#### SCIENCE, PEOPLE & POLITICS [ISSN:1751-598X]

ISSUE FOUR(OCT-DEC) 2017

# ANTARCTICA

112

Picture Credit: Martin Redfern©

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Helen Gavaghan, Executive Director of Science, People and Politics Ltd. Co No 0590-1911. 20th January, 2018.

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#### We enable, inform, provoke and engage

# **NEWS**

# Precision control of organic chemistry

By Helen Gavaghan

With infrared lasers, organic chemistry reactions can be driven to increase product yield. Those reactions can be managed to create tailored, three-dimensional lithographically-deposited structures. Then from analysis of spectra absorption, likely transition states of bimolecular reactions can be inferred. Further, deduction is possible about the most significant molecular vibrations to tweak by laser to drive the chemical reaction more precisely. More confidence in the results and methods will require time resolutions greater than the 350 femtosecond resolution which was available to the multinational groups reporting their work today (1<sup>st</sup> January, 2018) in Nature Chemistry.

The researchers and authors of this work, seven of them, come from Frei Universität Berlin, the University of Cairo and the University of Rostock in Germany.

Prior to these results only IR excitation of unimolecular reactions had been reported as successful. One of the bimolecular reactions explored and described in the work involves cyclohexanol and phenylisocyanate, which result in cyclohexyl-carbanilate (urethane). The urethane can polymerise to become polyurethane.

The paper carries a schematic of the reaction and the infrared excitation of the reactants moving into the transition state.

What is happening is that IR at vibrational energies above the reaction activation temperature excite certain vibrational modes, which tip the transitional state reactants to a point where thermal energy drives them to produce product, and the whole process happens more rapidly than if the IR radiation were not used.

While the reaction is more rapid than without IR, the quantum yield is low, and the authors hypothesise that polar radiation might be more precisely matched with the conformation (3-D) shape of the molecules in solution in the transition state. The authors report also that the nature and proper understanding of the solvent within which the reactants are placed is critically important for control of reactions driven in this way.

To be sure they were not observing a multi-photon effect, the group broadened their beam focus.

What this research reports is the potential of high-precision, directed bimolecular organic chemistry. The work could, the authors think, reduce the cost of laser-based fabrication.

The authors observed a 24 percent increase in reaction rate, accompanied by a negligible increase in sample heating.

"We subsequently used IR-driven reaction acceleration to write a polyurethane square on sample windows using a femtosecond IR-pulse," write the authors.

Nature Chemistry. Advance online publication 1st January, 2018. DOI:10.1038/NCHEM.2909

# Antarctica in the 1980s: A conundrum for our times

#### By Helen Gavaghan

In the 1980s geopolitics turned its attention toward Antarctica's future. Governed by the Antarctic Treaty System (ATS), the continent's unfolding history was reaching a critical marker. Twelve nations had in 1961 signed a Treaty turning the frozen continent into a demilitarised, nuclear-free zone of peace and science. After 30 years the treaty was, by the terms of the 1961 accord, to be reviewed. 1991 was fast approaching. Globally nations clamoured to influence and control what would happen next.

At the focal point of this debate in the UK in 1989 was the Antarctic Minerals' Bill, which was intended to enable ratification of the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA)<sup>[1]</sup>.

Completed in 1988, CRAMRA has, in fact, never been ratified, even though 19 nations signed their name to its negotiated conclusions. Gathering dust now in New Zealand, this convention had by 1989 become the legal instrument intended to control and regulate exploitation of Antarctic mineral resources in a way which would safeguard the environment. But CRAMRA was beginning to lose favour internationally.

What better reason could there be for a debate in the UK House of Commons? A move which gave CRAMRA opponents, doubters and supporters an archived, legally-sanctioned and Statebacked platform on which to air contested and globally critical issues. What they said one night in July 1989 is a useful primer and guide to further historical research.

Though the Antarctic environmental and political debate has moved on in the nearly 30 years since then, the lineaments of the arguments which UK politicians deployed still has resonance. And, for British and other citizens of the EU or Member States of the Council of Europe, be they pro or anti-Brexit, there is added intrigue. Namely that among the most vocal in a debate which was lost, though the battle eventually was won, was one Jeremy Corbyn<sup>[2]</sup>, now leader of Her Majesty's opposition in the House of Commons. He was (and is) the Labour MP for Islington North. Aged 40 at the time, Mr Corbyn had been an MP for five years. A rebel within his own Party, he was and is from the Labour Party's left. Mr Corbyn remains an independent thinker, and holds views which speak to younger people in the UK. He was not then, as he is now, a "Rt. Hon.". If you do not know the British system of government, the "Rt. Hon." means Mr Corbyn is trusted by the British State in its full Sovereignty.

Let us step back, then, to the 1980s, and meet the younger Mr Corbyn, not yet a Glastonbury popstar. Here, lifted from the pages of Hansard, are some of Mr Corbyn's words and views, and those of his opponents, distinguished colleagues, and explorers and activists such as Greenpeace, and scientists, seeking the ear of or to speak in the UK's House of Commons.

## **FEATURE:** Antarctica

#### Dateline: Westminster, 17<sup>th</sup> July 1989.

(These are the days before cameras were allowed in to The House of Commons.)

Shortly before 11pm on 17<sup>th</sup> July 1989, Tam Dalyell <sup>[3]</sup>, MP for Linlithgow, stood in the House of Commons as it debated the measures which would enable CRAMRA to be ratified, and asked,

#### "Who, physically, is to keep out unwelcome intruders in the Antarctic?"

It was a good question then. It is a good question now.

Tam Dalyell died in January this year. He had a way of stating and asking the obvious. So significant were some of Mr Dalyell's questions that it was not always clear to others he had spotted what was, in every sense of the word, the "Elephant in the Room". He may not have known the species, or the elephant's health, but he knew it was an elephant. He was not deluded, or commonplace in his thinking, and he understood the House of Commons.

Exactly how important Mr Dalyell's question was and is can be gauged by considering the big geopolitical pictures of the day. The mis-en-scene stemming from the late 1970s to 1980s, which made Sovereignty and responsibility for defence of landmasses and marine real estate important also had implications for Antarctica. There, by Treaty, contested Sovereignty issues were suspended. Nor did all nations claim territory in Antarctica, even those who have become Signatories to the Treaty which governs activity related to the continent. Many of those countries held - and hold - global influence. This context matters to the CRAMRA debate in the Commons in July 1989.

#### THE TERRITORIAL CLAIMS IN ANTARCTICA

Take the US, for example: it neither claims nor refutes a claim to territory in Antarctica.

The United States Department of State asserts on its website,

"Seven countries (Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom) maintain territorial claims in Antarctica, but the United States and most other countries do not recognize those claims. While the United States maintains a basis to claim territory in Antarctica, it has not made a claim." [4]

Leaving options open makes sense if a nation has the means to defend its territory, or could be hurt by action in territory where no claim has been made, even as the basis of the claim has been developed.

In the years before and during CRAMRA negotiations, oil and energy security were critical issues. In that world, accidental Nuclear War was a real threat, and ideological battles brought some of the signatories to the Antarctic Treaty into conflict in other parts of the globe. For example, when Iranian students broke into the US Embassy in Teheran, and took American hostages in late 1979, the USSR opposed US efforts in the UN Security Council to impose sanctions in Iran. All of the hostages were not released until 1981. At the time Ayatollah Khomeini had returned from exile, and the Islamic Revolution had succeeded. It was the exiled Shah's presence in the US for medical treatment which had sparked the assault on the US Embassy in Teheran.



#### Picture credit: Martin Redfern©

**Caption:** The Antarctic Peninsula is like the canary in the coal mine. It gives early warning of the consequences of climate change. Here scientists from the British Antarctic Survey set off in a helicopter to collect soil sample from remote islands off the Western side of the Peninsula so that they can study bacterial activity. **MR** 

During this same timeframe the USSR, in early 1980, annoyed the whole Islamic Conference by a massive invasion of Afghanistan, and imposition of a Communist regime. The US imposed sanctions on the USSR.

"Sales of high-grade American technology were suspended. Soviet fishing privileges in American Waters were curtailed. There was to be an immediate embargo on the sale of seventeen million tonnes of grain to the Soviet Union, the next sale that was due. To compensate American farmers who were selling the grain, the American government bought it up. The other main grain-exporting countries, including all the EEC countries\*, agreed not to make up the shortfall. Despite American pressure, one of the boycotting States, Argentina, reopened its grain markets to Soviet purchase within a matter of months."<sup>[6]</sup>

Move forward a few years, and the conflict was between Argentina and the UK over The Falkland Islands. Astonishingly through all these vicissitudes the combatants have left Antarctica as an oasis of peace. It is as if they believe their own rhetoric laid down in the Antarctic Treaty that it is a continent which should be kept free of international discord for the benefit of all Mankind.

\*There were 9 EEC members at the time.

# FEATURE: Antarctica

In parallel with these world affairs, the growing number of Contracting Parties to the Antarctic Treaty, via participation in consultative meetings, developed mechanisms for governing activity on Antarctica.

Unsurprisingly, given the energy security backdrop of the 1980s, countries examined how to defend against mineral exploitation on Antarctica. Contracting Parties to the Treaty (see box) agreed to CRAMRA in Wellington, New Zealand on 2<sup>nd</sup> June 1988. Future historians will need to decide, but from debate in the House of Commons in July 1989 it seems CRAMRA genuinely had the intent of preventing rather than enabling rapacious exploitation of Antarctica. It is just that by then other options for attaining the same aim were being tabled.

These alternates to CRAMRA gained impetus soon after the July 1989 Commons debate, which was the report stage of the Antarctic Minerals Bill. Even as MPs debated amendments and meaning of words, such as "damage", "prospecting" etc... the international mood was refocussing. Within months of Tam Dalyell's question everything changed. In Paris between 9 and 20 October, 1989, the fifteenth Antarctic Treaty Consultative Meeting agreed to hold a special meeting on the Environment in Santiago de Chile in November, 1990.

That would have been salve for Jeremy Corbyn, who said during debate on 17th July, 1989, "I wish the House were being televised now. Many people outside the House would be horrified that the House was about to agree a badly drafted Bill which will allow not only further exploration but prospecting minerals in the Antarctic."

The Year Book of Australia<sup>[5]</sup> records that by May 1989 Australia had already changed its mind. In late summer 1989, Australia said it would work with France to champion a comprehensive Environmental regime for the Antarctic Treaty. Though the Australian announcement was on 18<sup>th</sup> August, 1989, the debate in the Commons makes clear this stance by Australia and France was known.

What emerged eventually from negotiation and diplomacy was the Protocol on Environmental Protection to the Antarctic Treaty, which came into force in 1998.

Its essence is stated in Article 2: Objectives and designation.

"The Parties commit themselves to the comprehensive protection of the Antarctic environment and dependent and associated ecosystems and hereby designate Antarctica as a natural reserve, devoted to peace and science."<sup>[4]</sup>

That eventual outcome was far from clear as members of Parliament debated into the early hours from 17th to 18th July, 1989.

These were the days when Margaret Thatcher was the prime minister. A number of the speakers will be familiar to British readers, who will not be surprised that Mr Dennis Skinner (Bolsover) became distracted by the government having demonstrated its untrustworthiness by giving Hong Kong away, that he injected comments like "Yuppie prospectors" into the debate, and bemoaned the fate of birds in Felixstowe. The deputy speaker reminded members the topic was Antarctica.

Mr Peter Hardy (Wentworth) said he agreed with Greenpeace that the Bill was flawed. He cited a

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letter from Sir Peter Scott saying that the Bill's effect would almost certainly be to facilitate the despoliation of Antarctica. Both France and Australia, he told the House, have said they would rather Antarctica were designated as a Wilderness Park. "I applaud their bold initiative and sincerely believe a Wilderness Park, with a permanent moratorium on mineral exploitation, is the only way to ensure the Antarctic Wilderness is protected." he said.

In his speech and interventions Jeremy Corbyn raised concern about pollution at scientific bases, queried whether data were really being shared as they should be among signatories to the Treaty (See Box for the view that The Antarctic Treaty arguably has in mind sharing of data beyond only those who have acceded to the Treaty) and demonstrated considerable competence and grasp of "green" issues and science, ranging from his point that a proper examination of ice would reveal important planetary history. This was a speech with plenty of historical detail, awareness of whaling and fisheries, and it demonstrated feeling for biological beings other than human.

Perhaps this debate and the others which accompanied the Bill through its readings and Committee stages helped to generate the international impetus that led to the outcome from the 15th Antarctic Consultative Meeting and to the Protocol on Environmental Protection of the Antarctic Treaty. Certainly MPs aired all the fears that the unintended consequences could be damaging commercial mineral exploitation of Antarctica – a continent which is much more in the history of the World than simply its last great wilderness.

And the answer to Tam Dalyell's question? Well, no-one has come up with an answer yet.

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1. CRAMRA https://www.mfat.govt.nz/en/about-us/who-we-are/treaties/convention-on-the-regulation-of-antarctic-mineral-resou rce-activities/ 2. Rt. Hon. Jeremy Corbyn MP Accessed 15<sup>th</sup> December 2017 Tam Dalyell Obituary 3. Accessed 15<sup>th</sup> December 2017 US Department of State 4. https://www.state.gov/e/oes/ocns/opa/c6528.htm Accessed 31<sup>st</sup> December,2017. 5. Australian Year Book (digitized by Google) https://books.google.co.uk/books?id= PD0NBiCUL8C&g=ATCM#v=onepage&g&f=false Accessed 31 December, 2017. Gilbert M. (1999). Challenge to Civilization, a history of the 20th century (1952-1999) Volume III. Harper Collins 6. Publishers.

7. This article also draws heavily on copies of relevant parliamentary debates sent to me by Mr Tam Dalyell via *New Scientist*, where I was on staff in London and Washington DC from 1984 until 1991.

#### BOX 1: THE ATS [ANTARCTIC TREATY SYSTEM]

The heart of the Antarctic Treaty System (ATS) is the Treaty itself, which entered into force in June 1961.

Article one of the Treaty says it all: "Antarctica shall be used for peaceful purposes only". In the preamble the authors make clear their view is that maintaining Antarctica free from international discord is in the interests of all Mankind. Continued on page 10

Caption and photograph by Martin Redfern©: A lone Adelie penguin watches the early morning sun from icebergs off Rothera Point on Adelaide Island in Antarctica.

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The second article says that freedom of scientific investigation shall continue in Antarctica. Though open to all members of the United Nations to accede to the Treaty, the cost of entry is not trivial. There must be significant interest in Antarctica, demonstrated either by establishing a research station on the continent, or mounting a scientific expedition.

Importantly, though, scientific results are to be exchanged and made freely available. As such entry to the club is not barred by lack of knowledge.

An interpretation of the requirement to make data from Antarctic research freely available has always been that the intent is for scientist to share Antarctic data not only among those who have been in Antarctica. That conclusion is because the Treaty sets up the International Geophysical Year (IGY) of 1957-58 as an example for model behaviour. An essential part of the IGY was the World Data Centers, in which all parts of the IGY, a global exercise, were to deposit their data for access open to all. The World Data Centers transcended all political divides of the time. They were very forward thinking.

But what of the environment? As the main article makes clear, ensuring the scientists and scientific stations did not damage the environment as a result of their activities on Antarctica had become a matter of concern for politics, activist and the public. It was not only fear of commercial oil and mineral exploration on and around Antarctica which drove Jeremy Corbyn and his colleague to their feet during parliamentary debate in 1989. Eventually, environmental concerns were assuaged by the "Protocol on Environmental Protection to the Antarctic Treaty". That protocol is knit together by the Treaty itself. It was signed in 1991, entering into force in 1998.

Prior to that, the initial signatories of the Antarctic Treaty had signed two conventions:

The Convention for the Conservation of Antarctic Seals (1972); and The Convention for the Conservation of Marine Living Resources (1980).

As the main article reports, the Convention on Antarctic Mineral Resource Activities, though agreed in 1988, was never ratified.

#### The original signatories of the Antarctic Treaty in 1959 and their world

Each nation signing the Antarctic Treaty was then vying, and for different reasons, for hegemony internationally and/or regionally.

The backdrop of their world comprised: emergence from global war; reconstruction of infrastructure, economies and global trade; emergence of the atomic age; transition to the East-West battle between the US and USSR for global hegemony in defence of their own political systems and economic integrity; and the beginning of the end of European Colonialism, which, in some cases, had its roots pre-WWII.

On that World-Wide canvas each of the original signatory nations\* made different Sovereignty claims, or used, without claiming Sovereignty, the continent of Antarctica in pursuit of their national interest.

Even had the United Nations in the late 1950s been strong enough to handle defence and management of a vast unoccupied Continent - *terra nullius* - it is hard to see the US, USSR, UK,

#### FEATURE: ANTARCTICA

Argentina and Chile, with their then respective points of contention and unresolved global issues, from The Beagle Channel dispute to the dollars versus roubles versus sterling battles, being able to work together within the UN system. Certainly, Argentina and Chile had each independently refused to accept the authority of the UN's International Court of Justice in the context of their respective Sovereignty disputes with United Kingdom.

Though science and the environment have reaped the benefit of the Antarctic Treaty, as can be seen in its ensuing legal instruments, they, arguably, were not the driving forces in the 1950s.

And the questions remain: what will humanity do to and on the Continent of Antarctica, and who will be allowed to participate in that great adventure?

#### Facts

1. Negotiations leading to the Antarctic Treaty which entered into force in 1961 were at the invitation of the United States.

2. The 12 original signatories to the Treaty were: Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, UK, USA, USSR. These countries were the original Contracting Parties to the Treaty, with responsibility to send representatives to consultative meetings.

3. Additional Contracting parties have acceded to The Antarctic Treaty.

- 4. The depository nation for the Antarctic Treaty is the United States.
- 5. The Treaty is registered pursuant to the Charter of the United Nations.

#### FURTHER READING:

The Antarctic Treaty http://www.ats.aq/documents/ats/treaty\_original.pdf Accessed 30<sup>th</sup> December, 2017.

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http://www.sciencepeopleandpolitics.com/v52014\_4p3.html

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Science, People & Politics. Iss 3 (July-Sept) V VI 2014. http://www.sciencepeopleandpolitics.com/v62015\_3p1.html

The 2017 Atlantic Hurricane Season, the seventh worst in history, according to the US National Hurricane Centre, ended on 30th November this year (2017). Operationally, the understanding and prediction of the tropical cyclones which have caused so much damage benefited from data collected by, among others, Jason 3 – an ocean topography satellite.

Jason has now been in low-earth orbit between lines of latitude of 66 degrees north and south since January 2016, orbiting over the same spot once every 9.9 days at an altitude of around 820 miles. With its data the scientific community are deepening knowledge of ocean dynamics, so critical to understanding the Earth system and predicting formation and behaviour of tropical cyclones (66 degrees south keeps the satellite well north of the 60 degree south line of latitude which demarcates the part of Earth governed by the Antarctic Treaty System.).

Here we take a look back to December 2009 when the fate of Jason 3, hung in the balance (see archive story below further reading).

#### Further reading.

24th November 2016: Press release about the full suite of products from Jason 3. The data were available from 1 July 2016 and are also used to forecast currents for commercial shipping and to spot environmental issues such as oil spills and algal blooms.

https://www.eumetsat.int/website/home/News/DAT\_3288814.html?lang=EN Accessed 31 December 2017.

Geophysical Data Record (GDR) and Interim Geophysical Data Record (IGDR) from the National Centers for Environmental Information. https://www.nodc.noaa.gov/sog/jason/qa.html

Last modified 28th September, 2017 - when accessed 31 December, 2017.

NOAA gets new global ocean satellite (namely Jason 3). From 2016. https://www.nesdis.noaa.gov/jason-3/ Accessed 31 December 2017.

What is Jason 3. https://www.nesdis.noaa.gov/jason-3/mission.html Accessed 31 December 2017.

#### FROM THE ARCHIVES OF GAVAGHANCOMMUNICATIONS

#### Satellite operator faces critical months

by Helen Gavaghan Darmstadt and Mytholmroyd, UK (First published December 2009).

Citing the World Bank, Mikael Rattenborg, director of operations at the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), told journalists last Thursday (4th December, 2009) that severe weather events are increasing. His second significant message was that if the organisation does not receive full funding for its planned follow-on satellite mission (Jason-3) to measure sea-surface height its internationally mandated mission to collect data crucial for climate change scientists is in jeopardy.

Mr Rattenborg said that he hoped EUMETSAT's leading role in collecting climate data would be confirmed during the UN-sponsored climate change talks in Copenhagen this week and next, but that the litmus test would be whether Jason-3 receives funding.

He was speaking at an event billed by EUMETSAT as an effort to extend their contact with journalists. Some 25 of us from northern, central and western Europe attended.

SCIENCE, PEOPLE & POLITICS [ISSN:1751-598X]

#### FROM THE ARCHIVES OF GAVAGHANCOMMUNICATIONS

The EUMETSAT Council had just made the decision to extend the deadline for funding Jason-3 until 31st January, 2010, and a communique in the IGO's three official languages (English, French and German) was handed by secretariat staff to journalists when we arrived.

EUMETSAT is an intergovernmental organisation (IGO) with responsibility for planning the instruments on Europe's weather satellites, for operating the satellites and ground stations, for collecting operational climate change data and for feeding data to the national weather services of its Members States, and to a network of facilities developing more detailed analytic products. According to its website, on 7th December 2009 EUMETSAT had 26 Member States. For the future, said Mr Rattenborg, the organisation wants to recruit Member States from all those countries that are likely at some stage to become members of the European Union. EUMETSAT and the EU are legally unrelated intergovernmental bodies.

The IGO was founded to provide weather data from space 24 hours a day, 365 days a year without any interruptions. As an operational body the organisation has eschewed risky R&D that might go wrong and undermine its operational role. This operational rather than research approach was also incorporated into its Convention when the Member States added the role of providing operational climate monitoring data to its original mission of collecting weather data. When I asked if these two roles - monitoring weather and data relevant to climate change - led to internal tensions Mr Rattenborg said, "Our stakeholders are the National Weather Services. We do climate but not to the detriment of weather."

The organisation's satellites are in two types of orbit: geostationary and polar. Geostationary satellites appear stationary with respect to the Earth, and EUMETSAT's geostationary satellites capture images of Europe and to the edge of Afghanistan and Africa. The polar orbiting satellites view all Earth. This week the European Space Agency, which develops EUMETSAT's satellites, will award the prime contract for the next generation of geostationary meteorological satellites.

A significant issue that EUMETSAT needs to resolve includes harmonisation of data from different instruments made in different technological eras so that scientists are not comparing apples with pears as they look for changes in weather patterns and, separately, look for signals in climate data. The organisation is also interested in efforts to couple computer models of the ocean and the atmosphere. And instrumentation for the future will include lightening detection to improve warnings of severe thunderstorms.

Mr Rattenborg and his colleagues spoke through the afternoon in a briefing room which actually extends balcony like, with a great curving glass wall, in a way that meant we journalists all looked down into the operational control room visible behind the speakers. Blinking screens and world maps were visible and screens and screens of numbers as raw data streamed from satellite to antennas to the control room. There to be turned into numbers representing patterns of radiation levels. Numbers indicative of basic atmospheric properties.

If you've ever taken a photograph then you also have captured raw radiation data. But you were not 36 000-kilometres away from your subject peering through a haze of clouds. Nor were you 800 kilometres away racing past your subject at 5 miles a second. And your photograph was not essential to warning towns, cities, nations and continents of approaching storms, tornados or hurricanes. Your photograph was not the basis of national decisions about how to spend millions of pounds. That is what EUMETSAT and its sister agencies do.

### Compassionate sentences in indecent and sexual assault cases

By Helen Gavaghan, Bradford, Crown Court (UK), 28th September, 2017

HHJ David Hatton QC today sent John Wilson (70) down for to 21 years, as a sentence for a number of indecent assaults, one case of sexual assault, and for conspiracy. His honour praised the victims for their courage in speaking in open Court of their ordeals. The judge said Mr Wilson's behaviour had been disgusting, and forbade Mr Wilson from ever again having a role as a minister of religion. Judge Hatton did, however, clarify that Mr Wilson might still worship and be a congregation member.

Citing St Matthew, and beginning his remarks with the Sermon on the Mount, Judge Hatton also handed down to Mrs Mary Wilson (79), Mr Wilson's wife, 22 months suspended for two years, as a sentence for aiding and abetting her husband. Mrs Wilson's had been silent about her husband's behaviour. The judge said he would have sent her to prison, but for his awareness of her age, infirmity and physical illnesses. The judge accepted Mrs Wilson would face stigma.

Both Mr Wilson and Mrs Wilson were placed on the Sex Offenders' Register. Mr Wilson indefinitely; Mrs Wilson for 10 years. Both had been found to be "false prophets", said the judge.

Mr Wilson had been a pastor in one of the churches of The Assembly of God, from which he was expelled in 1993 for behaviour of the type for which he was today sentenced. Mr Wilson's crimes spanned the mid 1980s to 2010. The record shows that before the mid 1980s Mr Wilson was of good character.

A significant amount of money was paid in a civil case to one of Mr Wilson's victims around the time of his expulsion from The Assembly of God. Mr Wilson then went on to form another church, which became a nexus of further offences, leading to today's sentencing in Crown Court.

Mr David McGonigal QC, independent counsel for the Crown Prosecution Service, told the Court of the psychological, emotional and physical harm experienced by Mr Wilson's victims. The severe physical harm to some of the victims includes clinical levels of anxiety, or depression and post traumatic stress disorder. Many of them, thus, are under the care of consultant psychiatrists, and have had periods in hospital.

One victim chose to read her impact statement to the Court. Facing the dock she said she had come to think she was not worth the space she lived in, nor the air she breathed, but that God had not deserted her. "He's forgiven me so much, so who am I not to forgive?", she asked. Having read her statement this victim immediately left Court.

Mr McGonigal told the Court that Mr Wilson had abused his position of trust as a pastor, while committing offences spanning from the mid 1980s to 2010.

Each defendant was represented by Queen's Counsel and junior and solicitors. The judge thanked all Counsel and solicitors for their work, and commended the officer in the case - who prefers not to be named - and her team, for their work in what the judge called a sensitive and complex case. The work has taken some years, and took place around the country.

A representative from a Manchester-based civil law firm for insurers was in Court.

# **QUIZ FOUR**

1 What is the capital of Iran?

2 Which European region is pushing for secession from Spain, and what is the region's capital?

- 3 Which British airline ceased trading on 2nd October, 2017?
- 4 Which Sea do the Ukraine and the Crimea border?
- 5 In November who was prime minister of Cambodia?
- 6 Which group of people have been fleeing in 2017 from Myanmar?
- 7 In which city is the International Chamber of Commerce based?
- 8 What was the name on 31st December 2017 of the Prime Minister of Japan?
- 9 In which year was CRISPR-Cas 9 discovered?
- 10 What is CRISPR-Cas9?

# ANSWERS

- 1 Teheran
- 2 Catalonia, Barcelona.
- 3 Monarch
- 4 The Sea of Azov

5 Hun Sen Source: http://www.telegraph.co.uk/news/2017/11/16/cambodian-oppositionparty-dissolved-supreme-court-hun-sen-clears/ Accessed 31st December 2017.

- 6 Rohingya
- 7 Paris
- 8 Shinzo Abe
- 9 2 0 1 2
- 10 A gene editing method

Quiz (No 4) covering October – December, 2017 by: *Science, People & Politics* / Helen Gavaghan© SCIENCE, PEOPLE & POLITICS ISSN 1751-598X PRINT AND ONLINE [PDF+HTML]

