

Values, World Society
and Modelling
Yearbook 2014

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By

Gordon Burt

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ACKNOWLEDGEMENTS

When I joined the Conflict Research Society in 1982, there were two key figures. I never met John Burton but everybody talked about him. Values were at the heart of John Burton's approach to conflict resolution. 'World Society'¹ was the title of one of his books. Michael Nicholson I did meet – and continued to meet over the next couple of decades. 'Formal Theories in International Relations'² was the title of one of Michael's books – 'formal theories', in other words modelling. So there you have it: values, world society and modelling.

John Burton moved to George Mason University in the mid-1980s and two young colleagues there were Kevin Avruch and Dennis Sandole. In 2014 Kevin Avruch was joint recipient of the CRS Book of the Year Prize for his book *Context and Pretext in Conflict Resolution*.³ Kevin Avruch has kindly allowed me to use the talk he gave on receiving the award and this appears here in Chapter 2. Dennis Sandole also has kindly allowed me to use two pieces which he wrote in 2014, both concerning the relations between the West, Russia and China. These appear here in Chapter 7. In 1969 Michael Nicholson became the founding director of the Richardson Institute for Conflict Research, first in London and then in Lancaster. Almost four decades later Steve Pickering gained his PhD at the Richardson Institute. Steve Pickering has kindly allowed me to use his analysis of Ukrainian and Russian language tweets in the Ukraine, just as Russia was taking control of Crimea. Steve has also allowed me to use his data on the number of states which existed in the period 1816 to 2014. These contributions appear in Chapters 9 and 8 respectively.

What the Conflict Research Society has done is to enable me 'to feel at home in the world'. The Society's 'nurturing of flourishing' means that this is my third book. Attending the conferences, sitting on the Council, I have felt a member of a community. My six years as the Chair of the Society has given me insight into the triumphs and pitfalls of leadership!

¹ Burton, John. *World Society*. London: Macmillan, 1972.

² Nicholson, Michael. *Formal theories in international relations*. Cambridge: Cambridge University Press, 1989.

³ Avruch, Kevin. *Context and Pretext in Conflict Resolution: Culture, Identity, Power and Practice*. Boulder CO and London: Paradigm Publishers. 2012.

So, thank you to my many friends and colleagues on the Council and in the Society.

Of course there is a ‘values, world society and modelling’ approach to acknowledgements. For someone like me who likes to imagine I think for myself, there are a lot of references in the bibliography. Moreover, a minute ago there were 7,375,130,776 people in the world. Not all of them contributed equally to me living and writing this book. However there’s probably a power law, $y=ax^b$, for contributions to my book, which I do need to acknowledge.

The reader will be meeting some babies in this book. Adults have much to learn from babies and much to learn from mothers and babies. It’s the ‘nurturing of flourishing’. Callum and Robert featured in my previous book but since then Kaia, Rosa and Rory have arrived. Thank you to all the family. I am told I don’t need to mention everybody, just as long as I mention Catherine, still teaching me about social reality after forty-five years.

CHAPTER ONE

INTRODUCTION AND OVERVIEW ... ARTS AND SCIENCE

The year 2014 was the centenary of the start of the First World War and the seventieth anniversary of the Normandy landings in the Second World War. The year saw violent conflict in Ukraine and the rise of the Islamic State in parts of Syria and Iraq. A referendum was held in Scotland to decide whether to stay in the UK. Centrist parties lost ground in the European Parliament elections and a general election was held in India, the biggest ever election in the world. Thomas Piketty sparked debate with his analysis of growing inequality in capitalist economies. Politicians in the UK talked about 'British values' and debated 'is Britain Christian?'. The British Museum lent one of the Elgin Marbles to the Hermitage in St. Petersburg and Putin made overtures to China. In California Elliot Rodger went on the rampage killing six people. Malala Yousafzay won the Nobel Peace Prize, Maryam Mirzakhani won the Fields Medal and Judit Polgar retired from international chess. Germany won the World Cup in Brazil. Echoes of the Big Bang confirmed the theory of how the universe began.

The 2014 Yearbook discusses these events alongside a variety of other specific events and general issues. It does not aim to be a comprehensive or representative account of the year's events – it is merely a personal selection, written from the UK, and informed by the UK press, mainly *The Times* - but with aspirations to reach beyond that particular location. It draws on the monthly issues of the *Commentary* which were produced during the year under the banner of *A New Agenda*.¹ *A New Agenda* seeks to explore all aspects of society using all the academic disciplines paying special attention to values ... with special interest in modelling ... not disinterested in practice ... and aspiring to high academic standards.

Now my so-called 'New' Agenda did not come out of the blue. Over the previous year the Council of the Conflict Research Society (CRS) had

¹ Burt, Gordon. "A New Agenda." Accessed 1 June 2015.
<https://sites.google.com/site/gordonburtmathsocsci/home/a-new-agenda>.

been discussing its strategy. There had been a variety of views but one of the views – from Society President, Oliver Ramsbotham² - is particularly close to *A New Agenda*. It specified eight “features that define CR” (here “CR” means “conflict research”). As you can see there is a fair amount of overlap between this view of CR and my *New Agenda*.

“Consonant with the original aim of the CRS and its existing Rules, perhaps the following can be seen to delineate CR in comparison with traditional International Relations topics and approaches etc:

- (1) CR’s topic is human conflict in all its modes and guises - root causes etc.
- (2) In order to address this adequately CR must be interdisciplinary.
- (3) CR must also be multi-methodological (statistical analysis informs ‘objectivist’ rational actor/bargaining, ‘subjectivist’ communications/problem solving, ‘structuralist’ institution-building, ‘transformative’ dialogical/discursive approaches, etc.).
- (4) CR analysis must be multi-level.
- (5) CR approaches must be multi-cultural and gender inclusive (while recognising tensions, e.g. between patriarchal cultures and feminism).
- (6) CR is both analytic (polemology) and normative (informing conflict resolution). In the latter capacity it investigates requirements for transforming actually or potentially violent conflict into non-violent forms of social, political, cultural etc change.
- (7) CR is concerned with researching the relation between theory (theoria) and practice (praxis).
- (8) CR offers critical assessment of various forms of activism including both military (e.g. peacekeeping) and civilian (e.g. non-violent direct action).”

This was in 2013 around the time of the Society’s Fiftieth Anniversary and Steven Pinker had agreed to come to our Essex conference to receive the award of CRS Book of the Year, jointly with Joshua Goldstein. There was general excitement that Steven Pinker was coming to our conference. And Steven Pinker came - and he more than fulfilled our expectations. It was the high point in a marvellous conference celebrating our fiftieth anniversary.

After the conference I wanted that excitement to continue. And so I dreamt up the idea of the Steven Pinker Agenda – and I set up the Steven Pinker Agenda website, ‘Steven Pinker’s book sets an exciting Agenda’. With its tremendous range and depth, the book presented an extremely

² Ramsbotham, Oliver. “[Features that define CR.]” *Paper to CRS Council*. Conflict Research Society Council. Winter, 2013.

attractive and challenging agenda. With its attention to five Inner Demons, four Better Angels the book addressed conflict and cooperation - the issue of values. In its discussion of six historical trends and five Historical Forces the book investigated all levels and all spheres of society. And the book did this by drawing on a wide range of disciplines.

Having dreamt up the notion of the Steven Pinker Agenda I began to get a bit worried. Would Steven Pinker approve? Was I perhaps engaging in the crime of identity theft? And did the agenda I wanted to pursue actually correspond to what Steven Pinker was saying? And that is how at the start of 2014 I came up with the notion of *A New Agenda*.

Arts and science

With its concern for values and world society, should *A New Agenda* look to the Arts, to Humanities? ... or should it look to Science? ... or to both?

Sometimes there can be heated debate between Humanities and Science, a good example being the debate between Steven Pinker and Leon Wieseltier.³ Another example is the debate between biologists Francis Crick and Richard Dawkins and philosopher Mary Midgley.⁴

“You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and their attendant molecules.”

“[Mary Midgley seems outraged] by Crick’s presumption, as though it means that our sense of self is an illusion, an elaborate trick played by our nerve cells.”

I once met Mary Midgley – in 1992. On the way back from a conference we had a discussion about whether computers could think and be creative. I mentioned the case where a computer had devised a novel proof that the angles B^{\wedge} and C^{\wedge} of an isosceles triangle are equal. This involved congruence between the triangles BAC and CAB using two equal sides and the included angle. She was not impressed!

³ Pinker, Steven and Leon Wieseltier. “Science vs. the Humanities. Round III.” New Republic, September 26, 2013. Accessed 1 June 2015. <http://www.newrepublic.com/article/114754/steven-pinker-leon-wieseltier-debate-science-vs-humanities>.

⁴ Anthony, Andrew. “Late stand for a thinker with soul.” *The Observer*, The New Review, March 23, 2014: 16-18.

Mathematical modelling plays a key role in this book and the intellectual heritage for my work in this area can be indicated by the following narrative that links Lewis Fry Richardson (1881-1953), Lionel Penrose (1898-1972) and Cedric Smith (1917-2002) ...

I was given my day visitor ticket and halfway up the winding stairs was the exhibit, *Art and Honour: Contemporary Impressions of the First World War*. Studying the many interesting items my eye caught the name Lionel Sharples Penrose. There was his journal and Personal Sketchbook. It was open at a page with a map sketching northern France and Belgium and a record of the places he was stationed at during 1918, headed “All over the shop”. Two of his sketches were there, one of a hospital train at Rouen, dated 7.8.18.⁵

On leaving school in 1916, Lionel Penrose served, as a conscientious objector, with the Friends' Ambulance Unit/British Red Cross in France until the end of the First World War - an experience he shared with Lewis Fry Richardson.⁶

From 1945 to 1965 Lionel Penrose occupied the Galton Chair at the Galton Laboratory at University College London. For these two decades he was a colleague of Cedric Smith. In 1946 Cedric Smith was appointed Assistant Lecturer at the Galton Laboratory at University College London. He remained at UCL for the rest of his career, becoming successively Lecturer and Reader, before appointment as Weldon Professor of Biometry in 1964.⁷

Thus Lionel Penrose had strong links with two of the central figures associated with the Conflict Research Society: Cedric Smith, a founding member and prime mover; and Lewis Fry Richardson whose earlier work inspired the Society and after whom the Richardson Institute was named. (Somewhere in this cupboard on my left are the CRS Archives. I suspect Lionel Penrose may have been an early member of the Society).

The final chapter in this book, in its discussion of the Big Bang, will cite Roger Penrose, a son of Lionel Penrose. On a more personal note I was an Open University colleague of another son, Oliver Penrose. In 1985 Oliver chaired the course U235 *The Nuclear Debate* – and I was a member

⁵ UCL. “Art and Honour: contemporary impressions of WWI.” Accessed 1 June 2015. <http://www.ucl.ac.uk/library/exhibitions/ww1/>.

⁶ Wikipedia. “Lionel Penrose.” Accessed 1 June 2015. http://en.wikipedia.org/wiki/Lionel_Penrose.

Wikipedia. “Lewis Fry Richardson.” Accessed 1 June 2015. http://en.wikipedia.org/wiki/Lewis_Fry_Richardson.

⁷ Wikipedia. “Cedric Smith (statistician).” Accessed 1 June 2015. [http://en.wikipedia.org/wiki/Cedric_Smith_\(statistician\)](http://en.wikipedia.org/wiki/Cedric_Smith_(statistician)).

of the course team. Finally as a schoolboy and enthusiastic chess player I knew about the then British Chess Champion, Jonathan Penrose, the third son.⁸

Given the debate between Arts and Science it is appropriate to ask whether the scientific approaches of Richardson and the Galton Laboratory colleagues Penrose and Smith have any links with the humanities. It turns out they do – in a very direct manner. For our Christmas 2014 festive reading Catherine and I selected books by the two sisters A. S. Byatt and Margaret Drabble. Quite unexpectedly the name of Lionel Penrose appeared in the text – this was in Margaret Drabble's *The Pure Golden Baby* which refers to Penrose's "Colchester Survey" of 1938, the earliest serious attempt to study the genetics of mental retardation. Then, reading A. S. Byatt's *The Biographer's Tale*, I found it is partly about Francis Galton who inspired and financed Karl Pearson's work at UCL and the book refers to The Biometric Laboratory.⁹

Another link is a recent exhibition at the Scottish National Gallery of Modern Art in Edinburgh, *The Amazing World of M C Escher*, "arguably the greatest 20th century artist to be locked out of the world of art". Roger Penrose first encountered the artist in 1954 and was inspired to devise the tribar, a two-dimensional pattern that seems to be in three dimensions. He and his father Lionel Penrose published an article on the tribar in the British Journal of Psychology in 1958 – and Escher incorporated the tribar into some of his later work. Roger Penrose was asked whether he approached the exhibition as an art lover or as a mathematician.

"For those who do pure mathematic for its own sake, it's the aesthetic, the joy, the beauty in the subject itself, that elegance which lies in a proof or a

⁸ Wikipedia. "Roger Penrose." Accessed 1 June 2015.

http://en.wikipedia.org/wiki/Roger_Penrose.

Wikipedia. "Oliver Penrose." Accessed 1 June 2015.

http://en.wikipedia.org/wiki/Oliver_Penrose.

Wikipedia. "Johnathan Penrose." Accessed 1 June 2015.

http://en.wikipedia.org/wiki/Jonathan_Penrose.

⁹ Wikipedia. "A. S. Byatt." Accessed 1 June 2015.

http://en.wikipedia.org/wiki/A._S._Byatt.

Wikipedia. "Margaret Drabble." Accessed 1 June 2015.

http://en.wikipedia.org/wiki/Margaret_Drabble.

Drabble, Margaret. *The Pure Golden Baby*. Edinburgh: Canongate, 2013.

Byatt, Antonia S. *The Biographer's Tale*. London: Chatto & Windus, 2001.

result. Artistry in some form is so important in mathematics. I'm not sure you can distinguish between the two."¹⁰

Finally we may note that the interdisciplinary nature of the CRS is not surprising. The CRS was founded in 1963. Just a few years before that in 1959 C. P. Snow, the Steven Pinker of his day, delivered a lecture on *The Two Cultures*, in which he laments the gulf between scientists and "literary intellectuals".¹¹

Overview

Part I Values

Part I of the book is about Values. Values are fundamental. They are both cause and consequence. Values drive our actions and values provide the criteria for judging the consequences of our actions. Sociologists' concern about the relationship between the individual and society is reflected in the field of conflict resolution, in the contrast between John Burton's invocation of 'Basic Human Needs' and Kevin Avruch's attention to culture (Chapter 2). Society presents a complex structure of activities for individuals to participate in. The activities reflect the society's culture and an individual's participation in these activities generates value for the individual (Chapter 3). Participation in many activities involves relationships at the personal level and the nature of these relationships is crucial, as John Burton noted: 'how we communicate and relate with each other is fundamental to producing harmonious and hence peaceful societies' (Chapter 4). The life of an individual engages with the history of a society. Pavel notes that "the novel asks whether individuals can ever be morally reconciled with the world", and feeling at home in the world is central to people's lives (Chapter 5). At the group or societal level, 'our exceptional values' may be seen as being under threat and this is exemplified by debate about British values and the question 'is Britain Christian?' (Chapter 6).

Chapter 2 is about a social system and its values and is largely devoted to a talk by Kevin Avruch about his book, *Context and Pretext in Conflict Resolution*. Society is a multi-level system with individuals at one level and society as a whole at another level. Values exist at each level:

¹⁰ Wade, Mike. "I went to his house expecting staircases coming out of windows." *The Times*, Times 2. June 24, 2015: 8-9.

¹¹ Wikipedia. "C. P. Snow." Accessed September 1, 2015. http://en.wikipedia.org/wiki/C._P._Snow.

individuals have needs and societies have cultures. The chapter opens in a somewhat informal way with my personal reminiscences of the 1980s. It was a time when UK Prime Minister Margaret Thatcher championed the individual and denied the existence of society. This viewpoint was in sharp contrast to the view of sociologists such as Anthony Giddens and Stuart Hall (1932-2014). Turning now to the field of conflict resolution, Ramsbotham, Woodhouse and Miall note a contrast between John Burton and his invocation of ‘Basic Human Needs’ and Kevin Avruch’s attention to culture. The core of the chapter is the talk given by Kevin Avruch on jointly receiving the award of Conflict Research Society Book of the Year (2014) for his book, *Context and Pretext in Conflict Resolution*. In his writings in the 1980s and 1990s Avruch had criticised the prevailing theories of conflict resolution by John Burton and others for their “imperious universalism” and for being “devoid of notions of difference, of context, of culture at least as cultural anthropologists understood the term”. However Avruch recognised that there was a “problem with ‘culture’ as a term of reference” and realised that “I now had to examine critically what I and others had helped bring about”. The problem was that culture could be used as a pretext and the more powerful pretexts were the pretexts of those who had more power.

Chapter 3: society presents a complex structure of activities for individuals to participate in. The activities reflect the society’s culture; and an individual’s participation in these activities generates value for the individual. The diversity of everyday activities – work, money, home, fun, leisure, culture, style, travel, sport, driving, advertised consumption - can be seen in the various sections of a newspaper like *The Sunday Times*. The values placed on these activities are reflected in wishes for the future and in regrets about the past as well as in present actions. The experience of value is not constant, it changes in response to major life events – family events such as marriage, divorce, bereavement or childbirth; and work events such as unemployment, reemployment, retirement, relocation or migration. The trajectory of value over an individual’s lifetime is studied, particularly the relationship between childhood well-being and adult well-being and the effect of earlier well-being on longevity. Value exhibits continual fluctuations at a more detailed level: momentary happiness depends on perceptions of the present, memories of the past and anticipations of the future. Values attach to action and to causation. While there has been much research into happiness and wellbeing, it has also been argued that consideration needs to be given to other values. In particular the conflict between the value of life and other values, and the conflict between value for the self and value for others, is considered.

Another perspective on value is provided by research on emotion which identifies the dimensions of valence (positive or negative), strength and activation. Whereas emotion often refers to a specific situation or event, personality concerns a more durable aspect of an individual, the Big Five dimensions being agreeableness, conscientiousness, stability, extraversion and openness.

Chapter 4 is about relationships at the personal level. We consider relationships between children and parents, between couples, between friends, between humans, pets and other animals, and between an individual and their carer or therapist. Our focus will be on whether the relationship is positive – “harmonious” in Burton’s terms – or negative. Just before his death in 2010 John Burton called for a Universal Harmonious Human Relations Research Association: “how we communicate and relate with each other is fundamental to producing harmonious and hence peaceful societies”. Steven Pinker and others have suggested that our relationships – at all levels of society - are becoming less violent. There is a great demand in society for emotional and relationship advice and such advice is offered by newspapers on a daily or weekly basis. We start by looking at the emotional and relationship development of babies. Parenting style can be positive or negative, active or passive. We then consider adults and their closest personal relationships. A key distinction is between singles and couples and a change in status is a major life event – either a change from being single to being a couple (for example a marriage) or a change from being a couple to being single. The latter change may come about through separation, divorce (in the case of a marriage) or death. Gottman emphasises the importance of the balance between positivity and negativity in marital interactions. There is a cultural debate about the values of being a couple or being single, the value of marriage and divorce. The overall pattern of an individual’s relationships with family, friends and strangers is resource-limited with differential resource investments and differential value and a possible gap between expectations and reality. We consider the relationships between humans, pets and other animals. Humans can be positive or negative towards animals and animals can be positive or negative towards humans. Finally we consider the relationship between an individual and their carer or therapist. One account of the field is implied by the UK school syllabus for Health and Social Care. Like the mother-baby relationship, care and therapy relationships are about ‘nurturing flourishing’ – the quality of the therapeutic relationship is key.

Chapter 5 is about the life of an individual. An individual engages with society. Individual and society, both are dynamic: so the life of an

individual engages with the history of a society. The engagement relationship can be positive or negative: in other words an individual may ‘feel at home in the world’ or not. At each point in life there is a past, present and future, and the relationship at each stage may be positive (A) or negative (B), giving eight possible trajectories:

AAA persistently positive	‘feeling at home in the world’
BAA improving	‘happy ending’
BBA about to improve	‘hope of happy ending’
ABA fluctuating	
BAB fluctuating	
AAB about to deteriorate	‘a way of life under threat’
ABB deteriorating	‘a way of life destroyed’
BBB persistently negative	‘not feeling at home in the world’

Steven Pinker and others argue that the humanities provide a powerful insight into how individuals engage with society. Pavel’s account of the novel is considered and the quotation that “the novel asks whether individuals can ever be morally reconciled with the world” is noted. The subsequent sections consider the lives of specific individuals ... the Dustin Hoffman and Emma Thomson characters, a football-unfeeling mother, a Jihadist, a lion-tamer, an infantryman, rampage-killer Elliott Rodger ... and whether or not they feel at home in the world, whether or not their way of life is under threat and how they react if they do not feel at home or if they feel under threat. Throughout life an individual is presented with different options, different paths to follow. The set of possibilities constitute a tree of branching paths. This is illustrated by the branching paths for homicide, suicide and rampage killing.

Chapter 6 considers values at the group or societal level. How do ‘we’ see ‘our values’? Do we think of them as unanimously held within our own group? Comparing ourselves with other groups, do we think of our values as ‘exceptional’ ... do we think of them as ‘universal’? Are ‘our values’ good or bad? Are ‘our values’ safe or under threat? In many conflicts there are positive perceptions of self and of ‘our values’ and negative perceptions of the other and of ‘their values’. These perceptions are regularly reinforced, for example in anniversaries of historical events: 1914, the start of the First World War; 1815 the Battle of Waterloo; 1314 the Battle of Bannockburn; and so on. In some cases the possession of arms itself is a celebrated part of nationalism. The two world wars were global events but they were locally experienced and are locally – differentially - remembered. The main focus of the chapter is on

exceptionalism, the belief in ‘our exceptional values’. The idea of American exceptionalism is similar to other nations’ perceptions of their own exceptionalism. An extended analysis is given of contemporary discussion in the UK about British values and about the question “is Britain Christian?”. The dimensions of the debate are charted and the views of Prime Minister David Cameron and secularist A C Grayling are analysed. Neil MacGregor, director of the British Museum, talking of the loan of one of the Elgin Marbles to the Hermitage in St Petersburg for its 250th anniversary, referred to ‘this stone ambassador of the Greek golden age and European ideals’. But is it true that the values of the European Enlightenment are uniquely aligned with the values of Ancient Greece?

Part II World society

Chapter 7 is about world politics. World population is growing but the rate of growth is falling. In some countries the population will increase, in other countries the population will decline. Governments of the world have a geo-political structure which exists at a number of different levels. At the highest level there are world organisations which involve ‘all’ the countries of the world. The United Nations is one such organisation (UNESCO statistics on gender are discussed in Chapter 12); and there are also specialised organisations such as FIFA (see the discussion of the World Cup in Chapter 13). Next we can think of the dominant powers in the world. Later in this chapter we shall note Dennis Sandole’s concern that there is division between the West, Russia and China and his suggestion that more cooperation be developed between them. A central issue in the relations between the West and Russia is the status of countries which were formerly in the Soviet Union or part of the Warsaw Pact. Ukraine is discussed in Chapter 9 while later in the present chapter we consider a study of electoral volatility in post-Communist states. At the same time as post-Communist states have joined the European Union, more longstanding member states have expressed less commitment to it and the success of anti-EU parties in the European Parliament elections is discussed later in this chapter. This lower commitment is partly associated with concerns about immigration (see the brief section at the start of this chapter) and also partly due to slow or no economic growth (an aspect of the world economy which is discussed in Chapter 11). In the UK these sentiments about the EU are not only represented by the UK Independence Party (UKIP) which gained twelve extra seats in the European Parliament elections, but also find expression in Prime Minister David Cameron’s ambition to renegotiate the terms of Britain’s membership. However the

existence of the UK as a unitary government itself came under challenge in the referendum on independence for Scotland (see Chapter 10). Electoral volatility also found expression in the largest-ever election in the world, in which India's dominant political party, the India National Congress experienced its worst ever defeat. The chapter ends with a conceptualisation of tension and volatility in a multi-level geopolitical structure.

Chapter 8 looks at world history. The British Museum charts 'world history from two million years ago to the present' using 100 objects. But will the human race last another million years? Whereas museums preserve historical artefacts, elsewhere historical artefacts are destroyed. In 2014 the Islamic State of Iraq and al-Sham (Isis) declared itself ruler of all Muslims and destroyed mosques in Mosul. And indeed there is a world history of the destruction of historical artefacts, including the destruction of religious buildings. Given the violence in the Middle East and elsewhere it was natural to feel pessimistic about the current state of the world and fearful of the future. Set against this were the arguments of Steven Pinker and Joshua Goldstein that violence was in decline, and the view of Matt Ridley that the decline of violence is just one of many ways in which things are getting better. The declaration of a new caliphate echoes the rise and fall of earlier caliphates just as other contemporary pressures for independence or incorporation echo the world history of independence and incorporation. A dynamic fractal core-periphery model of this world history of independence and incorporation is presented.

Chapter 9 is about Ukraine. "Looking back on my childhood in pre-war eastern Poland ... [it was] a 'multi-cultural' society ... not without its tensions ... the Ukrainian peasantry were bottom of the pile ... [the landowners were] Lithuanians ... Poles occupied the middle stratum ... Eastern Ukraine was dominated by Russia and was always ... Russophile if not Russified, while western Ukraine was more influenced by Poland." In November 2013 the Ukrainian government switched from west to east – from seeking closer links with the European Union to seeking closer links with Russia. Protests follow, riots, the President flees, Russia takes over Crimea, rebellion in eastern Ukraine ... Ukraine: united or divided? Steve Pickering colours the Ukraine map blue or red on the basis of Ukrainian or Russian language tweets in early March 2014. An analysis of presidential elections in the period 1991-2014 shows a west-east continuum of political preferences. Having identified a west-east continuum in presidential voting, it is found that this is reflected in the geography, economy, ethnicity, language and religion of Ukraine. The east-west (and north-south) dynamics of Ukraine is evident in centuries of history. A simple

model of a divided society with two groups on a geographical continuum is presented. As the boundary between West and East moves farther east: the size of the West increases and the size of the East decreases; the proportion of Ukrainians in the West decreases and the proportion of Russians in the West increases; and the proportion of Ukrainians in the East decreases and the proportion of Russians in the East increases – in the model. Suppose each individual wants to be in a large state (the bigger the better) and at the same time wants their nationality to be in the majority (the bigger the better). However these two goals are in fundamental conflict. Under certain special very strong and restrictive assumptions maximum satisfaction occurs when a boundary is at the midpoint – in the model, not in reality.

Chapter 10 is about Scotland. On 18 September 2014 a referendum was held on Scottish independence. It was a debate between those claiming ‘our Scottish values are exceptional’ and those claiming ‘our British values are exceptional’. The relationship with England has been central to the geo-political history of Scotland. Personal memories of and attachments to Scotland are in all our minds but what sometimes happens is that invalid extensions are made to these personal memories and attachments, giving rise to a discourse of exceptionalism. A case in point is the Scottish exceptionalism of a golfing Presbyterian east-coast lowlander. In comparison with the simplicity of group exceptionalism, scientific analysis may find that each group is more varied within itself and less distinctive from other groups than is imagined – and this is shown to be the case for Scottish exceptionalism. Scotland’s history has seen the formation of the nation, independence, union with the rest of Britain and over the last century, particularly the last half-century, measures of partial autonomy, culminating in the independence referendum of 2014. Support for political parties has fluctuated over the past couple of centuries, with increasing support for the Scottish National Party (SNP) in recent times. Opinion polls consistently indicated that the referendum voting would reject independence although in the weeks before the voting the gap narrowed. Some studies found support for alternative options to those on the ballot paper. Independence was rejected by 55% to 45%. A somewhat greater support for independence was found in local areas which had high unemployment and low Conservative support, which were in the west central area of the country and which had lower turnout. Glasgow and Edinburgh, Scotland and England, are each more varied and less distinctive than is sometimes supposed. As in other chapters special attention is given to the conceptualisation of group differences.

Leaving the political sphere behind, the last three chapters in Part II turn to the world economy, gender relations and world sport (not, of course, that these spheres are without a political aspect!).

Chapter 11 is about the world economy. It is a global system. So to understand any local economy it is helpful to know about the world economy as a whole. Growth and inequality present a major policy challenge. There is a need to conceptualise growth and inequality within nations, between nations and for the world as a whole. The following statements are subject to much debate.

- There is absolute poverty.
- There is great inequality between individuals.
- There is great inequality between continents.
- Some countries have more inequality than others.
- There is substantial economic growth.
- The poorer regions have faster growth than the richer regions.
- There is income stagnation for the poorer people in richer countries.
- Ordinal inequality is constant.
- Absolute poverty is declining.
- Global inequality is declining.
- Major redistribution should take place.

Concerning the last of these Thomas Piketty “sparked an epic debate” with his new book *Capital in the twenty-first century*. Inequality has been increasing, he argues, with top incomes receiving an increasing share.¹² Others have challenged Piketty’s figures, their interpretation and their explanation. A simple descriptive two-region, two-class model of growth and inequality is offered to help think about these issues. Power law and other models of economic distributions are noted. A spatial model of growth and inequality in UK house prices is presented.

Chapter 12 is on gender. Three women hit the headlines in 2014. Malala Yousafzay won the Nobel Peace Prize fighting for the right of girls to education. Maryam Mirzakhani was the first woman to win the Fields Medal, the ‘Nobel Prize’ of mathematics. Also, World Chess Championship contender Judit Polgar announced her retirement. All three women have excelled in fields – Nobel prizes, mathematics and chess – where women are rare. How are we to explain this rarity? Gender is a major division between people in world society. The division has

¹² Piketty, Thomas. *Capital in the twenty-first century*. Cambridge, MA: Belknap Press, 2014.

biological, psychological and cultural aspects. Popular discussion of gender lacks conceptual sophistication and displays gender exceptionalism. There is a need to conceptualise historical trends in gender inequality within nations, between nations and for the world as a whole. Social programmes for literacy and education are important in the cultural formation of gender inequality.

World literacy rates and UK GCSE exam scores are mirror opposites. Worldwide, men have higher literacy than women; but in the UK across school subjects, girls have higher GCSE exam scores than boys. By coincidence and loosely speaking the equation for world literacy is the mirror opposite of the equation for GCSEs. World literacy rate z-scores: female=1.18 male-0.54. GCSE exam z-scores: male=1.00 female-0.23. There is a gender aspect to subject differentiation with a law of comparative advantage. Female relative participation f is related to female relative performance dz : $f=0.5+k(dz-0.23)$. The transition from GCSE to A level is characterised by stratification and differentiation.

Literacy and education are part of society as a whole and their relationship to the other parts of society needs to be considered. See for example a study of the relationship between educational level and fertility rate in the USA; and the recent Global Gender Gap Report produced by the World Economic Forum. Special attention is given to the conceptualisation of gender differences – and this has application to the conceptualisation of group differences in general, a topic discussed in Chapter 14.

Chapter 13 is about world sport. World sport is an important part of many people's lives and attracts great interest. Competition is its essence and takes a very concrete and public form. So there is much that conflict researchers can learn from it. Large numbers of people have a strong emotional investment in the outcome – sometimes also a financial investment. So there is much discussion in advance of what the outcome will be and predictions are often made. However there is no certainty about the outcome and so valid predictions can only be probabilistic in nature. There are a number of predictor variables which can be used, but the most direct predictor of future performance is past performance. The rationale is that stronger players beat weaker players, one indication of strength being past performance. St Petersburg, 1914, one of the stellar chess tournaments of all time, provides a simple demonstration that stronger players beat weaker players – probabilistically. A model developed in Chapter 14 is applied to a different chess tournament, confirming an equation in which outcome value depends on relative strength. Most of the chapter is devoted to the World Cup of 2014.

Beforehand, Daniel Finkelstein in *The Times* gave the chances of difference countries reaching the knockout stage and winning the cup. These chances are compared with the actual outcome. The relationship between chances, place, points, goal difference and percentage of goals is also investigated. Finally there is a discussion of the link between mathematical odds and betting odds.

Part III Modelling

Chapter 14 is on modelling. It opens with the presentation of a foundational mathematical approach to relationship dynamics. The role played in peace and conflict research by mathematicians and economists is noted. The different types of mathematics used are noted: prelude to statistics, statistics and mathematics. Foundational mathematics and foundational science are discussed and the role of Boulding, Rapoport and Deutsch in general systems theory is noted. A system with two subsystems and their environment is considered. An aside by Richardson on his arms race model suggests it can be reinterpreted as a model of positive reciprocation. Murray and Gottman's model of marital interaction is discussed. Reciprocation as a strategy in game theory is related to the work of Axelrod and Majeski. All this refers to the value of the relationship. Gottman found that the probability of a (marital) relationship continuing is a function of its value ... survival depends on fitness; participation depends on performance. The first law of participation dynamics is that the participation rate at any stage is a function of the participation reverse binary history. This implies the dynamics of an unobserved criterion variable. The dynamics of the criterion variable is driven by the dynamics of explanatory variables. What do the performance dynamics look like? Like stockmarket dynamics? Relationship dynamics is a trajectory through a structured environment. The characteristics of that structure are important. The performance at any stage depends on previous performance but how it does so is affected by structural variables.

In terms of game theory the relationship models we have been discussing are cooperative or non-zero-sum games. Depending on what action players take some outcomes are mutually positive or mutually negative. Complementing this is a brief discussion of constant-sum or zero-sum games with application to Chapter 13 on sport. A simple model of player strength and success in an all-play-all tournament with pairwise constant-sum games is presented. Two methodological sections follow, the first briefly noting how the criteria used in academic psychology are often absent in popular discussion. Then there is a section discussing

‘individuals and populations, attributes and distributions, percentages and z-scores ... the analysis of group differences’. There is a brief section on sets, spaces and functions. Finally the chapter shows how mathematics and physics have provided models of the universe. The early chapters of Roger Penrose’s *The Road to Reality* are studied. The book ends with the Big Bang!

How the Yearbook relates to my other work in social modelling

This Yearbook analyses contemporary world events drawing on foundational ideas in academic disciplines. These foundational ideas are discussed in my book *Conflict, Complexity and Mathematical Social Science*¹³. A case study of the relationship between these foundational ideas and complex social reality is discussed in my paper *A Foundational Mathematical Account of A Specific Complex Social Reality: Conflict in A Midsummer Night's Dream*¹⁴. The forerunner for this Yearbook is a series of papers and notes which I have written since 2010 and these are available on my Social Modelling website.¹⁵

The modelling approach which is evident throughout this Yearbook has its underpinnings in mathematical social science. My 2010 book opened with the following:

“This book seeks to present a foundational mathematical approach with rigorously developed, properly grounded theory ... The concept of conflict is grounded in and developed from a system of ideas relating to value. ... The topics of mathematical social science are grounded in and developed from a foundational mathematical science.”¹⁶

Throughout, this Yearbook has adopted an interdisciplinary approach drawing on Humanities and Science. This relates to my very deliberate

¹³ Burt, Gordon. *Conflict, complexity and mathematical social science*. Bingley: Emerald, 2010.

¹⁴ Burt, Gordon. “A Foundational Mathematical Account of A Specific Complex Social Reality: Conflict in A Midsummer Night's Dream.” In *Cooperation for a peaceful and sustainable world. Part 1*, edited by Bo, Chen, Manas Chatterji, and Hao Chaoyan. Bingley: Emerald, 2012.

¹⁵ Burt, Gordon. “Social Modelling by Gordon Burt.” Accessed 1 June 2015. <https://sites.google.com/site/gordonburtmathsocsci/home>.

¹⁶ Burt, 2010. Op. cit., p. 1.