skills, many of which are available 24 hours a day, 7 days a week. Another requirement for many of these services is technical precision, speed and the ability to work under pressure.



BTS involvement in patient care

SOME WORKLOAD STATISTICS	
Year ending 31 March 1989	
Standard compatibility procedures (patient samples)	47,949
Investigation of Transfusion Reactions (patient samples)	400
Group and screen (patient samples)	48,311
White cell/platelet antibody screen (patient/donor samples)	19,776
Tissue Type (patient/donor samples)	1,883
Red cell antibody identification quantification (patient samples)	6,072

The availability of high quality reagents is also a major supporting factor for this work.

An important feature of the clinical services is the opportunity given to the medical staff at the Regional Transfusion Centres to have an influence on the use of blood and blood products in the management of individual patients. At the present time this aspect of clinical blood transfusion practice is receiving world-wide attention as the arrival of AIDS has produced an enhanced awareness of the need to examine even more critically the need for blood transfusion on an individual patient basis.

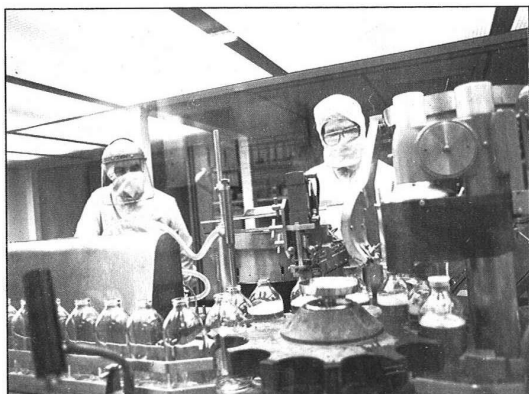
PROTEIN FRACTIONATION CENTRE

The Protein Fractionation Centre (PFC) located at Liberton in Edinburgh, has been a most important SNBTS investment of recent times. It was commissioned in 1975. The function of this Centre is primarily to produce, on a large scale, a variety of biological products from plasma – a substance which makes up approximately half of each blood donation. The Centre also produces significant quantities of different salt solutions and reagents, all used in the Regional Transfusion Centres.

The Protein Fractionation Centre is a high technology, pharmaceutical manufacturing establishment with supporting engineering, research and development facilities. The products produced are all issued to the Regional Transfusion Centres and subsequently direct to patients, General Practitioners or Hospital Blood Banks.

Of particular interest and importance in the last two years has been the development of production scale biotechnology. The current thrust of this programme is in the area of monoclonal antibody production and its associated downstream technology. It seems certain that this development will provide a new range of both diagnostic and therapeutic products for the Scottish Health Service that will be derived in part from cells grown in the waste products of plasma fractionation.

PLASMA RECEIVED (Kg) Year ending 31 March 1989	
Fresh Frozen Plasma	51,922
Cryosupernatant	3,106
Out-dated Plasma	3,559
Hyperimmune Plasma	1,912
Plasma from Northern Ireland	14,084



BLOOD PRODUCTS ISSUED (Including Northern Ireland) Year ending 31 March 1989		
PRODUCT	UNIT SIZE	ISSUED
<i>Coagulation Factors</i>		
Factor VIII	200iu	41,335
Factor IX	200iu	9,160
<i>Immunoglobulins – Intramuscular</i>		
Normal	750mg	12,125
Normal	12iu	2,082
Rh (D)	5000iu	40
Rh (D)	500iu	11,991
Rh (D)	250iu	4,926
Tetanus	250–300iu	4,175
Hepatitis (HBV)	500iu	1,519
Varicella-Zoster	500mg	490
Rubella	25,000iu	20
Rabies	800iu	53
Mumps	500mg	0
Measles	500iu	65
<i>Immunoglobulins – Intravenous</i>		
Normal	3g	8,485
CMV	1.5g	578
CMV	3g	713
Measles	1.5g	46
Tetanus	3000iu	8
<i>Albumin Products</i>		
Human Albumin	20g	5,086
Human Albumin	1g	1,340
Stable Plasma Protein Solution	18g	86,384
Stable Plasma Protein Solution	4.5g	2,247

The arrangements whereby all plasma generated by the Northern Ireland Blood Transfusion Service is sent to PFC for fractionation continues to operate satisfactorily.

Dispensing products in sterile conditions

AROUND THE CENTRES

INVERNESS

The Inverness Donor Panel is now being successfully managed through the "DOBBIN" (Donor Office and Blood Bank Information Network) mainframe in Edinburgh which is a key feature of the National SNBTS computer system. The first "live" call up occurred in November. Each panel was entered and verified prior to the next session over a six month period. At the end of March all old fashioned donor record cards became redundant. The benefits of this system are becoming apparent with access to more detailed donor information and the ability to target specific donor groups for call up for particular purposes.

During this year two plasmapheresis machines were installed. Both staff and donors have been very enthusiastic about this new system of plasma collection, which is quicker than the manual method. About half the plasmapheresis is now done by machine: machine plateletpheresis will soon be introduced.

The blood collection in all areas has increased again after the slight reduction last year. Stornoway, on the island of Lewis, produced an incredible 604 units in 2 days in August. This trip, despite the long hours and hard work, is regarded as the social highlight of the year by the collection team. On November 15 the team collected 480 donations at a single session in Fort William.

Tuesday 14 February (St Valentine's Day) will never be forgotten. The Donor Organiser discovered by a chance telephone call that the electricity was cut off and that a large tree completely blocked access to Dingwall Primary School shortly before our scheduled session in the evening. This was due to a freak storm which caused widespread damage. An emergency generator was obtained and the local Council kindly removed the tree in time as a result of an impassioned appeal by the Regional Donor Organiser. The session was a great success, producing 177 donations.

ABERDEEN

The planning process for the new Regional Centre is almost complete and contractors should be on site for the beginning of the actual building works by the time of the publication of this Annual Report. Attention can now be focused on planning for the move and on preparation to meet the needs of product liability, harmonisation with the EEC and other legislation which will have a bearing on the manufacture and supply of safe and effective blood products.

The announcement that Aberdeen Royal Infirmary was to be the fourth Cardiac Surgery Centre for Scotland was received with considerable satisfaction by Grampian Health Board (and ourselves of course!), and already the throughput of open heart surgery operations has increased by threefold. By the time the new Regional Centre and Blood Bank are fully operational, over 300 operations per annum will be undertaken. So far our staff have coped admirably with this increased demand at a time of diminishing resources.

This year, for the first time a practical course was held for the staff of the peripheral blood banks, which are located in Orkney, Shetland and Elgin. The course was considered a success by the participants (as well as the organisers!). We hope this will become an annual event.

A Regional Bone Bank has been initiated as a joint venture between the Regional Centre and Grampian Health Board as one of the first of its kind in the UK to be modelled on the American Association of Tissue Banks. Initially, femoral heads removed during surgery will be stored frozen (after rigorous safety checks) and issued to patients undergoing orthopaedic operations who may not have sufficient bone of their own for grafting. The system is analogous to blood banking, and the equipment has now been installed in the RTC and evaluated. A bone bank co-ordinator will be appointed and be based at the Royal Infirmary in the Regional Centre.

AROUND THE CENTRES

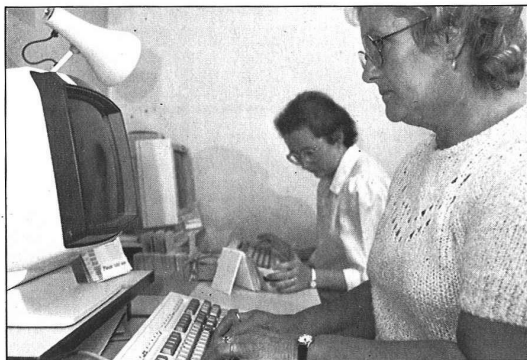
DUNDEE

1989 marks the 50th anniversary of the inception of the Blood Transfusion Service in Dundee. Just before the outbreak of the second World War, Professor Dan Cappell obtained two rooms in the basement of the Pathological Department of the Dundee Royal Infirmary, "for the sole use of the Service on the understanding that all the advantages and facilities provided by the Service would be made available to the patients in the Dundee Royal Infirmary".

The work of putting the Centre's records on to the national (SNBTS) computer system is progressing and this year we are concentrating on the donor panel. It is expected that the system will go 'live' in August 1989.

The Centre took delivery of a new donor blood grouping machine, the prototype of which was developed by staff in the Transfusion Centre in Inverness.

We are also very pleased to welcome visitors from abroad who wish to gain experience in the Centre and our visitor in the summer of 1988 was Dr Kalpana Mayekar from the Municipal Blood Centre, Bombay, who spent a month in our laboratories, going to laboratories in Sweden before returning to Bombay to develop the Transfusion Service there.



Keying-in information to new Donor Record System

EDINBURGH

There were record donor attendances in the South East last year, a considerable achievement as in July the Region was 15% below target. This recovery was only possible thanks to the magnificent support of local voluntary organisers, press and many others. A review of donor management practices is under way and the apheresis programme will be developed in the coming year.

Immunology Services have expanded and now include Autoimmune Serology and Immunochemistry.

Automation now extends to the handling of samples in the Virology Laboratory (Hepatitis and HIV testing) and in the continual drive to produce more plasma the Centre has been working hard to improve procedures in the Components Section and in the transport of blood from sessions. Semi-automated plasma expressors have been introduced (the Inverness system) and a new blast freezer is both faster and more cost efficient.

A study was undertaken of new anti-coagulant using half strength citrate. It is hoped this will improve Factor VIII yield and 4000 donations have already been processed and despatched for fractionation.

There have been visitors to the Centre from many countries including India, Spain, Romania, Ireland, Ethiopia and Poland.

GLASGOW AND WEST OF SCOTLAND

Since last year's Annual Report, a major worrying feature of our activities has been the downturn in the donor attendances. Major efforts at national and local publicity have helped to stem the downward trend but there is much to do to restore our fortunes to the high levels of 1985.

Visitors from overseas and elsewhere continue to attend the Centre for short-term and long-term attachments. Such work has been assisted by the opening of our new Seminar Room which is proving very popular with all staff.

Our Consultant colleague, Dr Gamal Gabra, left us to join the League of Red Cross and Red Crescent Societies in Geneva as Global Blood Programme Adviser.



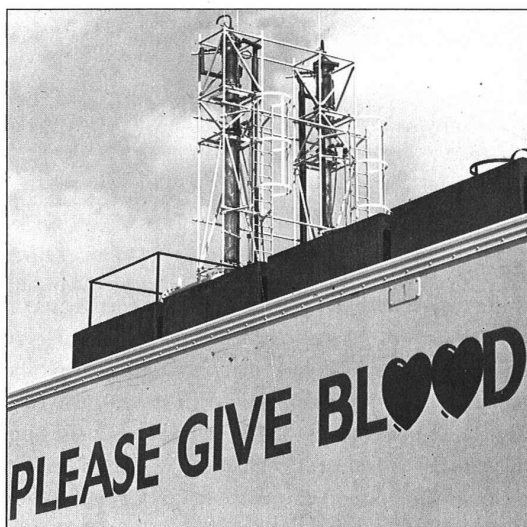
New seminar facilities in use

AROUND THE CENTRES

PROTEIN FRACTIONATION CENTRE

1988/89 was another very busy year for the Protein Fractionation Centre with continuing significant increases in demand for its products. The Centre has also been engaged in the improvement and modification of its existing products and the development of major additions to its product range. Notable amongst these is an immunoglobulin product which contains very high levels of antibody (monoclonal) against Hepatitis B. Preliminary trials of this material in liver transplant patients with severe Hepatitis B infection suggest that this may be an important product in the future.

Demand for Factor VIII in 1988/89 exceeded supply and Scotland was not self sufficient and thus significant purchases of commercial FVIII occurred. Plans to recover our position of self sufficiency are now in place and it is hoped that the Service will regain self sufficiency by mid 1990. These plans include further expansion following a Government announcement of a £5m building development. This is welcomed and will be an important part of a programme to take the Service through the 1990s into the year 2000.



A new angle on PFC: refrigerated vehicle in front of alcohol tower

HQ LABORATORY

With the departure of Dr Joan Dawes and the closure of the MRC/SNBTS Blood Components Assay Group, the HQ Laboratory assimilated most of Dr Dawes' staff under the management of Dr Ian MacGregor, and they will continue to direct their expertise into applications of immunoassays of interest to the SNBTS.

Significant progress was made in the area of producing a safe haemoglobin based oxygen carrying plasma expander starting with outdated red cell concentrates – the effective removal of diverse adenine nucleotides by extensive dialysis has been monitored by HPLC and confirmed in a blood pressure model. The modified cross-linked haemoglobin is now being evaluated further by surgeons in a Belfast hospital.



Research underway into haemoglobin based plasma expander

The laboratory was fortunate in having Dr Vaclav Madr from Prague visiting for 3 months, funded by the International Atomic Energy Agency. He has introduced non-isotopic assay technology based on Europium fluorescence in the delayed detection mode. This remarkably simple technique seems to have the advantages of radioisotopes and ELISA with the disadvantages of neither.

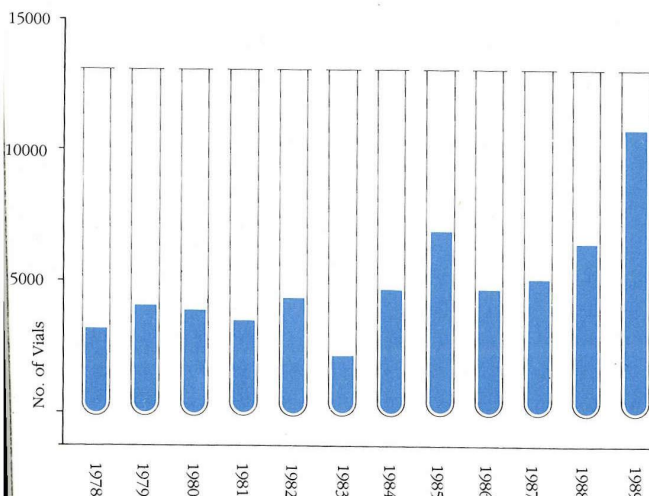
TRENDS

HOLIDAYS ABROAD AND GAMMAGLOBULIN

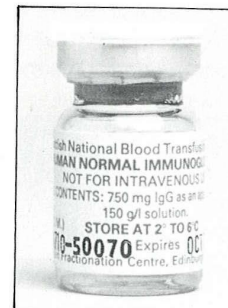
The SNBTS has for many years manufactured at its Protein Fractionation Centre a product, which is issued from our Regional Blood Transfusion Centres, that, among other things, can be of value in the *prevention* of certain forms of viral hepatitis, which can be acquired by visitors to certain foreign countries. The product is called gammaglobulin or normal immunoglobulin and is usually given in the week prior to departing to those foreign parts where health authorities consider the risk of contracting viral hepatitis is high. The administered gammaglobulin contains antibodies against the hepatitis virus and thus prevents the holidaymaker or business traveller from contracting this disease.

The expansion of the holidays abroad market combined, we assume, with an enhanced awareness of the availability of our product, has led to a considerable increase in the demand for gammaglobulin. In 1989/90 we had to make significant changes in our production schedules to cope with the escalation in demand (see below). We see a further expansion of this demand over the next decade and it is yet another interesting example of the way in which blood donors can give assistance in the *prevention* of disease.

Years to 31 March
Intramuscular Immunoglobulin Issues



Fully prepared with passport ... and immunizations up to date



Vial of immunoglobulin

RESEARCH INTO AIDS

In November 1988 a new Unit was opened, based in the Edinburgh Transfusion Centre, specifically to undertake research and diagnostic work on the immunological problems affecting patients with HIV. This Unit was funded by SHHD with contributions from the University, Lothian Health Board and CSA.

In its short period of operation the Unit has already produced important new information showing the extent to which the immune system is damaged even at relatively early stages of HIV infection.

This information will play an important part in projecting the size of the AIDS problem in South East Scotland and in evaluating new forms of treatment for HIV infection.

SERVING THE PRIVATE SECTOR OF MEDICINE

The NHS (Scotland) Act 1978 requires the SNBTS to supply blood and blood products to the private sector without detriment to the National Health Service.

In 1987 the Common Services Agency signed agreements with those of Scotland's private hospitals in which blood is required for the SNBTS to supply pre-arranged quantities of those blood products which are plentiful. Some other products are available for named patients only while there is a list of which are in short supply and not normally available.

The agreement required both sides to give periods of notice of any change in the quantities supplied or required except in certain emergencies when changes can be made immediately. The SNBTS can retrieve blood already supplied if there is an urgent NHS need.

A handling charge is made for each product supplied and every laboratory test undertaken. This charge represents the labour and materials used in procuring processing and issuing the products: there is no charge for the blood itself and the private hospitals and clinics may not charge patients more than the handling charge levied by the SNBTS.

The Regional Transfusion Directors maintain close links with the private hospitals and clinics in their regions. This includes the holding of at least one formal meeting a year as well as visits to ensure that conditions for the storage of the products supplied are satisfactory.

90% of the blood supplied is in the form of red cells, enabling the SNBTS to use the plasma. The total number of packs of red cells supplied in the year to 31 March 1989 was 1.26% of the total red cells produced. The full picture is shown in the table.

ISSUES TO PRIVATE SECTOR Year ending 31 March 1989		
PRODUCT	No. SUPPLIED	% OF TOTAL SNBTS PRODUCTION
DONATIONS		
Whole blood	211	0.94
Red cell concentrate	2,985	1.26
Platelet depleted blood	0	0
Platelet concentrates	15	0.03
Cryoprecipitate	30	0.26
UNITS (200ml)		
Fresh frozen plasma	60	0.42

DONOR MANAGEMENT

RESEARCH

During the year the University of Strathclyde's Advertising Research Unit undertook for the SNBTS a study of the Scottish attitudes to blood donation and AIDS. The objective was to assess whether the issue of AIDS had been a feature in the decline in donor attendances. The study comprised a quantitative survey using personal interviews and a qualitative one involving group discussions. The former comprised a representative sample of 976 Scottish adults, the latter 16 groups of 5 to 8 respondents who were assigned to the groups according to donating experience as well as social and demographic considerations. Both surveys also covered donors' reasons for giving blood and those of non-donors for not doing so.

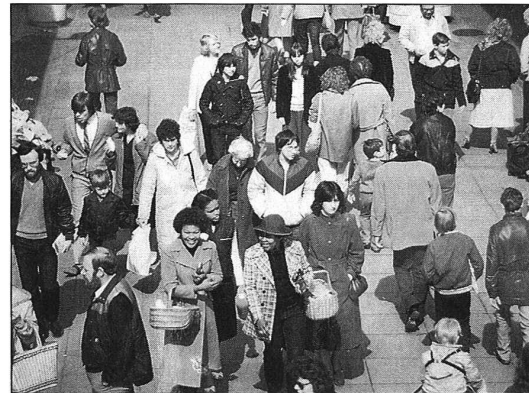
The results demonstrated that AIDS was not an important demotivating factor. However both studies showed respondents to be uncertain about the relation between AIDS and blood donation and 19% of the respondents in the quantitative survey thought it likely that AIDS could be caught from giving blood. Members of the group discussions were also uncertain about certain aspects; for instance some apparently connected AIDS with blood donation because of advertising by the Government which showed shared drug-abuse needles transferring contaminated blood.

The donor discussion groups were reluctant to consider that the issue of AIDS might apply to them personally: pressure on them to consider the matter aroused both fear and resentment, the respondents seeing the Transfusion Service's self-exclusion criteria and information as aimed at donors in a general sense rather than at themselves.

Senior managers of the SNBTS have concluded that a good deal more research is required into the motivation of would-be blood donors and into understanding the key factors by which donors' loyalty to the Service is retained. It also seems probable that the publicity directed towards donors in response to the AIDS epidemic may have been unduly negative.

As a result further research has begun to assess effective methods of screening which will be more acceptable to donors and particular attention is being paid to making the experience of donation as pleasant and rewarding as possible. Steps are also being taken to evolve a publicity campaign which emphasises the more positive aspects of giving blood.

See British Medical Journal Vol. 298 pages 1012-1014:
Scottish Attitudes to Blood Donation and AIDS
S. G. McAskill, G. B. Hastings, R. E. J. McNeill, J. Gillon.



Taking public opinion into account

DONOR MANAGEMENT

RECRUITMENT

It was explained in the last report that, after many years of high levels of donor attendances, the Service began to suffer declines in 1986 which continued through 1987. Recruitment activity was increased, particularly through a month-long commercial Radio and Television campaign in February and March 1988. The target of the increased activity was to reach in the quarter commencing 1 April 1989 the equivalent of 333,000 donor attendances a year (i.e. about 25,000 above the level reached in the summer of 1987).

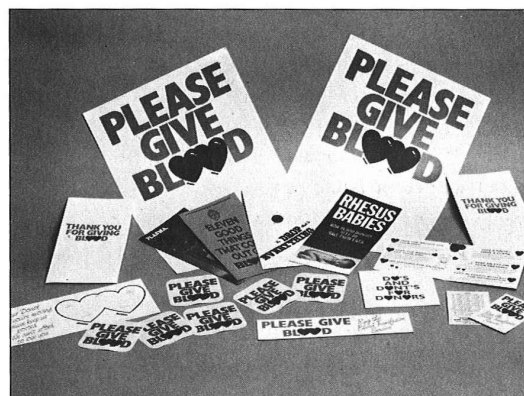
The television campaign ran for 5 weeks and the radio one for 4 weeks, both from mid-February 1988. It was accompanied as far as possible with a personal letter to each donor who had not attended for two years.

Initial results were encouraging. Donor attendances in February and March 1988 actually exceeded the target. This level was however not sustained, April and then July being the worst months for more than 3 years. By the end of the year to 31 March 1989 attendances had reached 324,000 against the target of 333,000. That is 10,000 higher than the previous year. However, there were wide fluctuations and it is too early to say whether the increase will be sustained.

The campaign was evaluated through television viewing figures, public opinion surveys and a questionnaire at donor sessions. The television coverage was high. Such public opinion as was sought through group interviews indicated that there was insufficient urgency in the approach. In the questionnaires completed at donor sessions 74% of donors claimed they attended regularly and only 9% acknowledged having being influenced by the television campaign.

By the end of the year discussions were taking place with public relations companies to determine the most cost-effective method of bringing the Service to the attention of the public in order to sustain required donation levels.

Retaining lapsed donors once they have returned and successfully retaining new ones requires other measures, some of which were completed by the end of the year. These include giving each new donor a welcoming pack of information, making it easier for donors to notify changes of address, and inviting donors who could not attend the session to which they were called, to another held nearby. Experiments are also underway to make the donor health questionnaire more effective and at the same time less intimidating.



Catching the public eye

THE INTERNATIONAL CONTEXT

Mrs Mairi Thornton, Regional Donor Organiser, Edinburgh and South East Scotland, attended by invitation the 2nd Colloquium on recruitment of voluntary blood donors organised jointly by the ISBT, FIODS and League of Red Cross and Red Crescent Societies held in Budapest from 6 to 9 September 1988. This was attended by delegates from 27 countries including the Soviet Union, North America and South Korea as well as many European countries. Issues which Mrs Thornton highlighted in her report were the discussion of marketing techniques in donor recruitment and subsequent customer satisfaction, concentrating on the positive side of blood transfusion.

There was much discussion about motivating potential young donors and reducing the minimum age for donation with reports from countries who have recently done so.

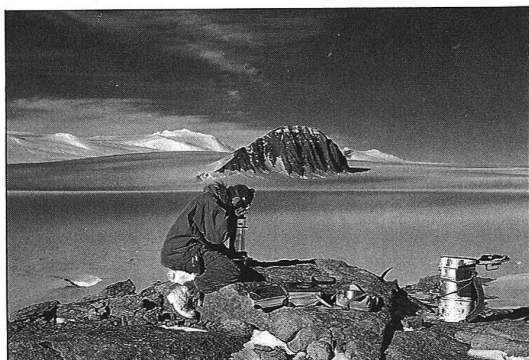
On her return Mrs Thornton conducted a seminar for her Regional Donor Organiser colleagues who are working on some of the ideas which emerged from the colloquium.

TRAINING AT HOME AND ABROAD

The SNBTS undertakes a wide range of education and training, both for its own staff and for visitors from the UK and abroad. One example of the latter is the bi-annual British Council Course in blood transfusion. Here are some others.

BRITISH ANTARCTIC SURVEY

The British Antarctic Survey's bases are manned by staff who each spend a year there. These include medical officers who receive specialist medical training in methods of treatment suitable to the Antarctic. This is organised by the Aberdeen Institute of Offshore Medicine at Robert Gordon's Institute of Technology in collaboration with local Aberdeen hospitals. The Transfusion Centre teaches the doctors (normally relatively recently qualified) the techniques of blood grouping, cross-matching and transfusion. There is a telecommunications link between the Antarctic Survey and Robert Gordon's and the Transfusion Director is sometimes consulted for advice in undertaking emergency transfusions in situations where the doctor is on his own and has minimal resources.



Antarctic Survey. Photo by courtesy of R G I T Aberdeen

POSTGRADUATE MEDICAL COURSES

The West of Scotland has for many years run courses of instruction for postgraduate doctors preparing for higher diplomas such as the Membership of the Royal College of Pathologists. These courses are very popular and consist of lectures, tutorials and, more importantly, practical sessions. Many doctors, now Consultants, from the UK and overseas have attended such courses. It is always gratifying to see the advancement of members of the course, especially those from abroad.

All aspects of modern Transfusion Practice are covered including donor care and selection, donor testing, microbiology of donations, investigation of transfusion reactions and advanced serology of red cells and tissue typing. The production of antisera, including monoclonal antibody production, is a feature of the course as is the production and standardisation of anti-human globulin sera. The production of blood components and derivatives including cryoprecipitate, fresh frozen plasma, platelets, white cell concentrates are dealt with. The Centre is computerised and candidates have an opportunity to discuss such applications. The Centre houses the frozen cell bank for Scotland as well as the accredited frozen cell panels for boosting of human volunteers for the production of anti-D immunoglobulin.

TANZANIA

Dr Derek Farr, Senior Chief MLSO in the Aberdeen Centre, was one of two British experts who spent two weeks in Tanzania on behalf of the WHO, running a workshop in transfusion science at the Muhimbili Medical Centre of the University of Dar-es-Salaam. The course was attended by doctors and technologists from Zambia, Botswana, Malawi and Uganda (who were funded through the WHO by the Danish International Development Agency), as well as from mainland Tanzania and Zanzibar. In view of the severe financial constraints facing countries in this area – which nevertheless are fortunate to possess an excellent body of technologists – the main stress of the course was on the preparation of blood grouping reagents from local materials, to allow more effective use of the limited foreign exchange available and currently expended on commercial materials. As the incidence of HIV in East central Africa is from 5-25% of the population, and much of the blood collected (especially in rural areas) is transfused the same day, effort was also concentrated on the assessment and development of sensitive but inexpensive and rapid tests for HIV antibody.

TRAINING AT HOME AND ABROAD

INDIA

As an extension of Professor Cash's efforts to develop Indo/UK collaborative programmes in general manpower training and reagent manufacture for blood transfusion, Martin Bruce, SNBTS Reagents Manager, visited India at the invitation of the Overseas Development Administration.

During the two week visit, meetings were held with officials from the Government of India and the British Council in Delhi and Bombay and with staff in blood transfusion laboratories in Delhi, Chandigarh, Srinagar and Bombay. These meetings were used to gain an appreciation of local problems and appraise how best the proposed collaborative training ventures might be implemented.

EXCHANGE WITH AUSTRALIA

Personal contact between senior members of staff in Edinburgh and Perth, Western Australia, resulted two years ago in the establishment of an exchange agreement under which a member of staff of the Edinburgh and Perth Transfusion Centres each spends a year simultaneously in the other Centre.

Each fills the post vacated by the other and undertakes all the duties including out-of-hours rosters. So far the participants have been Medical Laboratory Scientific Officers but other professions are eligible to apply and may well do so before the end of the five year period which the agreement covers.

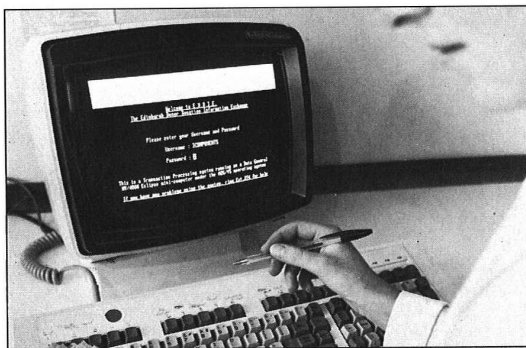
The experience has proved enriching both to the traveller and to their hosts: ideas are transferred, working methods shared and differing lifestyles experienced to everyone's advantage.



Our Australian visitor

INFORMATION TECHNOLOGY

The first development in computerisation in the SNBTS was in 1974: the introduction of a batch system for the management of blood donor records in the West of Scotland. The integrated national phase began a decade later when the Edinburgh Transfusion Centre took delivery of a Data General MV 4000 mini computer. The next two years saw the development of an on-line system covering management of the donor panel, donor laboratory services and blood banking which was fully developed by July 1987.



In parallel with the developments in Edinburgh, mini-based systems were installed in the Aberdeen, Dundee and Inverness Transfusion Centres in preparation for full computerisation. In addition a land line was established between Edinburgh and Inverness to provide the Inverness Centre with full access to the Data General system. This provided valuable experience about the use of a machine from a distance of 160 miles and assisted greatly with the development of a strategy for a national network.

By December 1988 the Inverness Centre had transferred to the full Data General system and Inverness and Edinburgh were fully committed to it, by then running on a larger, more powerful Data General Machine.

Funding for the rest of the planned network was made available beginning in financial year 1988/89. The Dundee centre will have transferred fully by the end of 1989 and Aberdeen by April 1990.

Planning is also underway to transfer to the Data General system the West of Scotland donor data, covering some 218,000 donors. This, being a transfer from another computer system, should be achieved more quickly than was the case in the other Centres where donor records had been held manually.

The hub of the network will be the SNBTS Information Technology Unit due to open in Edinburgh in July 1989. This will have land line connections to all five Transfusion Centres, the Headquarters Unit and the Protein Fractionation Centre. The computing power has been provided by relocating the original Data General machine from the Edinburgh Transfusion Centre to the Headquarters computer unit with the addition of a second more powerful system to share the increased workload. These facilities will provide a 24 hour on-line service to all Centres using a common set of programmes.

Further major expansion in information technology is being planned for the next five years. The particular areas to be targeted will be financial management, clinical audit, blood use, laboratory workload, quality assurance, storage of records and library services.

'EDDIE' (Edinburgh Donor Data Information Exchange)

RESEARCH GRANTS

The following research grants were awarded during the year to 31 March 1989

BRITISH HEART FOUNDATION

Structure-function relationships in endothelial plasminogen activator inhibitor.

I R MacGregor and N A Booth

£35,418 over 2 years

Endothelial cell binding on vascular prosthesis.

D Hamilton and N R Hunter

£40,000 over 2 years

INDUSTRIAL

Monoclonal antibodies with neutralising activity for human immunodeficiency virus.

D B L McClelland and C V Prowse

£343,000 for 3 years

Continuation of project on development and use of murine monoclonal antibodies to Gram negative endotoxin.

C V Prowse, D B L McClelland, I Poxton and

G R Barclay

£204,500 for 2 years

Intraoperative autologous transfusion using the Cellsaver 4.

K Bell and J Gillon

£12,000 for 1 year

MEDICAL RESEARCH COUNCIL

The development of human monoclonal antibodies to HIV for use in AIDS research and patient management.

K James, C V Prowse and D B L McClelland

£108,526 for 3 years

Cohort study of rheological and coagulation factors and the prognosis of atherosclerotic peripheral arterial disease.

G F Fowkes, G D Lowe and J Dawes

£88,340 over 3 years

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FINANCE

The SNBTS is specifically funded by the Scottish Office as part of the Common Service Agency's total annual allocation.

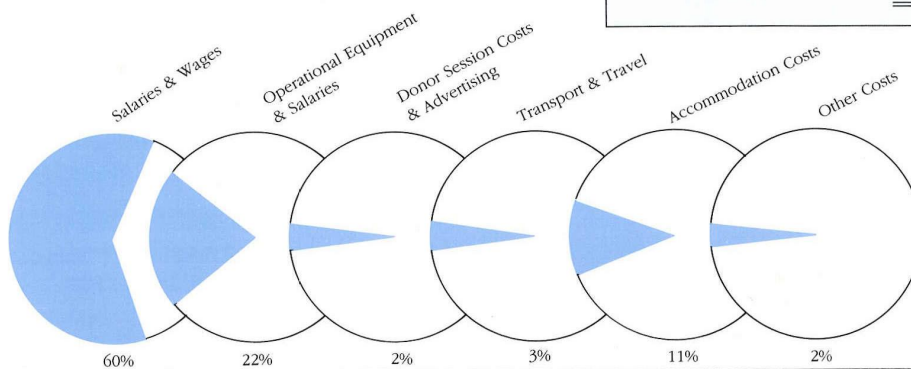
The revenue expenditure for the years to 31 March 1989 and 31 March 1988 are shown in Table 1 right:

This expenditure can be analysed into its major components as shown in the pie chart below:

Table 1 Scottish National Blood Transfusion Service Summary of Revenue Expenditure Accounts for Years ended 31 March 1988 and 31 March 1989

Description	1989 £	1988 £
1. Salaries & Wages	10,022,012	8,816,735
2. Operational Equipment	649,997	1,201,209
3. Operational Supplies	2,947,584	2,861,216
4. Transport	124,566	120,261
5. Staff Travel & Subsistence	375,372	320,334
6. Printing & Stationery	223,814	192,861
7. Advertising	234,989	141,230
8. Cleaning	145,581	113,782
9. Rent & Rates	466,406	351,161
10. Donor Session Expenses	102,826	81,029
11. Maintenance of Buildings & Grounds	203,666	192,354
12. Furniture & Office Equipment	225,193	225,694
13. Heat & Light	361,650	327,793
14. Telephones & Postage	262,400	224,056
15. Other Expenses	107,195	403,842
TOTAL EXPENDITURE	16,453,251	15,573,557

Table 2 Scottish National Blood Transfusion Service Analysis of Spend to 31 March 1989



The SNBTS also forms part of the Common Service Agency's Capital Programme. The expenditure incurred in the year to 31 March 1989 is shown in Table 3 below:

Table 3 Scottish National Blood Transfusion Service Summary of Capital Expenditure Account for year ended 31 March 1989

Description	Building Works & Fixed Plant £	Fees £	Moveable Equipment £	Total £
1. Construction of new buildings	121,598	20,500	—	142,098
2. Alterations to existing buildings	274,930	7,069	229,255	511,254
3. Purchase of equipment	—	—	994,067	994,067
4. Vehicles	—	—	115,930	115,930
TOTAL EXPENDITURE	396,528	27,569	1,339,252	1,763,349

BLOOD TRANSFUSION SUB-COMMITTEE MEMBERS

Mr D F Macquaker

Convener and Chairman CSA Management Committee

Mr J T Donald

General Manager CSA

Mr J W Duncan

Dr J M Foirrester, *SHHD* (until September 1988)

Dr R Skinner, *SHHD* (from February 1989)

Professor R H Girdwood

Dr J H Grant (until July 1988)

Dr A A Reid (from December 1988)

Mrs B M Gunn

Mr D R Harper

Mr J Hamill

Vacancy

Dr G A McDonald

Dr J F Munro

Dr G A Scott

