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# Journal of Technology, Theology, & Religion

**All Things New:  
A Brief History of the First Forty Years of the Church of  
Scotland Society, Religion and Technology Project,  
1970-2010**

**John M. Francis and Murdo Macdonald**

<http://www.churchofscotland.org.uk/councils/churchsociety/cssrtp.htm>

## **All You Need Is Love**

May 1970: Having assured us that “All you need is love.” the Beatles were in the process of an acrimonious break- up. The north tower of the World Trade Centre and the New English Bible were both nearing completion. The abortive Apollo 13 mission had been brought safely back to earth, the first commercial flights of a new generation of

super airliner, the “jumbo jet,” had recently taken place. The Nuclear Non-Proliferation Treaty, designed to limit the spread of nuclear weapons, had just come into effect.

The world was a very different place in 1970 to the one we know now. Science and technology have had enormous impacts on all aspects of human life, in many cases changing the way we think of ourselves and society. Most of these impacts have been positive; some have had unforeseen consequences. Many have raised ethical and moral questions as to how and where technology can and should be applied to benefit the largest number of people.

The Society, Religion and Technology (SRT) Project of the Church of Scotland was inaugurated on 1<sup>st</sup> May 1970. In the subsequent 40 years the SRT project has sought to help the church engage with ethical issues in relation to science.

## **New beginnings**

### 1. *‘Behold I am making all things new’*

To adequately understand the thinking which led to the establishment of the SRT, it is necessary to cast back to events which took place in the years preceding the inauguration of the Project in May 1970.

The first of these was a conference entitled ‘Man in the Making of the New Industrial Society’ held in Glasgow in 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. Dr Robertson gave an unflinching appraisal of Britain in the grip of rapid technological change, the pace of science-based invention and the challenges which 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.

There are those who say that this is not the business of the church. .... 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.

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.

Building on the advocacy of Willie Robertson, they succeeded in persuading the wider church that this was an essential step into the future. Thus, 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 and Religion’ to be sponsored by the Church of Scotland Home Board. It was a remarkable initiative by the Church of Scotland which 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.

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.

Dr John Francis was appointed to become the first SRT director and took up the post on 1<sup>st</sup> May 1970. Dr Francis had arrived with a Research and Development background in the civil nuclear power industry; he has been followed in this position by a number of people from varied backgrounds.

## *2. The First Steps*

A significant backdrop to the inauguration of the SRT Project is to be found in the papers of the 4<sup>th</sup> General Assembly of the World Council of Churches (WCC) which was held in Uppsala, Sweden, in 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’ – which 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 John Francis 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. The Society, Religion and Technology Project was definitely up and running. It was a new experience for the staff at the Edinburgh headquarters of the Church of Scotland to have a nuclear scientist wandering the corridors amongst them.

The first event in Scotland under the auspices of the SRT Project was held in Dunblane in early 1971. It was a day-conference on the theme of ‘Growth: Can Economic Growth Continue?’ There were significant contributions from academics, scientists, economists, atheists and theologians. 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.

In June 1971, a WCC consultation took place at Nemi, Italy, where the Committee on Church and Society, chaired by a leading 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, and Theodore Roszak, author of *The Making of a Counter-Culture*, were among the contributors who added a valuable perspective by inviting everyone to embark on imaginative and creative thinking about these global issues. This was an early turning point in the ecumenical debate about the future direction of science, engineering and technology.

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, who could see a potential ideological threat to free markets looming over the horizon. There was also much academic criticism from the more orthodox schools of economic theory in the UK and USA. Controversy was 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 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 1<sup>st</sup> 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. 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, 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.

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

At the 1972 General Assembly (the highest decision-making body of the Presbyterian Church of Scotland), 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.' Rev Norman Swan was nominated as the SRT working partner and, benefiting from his



detailed knowledge and background as a former senior executive of the Burmah Oil Co Ltd, the SRT was soon able to embark on the detailed work.

The scale of inward investment to Scotland associated with this initial wave of North Sea oil and gas development was large by any standards and directly related to the new baseline technologies of offshore discovery and exploitation. However, the indirect social and environmental costs also needed to be analysed and assessed. Added to this, a world energy crisis on a unique scale was looming as OPEC (the Organisation of Petroleum 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 apparent. 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 completed and published with many approving noises from political circles, the press and broadcasting media. When the UK Government formed the Oil Development Council for Scotland with a Minister of State in the chair, the SRT director was appointed to serve on this Council- a remarkable accolade for a church project in this context.

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. 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 which 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 UK 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. 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).

### *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 significance of this 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, 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.

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. 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, which still warrants attention, because even more than 3 decades later we are 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 WCC, meeting in West Berlin, asked for a thorough assessment 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 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.

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 5<sup>th</sup> WCC General Assembly in

Nairobi where there were 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 book was 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.

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, Austria, in 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 which could be of lasting significance.

#### 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 of the Church of Scotland: "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.

By 1976, 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.

##### *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 which 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.

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 which were constituted on specific topics.

In 1986 Howard Davis edited a significant book which 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.

Following a Public Hearing on nuclear weapons and disarmament organised by the WCC in Amsterdam, Netherlands, 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 Church of Scotland 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. The working group included Dr John Morton Boyd, Scotland Director of the Government agency the Nature Conservancy Council (NCC). Theologian 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 Church of Scotland's 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.

David Pullinger, the incoming SRT director at the start of January 1986, had been trained in computer science and information technology, and 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 understatement. 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 21<sup>st</sup> 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.

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 which 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 which the Project was starting to make amongst the wider scientific community in the UK. The Project was already contributing effectively to the public understanding and appreciation of science and technology.

However, the Project was obliged to re-engage with an increasingly familiar subject. The planned replacement of the aging Polaris nuclear submarines, the original carriers of Britain's 'independent' nuclear deterrent, was about to take place. A new fleet of Trident submarines was to be based on the Clyde. 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 which had been 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 which 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 which took place in the group was published by the Saint Andrew Press in 1991. 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 which 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.

## *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 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 groundbreaking 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 somatic cell nuclear transfer technology, which resulted in ‘Dolly the sheep,’ the first cloned mammal), 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’ published 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 which influences the practical outcomes in this developing field of biotechnology.

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 which 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 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 continues 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 which 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 was considered by the General Assembly of the Church of Scotland 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 us 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.’

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 which 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 UK 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.

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 (Inter-governmental 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 which 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.

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 which 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 of the Church of Scotland. 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 which 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 which will continue to be needed.

From its inception, the SRT Project has been involved in informed debate with many interested parties: government, regulators, industry, scientists, the church, the general public. The variety of publications which have resulted from the work of the SRT Project stand as eloquent testimony to the dedicated work of many people over the years, and many individuals have been stimulated to think – and to act – through the work of the project.

Through its 40 years, the SRT has tackled many different areas: from nuclear power to stem cells, economics to agriculture. Through careful and considered deliberation, much of the output from the SRT project has been through published reports; many conferences have also been organised, and more recently blogs have been initiated. The responsibility, and the concern, of the many people who have been involved



in the project has been to understand what matters to God and to people, and to determine how best to positively impact society.

The prescience of the Church of Scotland in establishing the SRT project all these years ago has been widely applauded. While not wishing to rest on our laurels, it is sometimes good to look back and to celebrate the achievements of the past. However, a number of issues remain on the horizon, for future consideration. A degree of “futurology” may be required in identifying what will be the specific subjects which will be important in the years to come, but as the SRT project looks towards the future, it is clear that much work remains to be done, and that much wisdom and prayer are still required.

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