

SRT@ 40

A short history of the Society, Religion &
Technology Project 1970-2010

By

Dr. John M. Francis

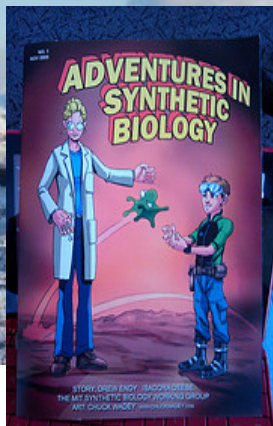
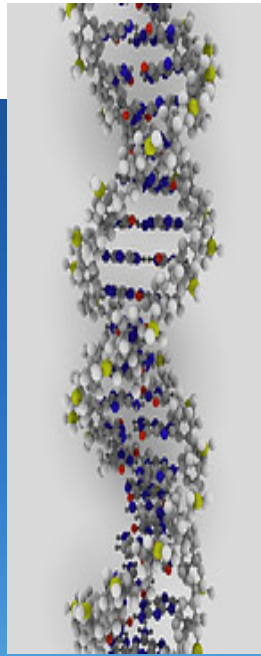
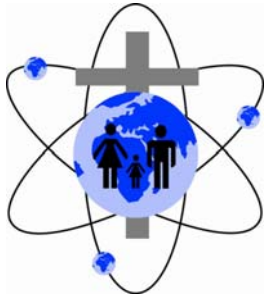


Table of Contents

Section	Page
1. <i>'Behold I am making all things new'</i>	4
2. <i>The First Steps</i>	6
3. <i>Later Phases and Developments</i>	11
4. <i>Another Turning Point</i>	14
5. <i>Mobilising the social sciences</i>	15
6. <i>Interpreting the Life Sciences</i>	21
7. <i>Interrogating the Future</i>	24
8. <i>The Next Forty Years</i>	25
9. <i>Selected Bibliography</i>	30

SRT @ 40

A Short History of the

Society, Religion & Technology Project: 1970 - 2010

1. *'Behold I am making all things new'*

It is difficult to believe that the Society, Religion & Technology Project (or SRT Project as it is more widely known) is about to celebrate its 40th Anniversary in May 2010. In responding to an invitation to write a short history of the Project, I realise that this can no longer be regarded as a relatively straightforward task. The direction of travel for the Project has been far and wide.

At the beginning of the 1990s, I wrote an Introduction to Ronald Ferguson's book *'Technology at the Crossroads – The story of the Society, Religion & Technology Project'*. The full text of the book sets out the historical time-line associated with the working contributions of the successive SRT directors over the period 1970 – 1991, and was intended to mark the SRT Project's 'coming of age'. It is still an important point of reference.

To adequately address the present task, it will be necessary to cast back to events that took place in the years immediately preceding the inauguration of the Project.

The first of these was a conference entitled *'Man in the Making of the New Industrial Society'* held at the Baird Hall, University of Strathclyde, Glasgow, on 23rd March 1968. At this conference a keynote address was given by W S Robertson, then Vice-President of the Scottish Council (Development and Industry) on the overarching theme - *'The Future of Man in a Technological World'*. This conference was attended by close to 200 people from all levels of industry and was organised by the Church in Industry Committee of the Church of Scotland Home Board. It proved to be a critically important launching pad for the initial thinking behind the SRT Project itself.

Dr Robertson gave an unflinching appraisal of Britain in the grip of rapid technological change, the pace of science-based invention and the challenges that lay ahead:

'Research by scientists is systematically amassing new stores of knowledge about matter – knowledge which is the raw material of invention. If you

then train people systematically as engineers and applied scientists – that is, as technologists – they know how to get access to these stores.’ ... ‘But even so, we are only at an early stage in this transformation to a state of new power and new freedom. The principal feature of the future will be still faster change. Computers will speed up the process of invention as well as of production because they will extend the power of organised thought. A central nervous system of computers and telecommunications will girdle the earth, and all industry will be linked to it.’

He then went on to ask ‘*Is this the Business of the Church?*’ His own reply to this question was plain and unequivocal:

‘There are those who say that this is not the business of the church. To state and answer their case would take too much time. But to clear the ground let me state my own position. To those who say that it is the task of the church to train Christians who can then act individually in their own sphere – to be in politics or industry or some other – I say that they betray a total unawareness of the situation we are in. Individuals thinking and acting separately are powerless in the face of it.’



Dr. John M. Francis

His challenge to theologians and to theological education was equally direct. He proposed the formation of ‘think groups’ so that those

‘with insight from industry and from theology – and others with insight who may belong to neither – may get to grips with each other and with the central issues of power – the power of industry, the power of the spirit.’ ...

‘To carry forward this work we need at least one technologist as a full-time staff man – someone who has been brought up in this situation and has it in his bones. Without the appointment of at least one such man, I say categorically that there is no point in forming groups.’

This argument prevailed within the Church of Scotland under the outstanding leadership of Rev Dr Horace Walker, then Secretary of the Home Board, and Rev George Wilkie, organiser of the Church and Industry Committee. Building on the original advocacy of Willie Robertson, they succeeded in persuading the wider church that this was an essential step into the future. In the autumn of 1969, an advertisement appeared in the popular weekly scientific magazine *New Scientist* seeking a director for an innovative project on ‘*Technology & Religion*’ to be sponsored by the Church of Scotland Home Board. It was a remarkable initiative by the Church of Scotland that broke new ground by creating the first project

within a church or religious community solely dedicated to an understanding of science, technology and engineering and the need to develop codes of ethics and social responsibility in associated areas of public policy. A flood of applications from across the UK was the direct result.

This announcement was accompanied by a commitment to provide the resources required to service and maintain this project, in the first instance over a three year period. Although this was seen as a slightly tentative step at the outset, the Church of Scotland has not wavered in its commitment to the Project over the subsequent 40 years. It is to the very great credit of those within the church, who over the years have taken on the responsibility for funding the SRT Project, that it continues to work along the lines of the original proposal in an interdisciplinary way to such good and lasting effect.

To cut a long story short, after a series of interviews in Edinburgh and Glasgow, I was appointed to become the first SRT director and took up the post on 1st May 1970. I had arrived with a Research and Development background in the civil nuclear power industry, having graduated at Imperial College London, completed a PhD in 1963, and then worked at the CEBG Berkeley Nuclear Laboratories. The broader base of my scientific knowledge outside the practical disciplines of physical chemistry, nuclear reactor technology and nuclear fuel element performance was about to be put to the test.

For a family with two young children in an unfamiliar setting, it was a challenge to begin to understand the nature of our new surroundings, and to begin the search for likely colleagues and partners in this venture. We were not to be disappointed on either count. The hospitality and the enthusiasm for the work ahead gave us all very great encouragement right from the start. It proved to be a most promising signpost for the future that we could follow with confidence.

2. The First Steps

A significant backdrop to the inauguration of the SRT Project is to be found in the collected papers of the 4th General Assembly of the World Council of Churches (WCC) that was held in Uppsala, July 1968. In response to the growing demands of its own world-wide constituency, the WCC had decided to embark on a 5 year study – *'The Future of Society in a World of Science-based Technology'* – that was very close to the aims and objectives of the proposed project in Scotland.

Willie Robertson was a member of the Church of Scotland delegation attending the Uppsala Assembly and he was also successful in influencing the almost parallel WCC programme about to start under the direction of Paul Abrecht, WCC Church and Society, based in Geneva. As a result, Willie Robertson and myself, together with David Edge (Science Studies Unit) and John Black (Head of Forestry and Natural Resources) from the University of Edinburgh attended the first WCC conference to focus directly on this theme towards the end of May 1970.

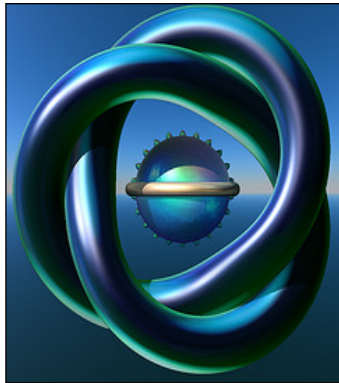
Following a remarkably high-level of discussion and debate in Geneva, Willie Robertson and others decided that it would be logical to insert 'Society' into the overall title of the Project, and at the first meeting of the Central Advisory Group in Edinburgh this was unanimously adopted. It's been long accepted that this is a rather difficult and complex title. However, it made the point about the need for more integrated thinking in these three related subject areas. Subsequently, the SRT mast-head has been retained in recognition of the true origins, identity and innovative character of the Project within the Church of Scotland.

The Society, Religion & Technology Project was definitely up and running. It was a new experience for the staff of 121 George Street to have a nuclear scientist wandering the corridors amongst them. In those early days of the SRT Project, I was dependent on the wisdom and guidance of Rev George Wilkie, without whose constant support and good judgement the project could not have been expected to thrive. By opening up his personal networks and knowledge of the Scottish economy, George Wilkie made a formidable contribution to the initial stages, and all supporters of the SRT Project over the years will continue to owe him a large debt of gratitude.

The first event in Scotland under the auspices of the SRT Project was held at Scottish Churches House, Dunblane, in the early part of 1971. It was a day-conference on the theme of *'Growth: Can Economic Growth Continue?'* There were significant contributions from Dr Robert A Smith, the first Principal and Vice-Chancellor of Heriot-Watt University, recently arrived from the USA following a distinguished career at Massachusetts Institute of Technology (MIT); Peter Jackson, Department of Economics, University of Stirling, previously a senior Treasury official involved with the management of public expenditure, and James Whyte, Professor of Christian Ethics and Practical Theology, University of St Andrews. The debate was timely and attracted a great deal of interest amongst politicians and theologians alike. All who attended agreed that this was a most promising start for the SRT Project.

Then, in June 1971, an important WCC consultation took place at Nemi, in the Alban Hills outside Rome, where the Committee on Church and Society,

chaired by a leading biologist and geneticist, Professor Charles Birch, University of Sydney, received the first stage results from the Club of Rome *'Limits to Growth'* study. Jorgen Randers, a Norwegian member of the MIT project team headed by Denis Meadows, gave an inspiring presentation that made a lasting impression on all present. Theodore Roszak, author of *'The Making of a Counter-Culture'*, was another contributor who added a valuable perspective by inviting everyone to embark on imaginative and creative thinking about these global issues. This was undoubtedly an early turning point in the ecumenical debate about the future direction of science, engineering and technology.



Limits to Growth.
Photograph by Anua22a

In March 1972 the MIT team published their initial report - *'The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind'* - to increasing acclaim from environmentalists but to considerably less enthusiasm from Government circles and others, including industrialists, merchant bankers, investment managers, i.e., those who could see a potential ideological threat to free markets looming over the horizon.

There was much academic criticism from the more orthodox schools of economic theory in the UK and USA. Controversy was undoubtedly in the air.

The second SRT day conference on *'Stability: the Search for Equilibrium'* a few weeks later took the MIT report centre stage and began to expose the working assumptions of the global model to a rigorous examination by a cross-section of academics, politicians, social scientists, theologians and ethicists here in Scotland. Despite the weaknesses in global data sets used for this computer-modelling approach – increasing population growth, production and distribution of food per capita, increasing depletion rates of natural resources including fossil fuels, industrial output per capita, pollution sources and sinks in domestic, commercial and industrial sectors – the underlying message could not be seriously disputed. The world economy and international markets in resource futures were defined as living on borrowed time.

Following this event, the SRT Project was asked by the WCC, as an officially designated international non- governmental organisation (INGO), to attend the 1st United Nations (UN) Conference on the Human Environment, Stockholm, June 1972. It was an extraordinary privilege to be present at this conference so early in the lifetime of the Project as it provided an opportunity to meet leading environmentalists, research scientists and campaigning groups, all contributing to a major international debate in the Swedish capital. For the first time, it was formally acknowledged that there was a range of environmental problems of global

significance. This UN conference provided the platform for the launch of a major piece of work on the environmental crisis - 'Only One Earth' by Barbara Ward and Rene Dubos – which has become the widely recognised benchmark for what began to take place in Stockholm. □

During the conference, the now-familiar image of the Earth seen from an orbiting Apollo spacecraft quickly became the symbol of this special gathering. Within the conference itself, important first steps were taken by UN member states to set up new institutional structures to monitor environmental changes and trans-boundary pollution more effectively. It was also proposed that the official UN environmental agency – identified as the UN Environmental Programme (UNEP) – would be established in a country of the South. The capital of Kenya, Nairobi, was then formally nominated and agreed by the member states.

These were heady days for the SRT Project as the wider environmental debate began to gather momentum, coupled with the threat of an international energy crisis hanging in the air. And related events were moving swiftly in Scotland at the same time.



Oil support vessel loading in Aberdeen docks. Photograph by Bob the Courier.

Following an unexpected intervention by a Commissioner at the 1972 General Assembly, the SRT Project and the Church and Nation Committee were asked to carry out an urgent investigation into 'the social and environmental impact of North Sea oil and gas developments on communities in the North of Scotland'. This was the beginning of another remarkable journey. Rev Norman Swan was nominated by the Church and Nation Committee as the SRT working partner

and, benefiting from his detailed knowledge and background as a former senior executive of the Burmah Oil Co Ltd, we were soon able to embark on the detailed work. This required visits to every onshore location, to existing and proposed platform-construction sites, to the many harbours with operational and planned offshore service centres and to any potential landfall associated with oil and gas-related development.

The scale of inward investment to Scotland associated with this initial wave of North Sea oil and gas development was dramatically large by any standards and directly related to the new baseline technologies of offshore discovery and exploitation. Shell alone announced that it was planning to invest £1.5 billion over the first ten years in the new province. It followed from this unprecedented scale of industrial investment, mainly by major

international oil companies, that the future impact on Britain's balance of payments, moving from a large dependency on imported oil and gas to a balance of self-sufficiency, was certain to have dramatic political consequences.

However, the indirect social and environmental costs also needed to be carefully analysed and assessed. The slender resources of the SRT Project were about to be stretched to the limit. Added to this, a world energy crisis on a unique scale was looming through the mists as OPEC (the Organisation of Oil-Exporting Countries) introduced a quadruple increase in the posted price of a barrel of crude oil. A period of rapid technological change was in prospect and Scotland found itself at the leading edge of the international oil industry. The likely conflict between the economic benefits of exploiting finite natural resources and the need to protect the richness and diversity of Scotland's natural environment was there for all to see. It would require an overall planning strategy of foresight and sensitivity to manage the way ahead.

In March 1973, the first SRT/Church and Nation report on North Sea oil and gas development – *'Scotland in Turmoil'* – was finally completed and published with many approving noises from political circles, the press and broadcasting media. The criticism in the report of local planning authorities for allowing their enthusiasm to overtake their judgement also met with some degree of official recognition by the Scottish Office. One of the results of this additional outside scrutiny was the formation of the Oil Development Council for Scotland with a Minister of State in the chair. Somewhat out of the blue, the SRT director was appointed to serve on this Council.

The Church of Scotland had secured a place at the table where some of the more difficult political, environmental and ethical decisions relating to the development of the North Sea oil and gas province were going to be taken. On reflection, this was a most auspicious start for the Project and its ongoing engagement with this key area of science and technology. Willie Robertson's vision had proved to be correct. Collective decisions of this nature would be informed by consideration of social, environmental and ethical factors that would in turn influence the final decision-making process. The hope was that this would be accompanied by increasing levels of public accountability through the Parliamentary processes at Westminster.

By and large, this is what happened. Both Scotland and the UK as a whole started to draw down considerable benefits to the national and local economies, together with the politically and economically significant balance of payments advantage, as the UK gradually emerged over the next ten years as a major oil and gas-producing region.

In some of the more remote parts of Scotland, particularly in Orkney and Shetland, new onshore industries were established, bringing increased levels of economic activity and employment associated with the offshore exploration and extraction of oil and gas, many of which survive to this day. Inevitably there were social and environmental impacts which had to be identified, carefully analysed and then successfully managed.

Overall this was no small achievement for the strategic planning process. It is worth saying that the SRT Project continued to play its part in this process over subsequent years and issued several controversial reports jointly with the Church and Nation Committee on the different aspects of North Sea oil and gas development - *'Scotland's Pipedream'* (1973) and *'Scottish Oil Shakedown'*(1974).

The early to mid-70s were therefore productive years for the SRT Project and largely determined the way of maintaining positive forward momentum.

3. Later Phases and Developments

With remarkable prescience, the WCC Department on Church and Society arranged a major conference in Bucharest the following year. It was at this conference in the summer of 1974, that the broad concept of *'a just, participatory and sustainable society'* (known as JPSS) was formulated and debated for the first time by a representative cross-section of the international community. The concept was formally outlined as follows:

'The goal must be a robust, sustainable society where each individual can feel secure that his or her quality of life will be maintained or improved. We can already delineate some necessary characteristics for this enduring society:

First, social stability cannot be obtained without an equitable distribution of what is in scarce supply or without common opportunity to participate in social decisions.

Second, a robust global society will not be sustainable unless the need for food is at any time well below the global capacity to supply it, and unless the emissions of pollutants are well below the capacity of the ecosystem to absorb them.

Third, the new social organisation will be sustainable only as long as the rate of use of non-renewable resources does not outrun the increase in resources made available through technological innovation.

Fourth, a sustainable society requires a level of human activity which is not adversely influenced by the never-ending, large and frequent natural variation in global climate.'

The significance of this statement should not be under-estimated. It was not until over a decade later, in 1987, that the UN-sponsored *World Commission on Environment and Development* under the leadership of Gro Harlem Brundtland, the former Prime Minister of Norway, began to advance the concept of JPSS in the following terms –

'We have tried to show how human survival and well-being could depend on success in elevating sustainable development to a global ethic. In doing so, we have called for such major efforts as a greater willingness and co-operation to combat international poverty, to maintain peace and enhance security world-wide, and to manage the global commons.'

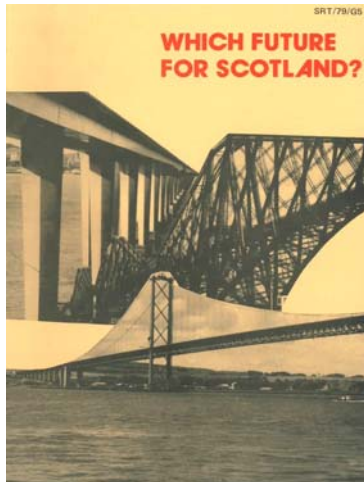
In the sense that the work of the SRT Project has faithfully pursued these aims and objectives over a period of 40 years, it could be claimed that even from its earliest days the Project has managed to stay ahead of the curve of informed scientific opinion on the urgency and growing need for action to address these issues.

Each director has injected fresh energy and ideas at each stage of the Project's development. All of this has been carefully researched and set out in Ron Ferguson's excellent book *'Technology at the Crossroads'*, and it is not possible to reiterate or attempt to summarise such a range of different approaches here.

However, there were some benchmarks which are worth mentioning because they signalled important transitions in the inter-disciplinary thinking and research that have contributed so much to the working strengths, viability and forward vision of the Project over many years. In 1974-78, corresponding to the second phase of the Project, Colin Pritchard, a chemical engineer from Cambridge University and who had previously managed Courtauld's protein food unit, took over the role of SRT director. Colin quickly initiated a *'Delphi'* study to focus thinking about sustainable development on Scotland while at the same time reflecting many larger concerns of the global community, i.e. the rising demands of many poor nations for a New International Economic Order; the shifts in power and policies to accommodate a world shortage of crude oil; the precarious state of agricultural production in many countries; and the growing burden of urban populations, especially in the developing world.

Building on an active baseline of participation in Scotland and elsewhere, Colin drew all of the strands together in the 1979 SRT report *'Which Future*

for Scotland?, incorporating the results of the earlier Delphi Study and providing an important signpost for the Scottish economy and the welfare of communities throughout Scotland. It still warrants a good deal of attention, because even in 2010 we are still a long way from adopting the goals of sustainable development into our political and economic planning.



Elsewhere, in the wake of the world energy crisis of 1973-74, there had been renewed interest in possible large-scale programmes of civil nuclear power production in many industrialised countries and elsewhere. In August 1974, the Central Committee of the World Council of Churches, meeting in West Berlin, asked for a thorough assessment by Church and Society of *"the risks and potentialities of the expansion of nuclear power"*.

The SRT Project was invited to act as principal adviser for this initiative and, after consultation with many of those involved in the international nuclear debate, it was decided to hold a Hearing on Nuclear Energy bringing together nuclear scientists, scientists from related disciplines, technologists and politicians, as well as theologians and church leaders. Professor H B G Casimir, President, European Physical Society and President, Royal Dutch Academy for the Arts and Sciences, agreed to chair the proceedings. The Hearing was held at Sigtuna, Sweden, 24th-29th June 1975, with the first SRT director acting as the Rapporteur.

The final report of the Hearing provides a range of different perspectives and many of the essential strands of public accountability relating to the various dimensions of nuclear energy, including the coupling between civil nuclear power plants designed exclusively for electricity production and the parallel technologies of nuclear weapons development. The findings were carried forward to the 5th WCC General Assembly in Nairobi where I was invited to lead several workshops to discuss the future implications of nuclear energy and its associated social, economic and environmental costs.

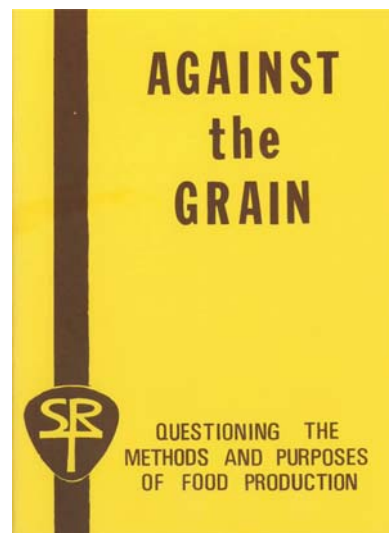
With the support of Paul Abrecht, a comprehensive book was published by the Saint Andrew Press based on the proceedings of the Sigtuna Hearing on the global expansion of civil nuclear energy – *'Facing Up to Nuclear Power'* (1976). The Sigtuna report itself was highly rated by the International Atomic Energy Agency (IAEA) in Vienna which recognised that there was an urgent need for wider public debate on the future significance of developing civil nuclear power programmes in many countries.

Subsequently the IAEA invited the WCC together with the SRT Project to take part in a landmark *International Conference on Nuclear Power and Its Fuel Cycle*. This was held in Salzburg, 2nd-13th May 1977, and the WCC paper was presented in a full plenary session of the conference on '*Public Attitudes to Nuclear Energy*'. It was undoubtedly a remarkable achievement for a church organisation to reach that point of recognition within the international nuclear technology and engineering community.

The SRT Project was beginning to exert its influence both at home and abroad exactly as Willie Robertson had predicted. Within the ecumenical family, it was also acknowledged that the Church of Scotland had taken an initiative that could be of lasting significance. The further next steps in the life of the Project would assume a critical importance in taking this contribution forward.

4. Another Turning Point

Around this point in the SRT story, in November 1978, Iain Macdonald took over as leader of the Project. Iain had been recruited from the campaigning group Action Aid where he'd been working as an active field officer in Sudan and other parts of Africa for several years. An agriculturist by training, Iain soon began to address the problems facing British farmers required by UK Government directive to restore levels of self-sufficiency to food production in the UK. No stranger to controversy, Iain Macdonald later went on to publish '*Against the Grain*' which questioned the priorities and methods of the food industries and then defended his argument at the General Assembly:



'As long as technological change continues, fuelling social change and allowing man to make moral judgments in the guise of technical decisions, the Project will have reason to continue.'

A further SRT turning point took place in July 1979 when the WCC Department of Church and Society, still under the leadership of Paul Abrecht, arranged an international gathering on '*Faith, Science and The Future*' at the Massachusetts Institute of Technology (MIT), Cambridge, USA. About 900 people converged on the MIT campus; half of these were scientists, technologists and engineers, while the other half were church leaders, social scientists, theologians and representatives from government and industry. The event was structured around four main themes:

1. The relation between science and faith as forms of human understanding and the role of faith in determining the right use of science and technology.
2. The analysis of ethical problems resulting from the present and prospective developments in particular areas of science and technology.
3. The economic and political problems relating to world resource use and distribution, and the more equitable sharing of science and technology.
4. The new expressions of Christian social thought and action, which are both attentive to the promises and threats of modern science and technology and engaged in the search for a just, participatory and sustainable society.

The SRT Project was invited to make a presentation on the transition to JPSS and duly accepted the challenge:

'... the prospects of economic recession and rising unemployment are not easily accommodated wherever they are encountered. It may prove to be much more difficult for people accustomed to a higher material standard of living to come to terms with this new circumstance. I am not confident that people in the industrialised world are psychologically prepared for the economic trauma that is to come. The churches should try and keep their collective nerve so that they can continue to offer guidance and sustenance to those feeling totally betrayed by the uncertainty of the future. A supportive and caring Church at the centre of the community will respond to that need.'

This was also a time of personal transition. On leaving the SRT Project in 1974, I'd been appointed as Senior Research Fellow in Energy Studies, Heriot-Watt University, while also working as an Associate of the School of the Man-Made Future, University of Edinburgh, with Professor C H Waddington. Then, in 1976, I moved to a post in Government administration at the Scottish Office. The downward pressures on UK public expenditure were already becoming apparent and restructuring of the wider economy was generating much uncertainty in Scotland in line with other industrialised countries where traditional heavy industries were suffering a rapid decline.

Despite the triumphalism of modern science and technology in the post-World War II era, it soon became evident that there are no utopias, scientific or otherwise. Instead there was an imperative, driven by the political decision-making of the day, to start to reconcile ourselves to the difficulties of living in an increasingly imperfect world. The political and economic pressures of those years, from 1974 to 1984, were particularly acute across the nation and Scotland was set back on its heels for a time.

5. *Mobilising the social sciences*

At the beginning of 1983, the appointment of Howard Davis to lead the SRT Project marked another important transition. On secondment for three years from the Department of Sociology, University of Kent, Howard became the first social scientist to occupy the post. He brought a range of skills that were particularly relevant to the changing economic circumstances and his focus was immediately on the nature of work, and the related problems of inequality and income distribution.

All of this was set out in a valuable forward-looking book - *'Will the Future Work?' - a joint enterprise of the SRT Project and WCC Church and Society published in 1986 - which focussed on declining industrial areas as well as the upsurge of new industries based on micro-electronics. It identified and explored ways in which church, regional and international bodies could and should make an informed and practical response to political decisions affecting large numbers of people in a time of rapid technological change.*

Around this time, the SRT Project was invited by the Central Committee to make a plenary presentation at the 6th Assembly of the World Council of Churches held on the campus of the University of British Columbia, Vancouver, 24th July – 10th August 1983. Paul Abrecht, the director of WCC Church and Society, asked me to address one of the Assembly's main working themes – *"Life, a gift of God"*:

'Every scientific advance brings with it new risks as well as new possibilities. Scientists do not hold back on discoveries, but more and more they are anxious to inform a wider public about the consequences of what they discover. The challenge to the churches is to become vigorously involved in dialogue with them, so that the power of science and technology may be harnessed in the cause of peace, the feeding of the hungry and the healing of the sick.'

In other words, scientists collectively are called on to exercise judgement and social responsibility in the applications of scientific knowledge, having regard to the impact on future generations. An increase in public understanding of the risks and benefits of new science and technology should contribute in turn to the development of public policies and more soundly-based political decision-making.

At this point the Project clearly began to address some overtly political questions, and it is fair to say that this was invariably carried out in an even-handed, analytical and scholarly way. There was also a genuinely ecumenical approach involving the other Scottish churches in a helpful and constructive manner through central advice and guidance for the Project,

together with active involvement in the various working groups that were constituted on specific topics. For example, a study group was formed in 1983 following requests from the General Assembly to investigate defence policy and the concept of nuclear deterrence from the perspective of Christian theology and ethics by engaging directly with contemporary social and political analyses.

This line of inquiry led forward to a number of important events. In the course of 1986, Howard Davis edited a significant book that was published by Basil Blackwell - *'Ethics and Defence: Power and Responsibility in the Nuclear Age'*. In his introductory chapter entitled 'Thinking the Unthinkable', Howard Davis set out the overall approach to a difficult and complex subject:

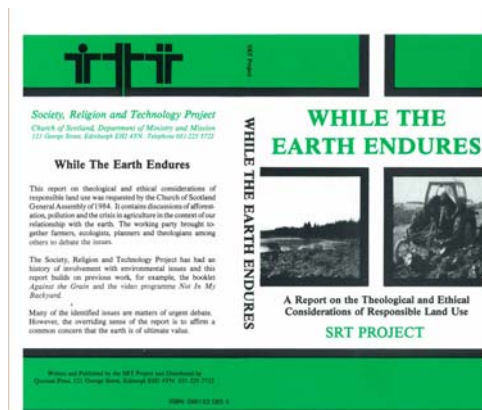
'Many of the contributions in this book are critical of present power structures but the object of the critique is not power as such. In fact, one of the dominant themes is that power is an essential aspect of human action and that neglect of a positive ethical approach to power in human affairs accounts for some of the difficulties we now face. In contrast to a number of influential social and political theories, our approach to power and power structures tries to avoid reductionism and determinism. The structures of moral action are defined by other aspects of being, which include justice and love as well as power. There is reason to believe that they can be articulated in even the most unpromising of situations. These are relationships which give us courage to say that a sense of proportion, a degree of sanity and safety can be restored to a world gripped by madness.'

This book received excellent reviews and subsequently provided the relevant themes for a conference arranged by the Centre for Theology and Public Issues, University of Edinburgh, under the directorship of Rev Professor Duncan Forrester. Following a Public Hearing on nuclear weapons and disarmament organised by the World Council of Churches in Amsterdam, November 1981, the debate had clearly moved far beyond Scotland and this formal contribution by the SRT Project to clarification of the moral and ethical dimensions of defence policy was widely recognised as being of considerable stature and relevance to the international community.

At the General Assembly in May 1984, the SRT Project was instructed to set up a working party to investigate and report on 'theological and ethical issues in land-use'. In response, Howard Davis had constituted a formidable group of people with knowledge and experience of every aspect of land-use in Scotland with Mr Charles Somerville acting as the Convener. The work was carried out over a two-year period with responsibility for

completion of the final report passing to David Pullinger, the incoming SRT director, at the start of January 1986.

During 1984, I had been appointed as Director Scotland of the Nature Conservancy Council (NCC), the Government agency charged with the introduction of new statutory duties and responsibilities for environmental conservation in Scotland under the Wildlife and Countryside Act 1981. Due to a potential conflict of interest, I was unable to take part in this working party on land-use, but we were fortunately able to secure the advice and guidance of Dr John Morton Boyd, my predecessor at the NCC. Dr Ruth Page, New College, University of Edinburgh, was also an active member of the working party and was able to bring additional insights on stewardship and the trusteeship of land, which proved to be invaluable in providing a context for the report.



The working party's final report – *'While the Earth Endures: the Theological and Ethical Considerations of Responsible Land Use'* – was duly presented to the General Assembly in May 1986 and received much acclaim and endorsement for a thorough, far-reaching and balanced assessment of this highly contentious issue. Steering a middle path on such a potentially divisive matter was a real achievement for the Project, and once again demonstrated that the Project was able to contribute

effectively to the public debate using the well-honed skills of interdisciplinary working envisaged and developed at the outset.

Although David Pullinger had been trained in computer science and information technology, he proved to be remarkably adept in turning his hand to a range of diverse subjects. Among these initiatives was a 1989 study of the science of global warming, already known as *'the Greenhouse Effect'*, describing the environmental impact of a gradual build-up of carbon dioxide and other similar gas emissions in the upper atmosphere and the associated increase in global temperatures:

'Scientists themselves differ in their beliefs about whether it is already upon us or about to be upon us, but is hard to detect. Politicians express concern but have introduced little policy that affects it. What is happening? This report is an attempt to explain what the Greenhouse Effect is, how scientists arrive at such predictions and indicate some responses to the situation.'

To say that this was the SRT Project producing a remarkable series of soundly researched and well-informed papers ahead of the curve is a masterpiece of under-statement. This was the year before the first scientific assessment on climate change was drawn together by the UN Intergovernmental Panel on Climate Change (IPCC), and a mere twenty years before the UN Copenhagen Summit (COP15) in December 2009. One of the papers in the SRT book *'With Scorching Heat and Drought'* sets out the predicament very clearly:

'If we take the middle of the 21st century as a reference point, models predict a rise in mean global temperatures of approximately 1.5 to 2.0 degrees Celsius and a 7% increase in the rate of movement of water through the cycle of evaporation, cloud formation and precipitation. However, because of the complexity of the earth's surface and the atmospheric circulation, these changes are not expected to be experienced uniformly. For example, Scotland may be up to 2 degrees Celsius warmer and receive more rainfall.'

PROFILE: DAVID PULLINGER
SCIENCE and Religion may not be the easiest of bedfellows and probably many hours are spent in acrimonious discussion. Any degree of success must surely depend on those involved understanding each other's language. David Pullinger, fluent in both "technospeak" and "theospeak"...

CRYPTOGRAM
The winner of Apple's cryptogram was Miss E. Elise... The SRT Project's approach to communication...

THE TWELVE YEARS OF TRAINING
After 12 years of training, the Trident is set to be built... The SRT Project's work on the Trident nuclear submarine...

Anyone visiting the new SRT web-site at the time would have had ready access to all of this information, and there was growing evidence of the Project's global reach far beyond the UK. It was yet another imaginative step that enabled the SRT Project to engage with the leading edge of scientific opinion. At the time it was difficult to know whether the Church of Scotland fully

appreciated the impact that the Project was starting to make amongst the wider scientific community in the UK. It is worth making the point that the Project was already contributing effectively to the public understanding and appreciation of science and technology, and this work was set to continue.

However, suddenly the Project was obliged to re-engage with an increasingly familiar subject. The planned replacement of the ageing Polaris nuclear submarines, the original carriers of Britain's 'independent' nuclear deterrent, was about to take place. A new fleet of Trident submarines was soon to be based at Faslane on the Clyde, not far from the US nuclear submarines already operating from within the Holy Loch. This involved both a considerable increase in the number of nuclear warheads associated with these 'weapons of mass destruction', and a substantial increase in the resource costs associated with the construction and operation of the nuclear-powered submarines, designed to carry the latest generation of inter-continental ballistic missiles.

It was time to go back over much of the ground we'd walked before, and David Pullinger took on this task on behalf of the SRT Project.

'Taking Out Moscow: Talking About Trident' was an innovative dialogue between a small group of informed contributors that once again brought outside attention from the press and broadcasting media and a renewed focus on the working methods of the SRT Project. The book recording exchanges that took place in the group was published by the Saint Andrew Press in 1991. It was superbly edited and fully illustrated to appeal to a wider audience. The concluding message was and still is most compelling:

'Whatever our judgements about the past and the role of nuclear weapons, the Cold War is over. Therein lies the challenge to Britain to re-think its foreign and defence policy. The question must be plainly asked: is Britain's commitment to an independent nuclear deterrent realistic in this changing world? Is this not now the time to break with our past and abandon these dangerous and irrelevant symbols of world status? They belonged to yesterday's world. Can our politicians measure up to the challenges and opportunities of these new times?'

The SRT Project had evolved considerably up to this point and yet it seemed that a shift in emphasis was now required for the Project to advance further. Important political, social and economic issues had been raised and addressed systematically over a ten-year period. Both Howard Davis and David Pullinger had made far-seeing, constructive contributions that had placed the SRT Project securely within international, ecumenical and regional networks. However, the scientific community itself was gradually waking up to the potential risks and threats of significant environmental changes.

Even the British Government in a first White Paper on the Environment *'This Common Inheritance'* (1990) had decided to incorporate the concept of 'stewardship' as the foundation of its policy:

'The starting point for this Government is the ethical imperative of stewardship which must underlie all environmental policies. Mankind has always been capable of great good and great evil. That is certainly true of our role as custodians of our planet. The Government's approach begins with the recognition that it is mankind's duty to look after our world prudently and conscientiously. ... We have a moral duty to look after our planet and to hand it on in good order to future generations. That is what experts mean when they talk of "sustainable development": not sacrificing tomorrow's prospects for a largely illusory gain today. We must put a proper value on the natural world.'

It was clear from this official statement of Government policy that the SRT Project over a twenty-year period had been moving in the right direction with its positive advocacy of the need for sustainable development, environmental protection and conservation, more careful use of finite natural resources and full endorsement of the precautionary principle when applied to all new technologies with a potentially adverse impact on people and the natural environment. With continuing support from the Church of Scotland, the Project was able to move forward and embark on the next phase.

6. Interpreting the Life Sciences

Donald Bruce was appointed to take over the SRT baton in September 1992, bringing with him a background in chemistry, nuclear safety and energy policy, and experience of grappling with difficult and complex issues through his previous employment by the UK Atomic Energy Authority. His *Postscript* to Ronald Ferguson's book outlines his vision for this forward-looking and probably most critical stage of the Project:

'In June 1992 the world's attention was focussed on the United Nations Earth Summit in Rio de Janeiro, where the world's leaders gathered to debate the environmental crisis. While disappointing in some ways, there has emerged a widespread consciousness of the need to develop our technological society to a better rhythm, sustainable for all generations, and which will not burn out before the next century is half over. This is gathered under the expression "sustainable development", which should now be allowed to permeate society at every level – not only in technology and the physical environment, but affecting wider issues of population, justice, poverty and famine.'

The Earth Summit of 1992 had also introduced and approved the United Nations Framework Convention on Climate Change, building on the earlier detailed scientific assessments completed by the Intergovernmental Panel on Climate Change (IPCC), published in 1990 and 1992 respectively. The Article 2 (Objective) of the Convention states:

'The ultimate objective of this Convention is to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.'

With all the benefits of hindsight, it's possible for us to look back at this ground-breaking international agreement, forged in the increasing heat of debate between the industrialised and the developing countries nearly eighteen years ago, and genuinely wonder why it has taken the international community so long to come to its senses.

For the Project, it was time to investigate some of the fastest growing areas of technology, namely, biotechnology, genetics and genomics, the source of so many major advances in the life-sciences. From the outset, Donald Bruce worked hard at drawing together an interdisciplinary working group on genetic engineering in animals and plants to interpret current developments and to examine the underlying ethics of the new science and technology, recognising that this field of ethics was relatively in its infancy.

His efforts were successful as he was able to bring key figures from some of the most active research groups in Scotland to join the SRT discussion. These included Joyce Tait, soon to head up the Economic and Social Research Council (ESRC) Innogen Centre at Edinburgh University, Ian Wilmut from the Roslin Institute (associated with the breakthrough in sheep nuclear transfer (i.e., 'Dolly')), and Malcolm Wilson, Scottish Crop Research Institute, Invergowrie, where a potential route for the production of vaccines and therapeutic proteins in plant tissue had been created by genetically modifying a plant virus. Professor Peter Wilson, former Scientific Director, Edinburgh Centre for Rural Research and then General Secretary of the Royal Society of Edinburgh, was also a member of the working group.

After almost five years of diligent, intensive and careful work, the working group produced its report – *'Engineering Genesis: The Ethics of Genetic Engineering in Non-Human Species'* (edited by Donald and Ann Bruce) – and this was submitted for publication by Earthscan in April 1998. It proved to be a landmark event for the SRT Project, taking its analysis and vision on to the world stage. Many of the questions raised are open-ended and will need to be kept under constant review. In a final reflection, the working group registered this ongoing concern:

'Part of the democratic process is to make visible the different options for our future, and to create structures where they can be evaluated. It is clear that genetic engineering has the potential to make a major social impact, but this study has found a serious lack of public accountability over what developments we do or do not want to go ahead. ... There is considerable public concern that decisions are made in the secrecy of commercial organisations, within committees of experts, or by individual pressure groups. While assessment needs to take account of the best scientific information, an undue emphasis on the scientific, rationalist

tradition tends to allow too little place for personal and societal values in decision-making.'

Using this platform, Donald Bruce was able to act as a strong advocate for more detailed assessment of the risks and wider participation in the decision-making process that influences the practical outcomes in this developing field of biotechnology. Consequently, he was soon in demand as someone able to address the risks, benefits and uncertainties associated with the technology, frequently crossing the globe to contribute to academic and public debates in many countries. He always made sure that the profile of the SRT Project was put centre stage in these presentations.

The fact that no other church had been able to articulate and present such a competent professional view speaks volumes for the time and energy that Donald Bruce and his colleagues on the working group had dedicated to increasing the broader understanding of the basic technology. There are no short-cuts in this process and those leading the Project at different times have continued to emphasise the importance of ongoing, thorough and rigorous interdisciplinary approaches to such complex issues affecting society as a whole.

Over the next ten years, Donald Bruce continued to make a most remarkable contribution to the ongoing debate on future trends in



Dr. Donald Bruce

biotechnology, nanotechnology and energy policy, both at a national and European level. In particular, on stem cell research and the continuing controversy over cloned embryos, he co-ordinated detailed submissions to the Government's review of the Human Fertilisation and Embryology Act, December 2005, and prepared extensive reports on these issues for the Bioethics Working Group of the Conference of European Churches (CEC). In May 2006, a major report on Stem Cells was presented to the General Assembly of the Church of Scotland on behalf of the Church and Society Council. In order to clarify the background and key aspects of the report, Commissioners were invited to participate in a

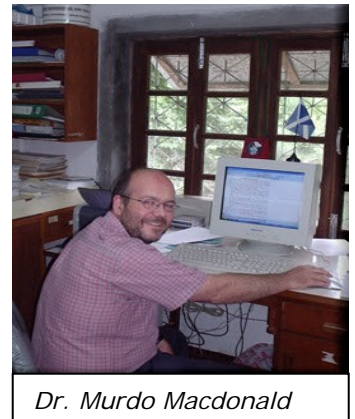
conference session with a researcher and an ethicist on the floor of the Assembly, which included a Question and Answer session on the ethical problems of creating cloned embryos for research and the possible alternative routes to using embryos for this purpose.

Despite the considerable degrees of difficulty and apparent areas of controversy, the SRT Project did not shirk its responsibilities and demonstrated once again that there is an ongoing need for the scientific community to engage directly in open discussion and orderly debate with

those who are practitioners in research at the leading edge of the new disciplines of biotechnology, molecular biology and genetics. This dialogue should include theologians, philosophers and ethicists, along with social scientists, especially those involved in making detailed risk assessments in support of public policy decisions in these complex fields of human endeavour. This will continue to be one of the main objectives of the Project.

7. Interrogating the Future

It is against this backcloth of SRT achievements over 40 years that the Project has embarked on its latest phase of development. Murdo Macdonald, a molecular biologist with medical research experience in Ethiopia and Nepal, was appointed in 2008 to take the Project forward. Now embedded within the working framework of the Church and Society Council, the Project will continue to receive funding and other support from this source and to respond to the many wider questions on the future of science, technology, engineering and economics that are identified as being of importance and long-term significance to society. The onward march of the life sciences continues to generate many challenges.



The latest of these formidable challenges to our conventional view of the world is set out in a working group report from the SRT Project on 'Synthetic Biology (SB)', which will be considered by the General Assembly in May 2010:

'Synthetic biology, as the term implies, is concerned with artificial or unnatural living organisms or life. Life or living systems is a difficult concept, especially when thinking in terms of human life. However, in the present applications of synthetic biology, life is considered in biochemical terms and is mostly concerned with some of the simplest forms of known life, such as bacteria and viruses. It is important to grasp that all life forms are composed of molecules (e.g. proteins, sugars, DNA, RNA, lipids), which are in themselves non-living. These molecules are sometimes referred to in synthetic biology as "bioparts". The biochemical definition of life is that of such bioparts assembled within a physical container (i.e. the bacterial cell wall) which are able to continually regenerate, replicate and evolve.

Synthetic biology brings together the two disciplines of biology and engineering and is essentially about the redesigning and reassembly of biological systems, in other words redesigning life. It is about the modifying of present life forms or the creating of new life forms. The biologist wants to understand living systems better and the engineer wants to create new things. While synthetic biology may be seen as a further development of "genetic engineering" which has given us genetically

modified (GM) crops, human growth hormone and human insulin, the key difference is the application to biology of techniques which are used in engineering design and development'

This takes me right back to the theological premise which determined the future pathway for the Society, Religion and Technology Project in 1970, as described by W S Robertson and his visionary colleagues – *'Behold I am making all things new'*.

In the development of the natural sciences, it has become self-evident that the life sciences - from biology and genetics to biochemistry and molecular biology - have assumed the mantle of leadership from the orthodoxies of physics and chemistry, the main disciplines which had largely dominated scientific progress and industrialisation throughout the greater part of the 20th century.

In February 2009, the scientific community celebrated the 200th anniversary of the birth of Charles Darwin. However, there are still those who will not recognise that, with his ideas on natural selection and theory of evolution, Charles Darwin toppled Isaac Newton from a pedestal of established wisdom on the laws of gravity and motion. Similarly, although Albert Einstein and his contemporaries moved our scientific world-view into a threatening nuclear age with all of its consequent risks and uncertainties, the present generation of scientists, engineers and technologists could conceivably develop a capacity within our industrial and medical institutions to progressively overcome endemic disease and to release the full potential of human resources. Such is the nature of progress and the creation of reliable knowledge. We have to travel hopefully in this direction as an act of faith in the future.

The SRT Project retains a distinct identity within the European churches to explore and investigate the complex matrix of new science and technology in order to achieve a wider appreciation and understanding of the opportunities, the risks and uncertainties, and indeed the potential threats that lie ahead of us, provided that the technology is carefully and sensitively regulated by ethical codes and standards. The critical path will depend on whether this approach can be widely recognised and applied under the auspices of international agencies, such as UNESCO, which have a global responsibility to maintain regulatory systems and global institutions and, at the same time, are prepared to uphold the precautionary principle.

8. The Next Forty Years

In March 2009, the Government's Chief Scientific Adviser, Professor John Beddington, set out some important benchmarks for the future during a lecture at the Royal Society of Edinburgh. His basic assumption was that the world population would rise from 6 billion in 2010 to 8 billion people by

the year 2030. As a result of this inevitable population growth, there will be corresponding demands for food, water and energy, all of which must be addressed urgently by the international community. In broad terms, these demands will be as follows: a 40% increase in global food production, a 30% increase in water supply coupled with freedom of access to clean water resources, together with a 40% increase in energy generation and distribution over this period.

When viewed against the broader scenario of *'limits to growth'*, including finite natural resources and the problems of ecological sustainability, it seems unlikely that any of these demands can be met by technological innovation alone. An unparalleled degree of optimism would be needed to advance such a prospect. This is the clear and unequivocal message from within the informed scientific community.

At the UN Climate Change Conference in Copenhagen in December 2009, it was accepted that any actions immediately taken by UN member states to further control their levels of carbon dioxide and other greenhouse gas emissions would not have a significant impact on the global climate system until after the year 2030. This is attributed to the recognised inertia of the biosphere in gradually adjusting to any preferred set of boundary conditions limiting greenhouse gas emissions. The latter has still to be negotiated, agreed across the international scientific community and endorsed by the IPCC (Intergovernmental Panel on Climate Change). Hopefully, this would be further strengthened by a formal UN treaty embracing the majority of member states, an enforceable international code of practice or some other innovative form of legally-binding agreement. Much work on this front will be required over the year ahead.

Such an agreement would be a clear demonstration of inter-generational responsibility. It is clear that we should act now, on the basis of existing scientific knowledge, to prevent as far as possible further incremental environmental changes that would be seriously deleterious to the living conditions of a large proportion of the world's population. This would represent an appropriate enactment of the precautionary principle, which in turn could be effectively underpinned by a practical code of environmental ethics.

It is worth reminding ourselves that the precautionary principle is already enshrined in European environmental law. In essence, this principle ensures that in the absence of substantive and reliable scientific evidence on the environmental impact of a process, activity or substance, the protection of the environment should always be the primary concern. Further to this, the law states that there is no need to wait for conclusive scientific proof before any necessary or preventive action is taken in the public interest. The keyword here is 'anticipation' and this has been the watchword of the SRT Project's success over the years. It will remain so under the present leadership.

The SRT Project therefore still has much work to do building on earlier contributions, grappling with the difficult and complex issues of modern medicine, human genetics and the rapidly developing field of synthetic biology. The overall objective remains in place, namely, to clarify and extend the public understanding of science and technology while working alongside theologians and ethicists in a genuinely interdisciplinary way.

The next forty years of the SRT Project will chart new waters and break fresh ground. That much is clear. However, there is still much work to do on scientific and technological issues of public concern. Over the years, the Project has developed the persona of *'a critical friend'* in relation to research and development on many fronts. This role should be further explored and extended in order to restore public confidence in the scientific enterprise and the attempt to find urgent practicable solutions to the many problems of food, water, energy and the environment.

On behalf of all the former directors, I congratulate the Project on the broad span of its aims and objectives and the ongoing active engagement with those at the leading edge of the scientific research community. In 1991 I wrote about the SRT Project as *'coming of age'*. In 2010 it is time to speak of maturity of vision and hope for the future.

Back in 1975, the Project staged a multi-media production at the Netherbow Theatre, Edinburgh, under the title - *'The Future Now'*. This was an attempt to illustrate by means of dramatic word, music and image, the complexity of processes and events shaping the future of our society. In many ways this was both an encouraging and a realistic piece of stocktaking as it ranged across the full spectrum of social, economic and environmental issues constituting our global future. It was an attempt to raise relevant questions about the morality and ethics of public policy decisions needing to be taken in order to advance the WCC concept of *'a just, participatory and sustainable society'*.

We are now much further along that road. Our detailed understanding and appreciation of the likely scale and impact of these global issues has increased significantly over the intervening 25 years. And yet, despite this increase in reliable scientific knowledge, we are still only reaching the threshold of actions that require to be taken now in order to yield the necessary significant benefits in 30 to 40 years time.

The SRT Project will continue to draw attention to the urgency of these actions and to the supporting ethical framework for decision-making in these difficult times of resource scarcity and competing priorities. Over the past 40 years the identity and purpose of the Project has been subject to periodic review and re-examination. However, it remains a key component of the work of the Church and Society Council. In a wider international context, it is still the only major reference point within the ecumenical family solely dedicated to considering the future directions of science, engineering and technology.

Many of the issues that have occupied the SRT Project from the outset, including the future role of nuclear energy and ongoing risks to the global environment, will continue to dominate the UK public policy agenda. The vision of the Church of Scotland in first creating the Project and then sustaining the effort over 40 years has been fully justified. In this new era of recognisable and potentially extensive global environmental change, the SRT Project is a signpost to the future that will continue to be needed.

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Society, Religion and Technology Project

www.srtp.org.uk

Church and Society Council

Church of Scotland

121 George Street, Edinburgh EH2 4YN

Email: srtp@cofscotland.org.uk

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