26. Global Warming and the 'Scientific Consensus' 1939–2001[1]

Ian Castles

The probability that human activities are producing significant changes in the earth's climate is increasingly being seen as one of the world's major problems. Yet in 1939, within the lifetime of many of us, one of the world's leading scientists urged governments to take deliberate action to bring about global warming.

JD Bernal advocates a warming globe (1939)…

In *The Social Function of Science,* one of the most influential books of the century, the British physicist JD Bernal, FRS argued that in 'a fully organised world society' it should 'no longer be a question of adapting man to the world but the world to man'. In that context, Professor Bernal lauded 'the work of the Soviet Union in the conquest of the Arctic':

> … the present Arctic with its wastes of tundra, glacier and sea-ice is a legacy of the geological accident of the Ice Age. It will disappear in time, leaving the world a much pleasanter place, but there is no reason why man should not hasten the process. By an intelligent diversion of warm ocean-currents together with some means of colouring snow so that the sun could melt it, it might be possible to keep the Arctic ice-free for one summer, and that one year might tip the balance and permanently change the climate of the northern hemisphere.[2]

… and dismisses concerns that the Arctic ice cap may melt (1951)

In 1951, Bernal told a London audience about a massive hydro-electric and irrigation scheme in the Soviet Union ('two to three hundred times the size of the Tennessee Valley Authority scheme'), which would divert the northern rivers and make the deserts bloom:

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1 First published in *Dialogue* 20, 1/2001.

2 Bernal JD (1939). *The Social Function of Science*: 379-80.

> Its effect will be to convert every river into a series of lakes separated by dams with power stations; there will be no flowing Volga any more, but sea-going ships will go from lake to lake through automatically operated locks... [B]ig dams have been built on the Pechora and Vychegda, which used to flow into the Arctic; these are now being damned [*sic*] up so as to fall back into the tributaries of the Volga. It is possible that no water will ultimately go to the Arctic, where water is of little value; all the water will be turned back into the Black Sea, the Caspian Sea or the Aral Depression ...[3]

In response to a questioner who suggested 'that if the northern waters are deflected from the Arctic it will become saltier and will not freeze so easily, and ... this will reduce the polar ice', Professor Bernal said that 'there would be some such effect', but that 'this is a very long-term matter, and he did not think we should live to see the effect'.[4]

Meanwhile, Bernal was confident that the plan to build the 800-mile long Turkmen canal, based on twenty years of research by 650 Soviet scientists, would turn the Kara-Kum desert into 'one of the wealthiest agricultural districts'.[5] He believed that 'it would be possible to carry out a good deal of blasting in the desert areas with atomic bombs', and 'As the projects are long-term ones the radio-activity problem will be overcome'.[6] And the conversion of the major part of the Turkmen republic from desert into fertile land would help to stabilise the climate of the area:

> Only 60% of the flow of the Amu Darya is being taken for irrigation purposes, and the rest is going into the Aral Sea. The level of the Aral has been rising and this has brought about a change in climate. It is expected that the present level can be kept constant. One questioner says that a lot of water will be required if it is intended to irrigate an area equal to Egypt, but a lot of water is available. Actually the irrigation system of Egypt is very inefficient. Most of the Nile water flows uselessly into the Mediterranean ...[7]

3 Bernal, JD (1951). 'The Developments of Soviet Science' in *Anglo-Soviet Journal*, Autumn: 10.
4 *Ibid*: 14.
5 *Ibid*: 11.
6 *Ibid*: 14.
7 *Ibid*: 14..

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Untenable as these views have now become, they were put forward in all seriousness by a scholar whom CP Snow thought to be 'the most learned scientist of his time, perhaps the last of whom it will be said, with meaning, that he knew science'.[8] Many scientists regarded him as exceptionally knowledgeable: in the *Dictionary of National Biography 1971-1980,* John Kendrew wrote that Bernal

> had an extraordinarily wide knowledge of many branches of science, and of many fields outside science; if anyone in this century deserved the name polymath, it was he. Even as an undergraduate he was given the nickname Sage which stuck to him for the rest of his life... In 1939 he published *The Social Function of Science*. Today almost everything in the book seems obvious; in its time it had an immense influence.[9]

The benefits of hastening the melting of the Arctic ice cap were far from obvious in 1986, when this biographical essay appeared. Its author would have been well aware of this, because he was at this time President of the International Council of Science (ICSU). And in the previous year representatives of ICSU, the World Meteorological Organization (WMO) and the United Nations Environmental Program (UNEP) met to plan the institutional arrangements that the world now knows as the Framework Convention on Climate Change (FCCC) and the Intergovernmental Panel on Climate Change (IPCC).

Aynsley Kellow, then of the Faculty of Environmental Science at Griffith University, told the story at the National Academies Forum (NAF) conference *The Challenge for Australia on Global Climate Change* in Canberra in 1997:

> Representatives of WMO, UNEP and ICSU met in Villach, Austria in October 1985. The conference statement recommended that UNEP, WMO and ICSU take action to initiate, if deemed necessary, consideration of a global convention. This statement influenced the WCED to initiate the formation of the IPCC, which was established on 6 December 1988 by the General Assembly as a joint venture of WMO and UNEP, but it had evolved between 1985 and 1987 largely as the creation of governments, which could significantly influence membership and nominations.[10]

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8 Snow, CP (1964). 'JD Bernal, A Personal Portrait' in Goldsmith, Maurice and Alan Mackay, *The Science of Science: Society in the Technological Age*, 1964: 24.

9 Kendrew, John C (1986). 'Bernal, JD' in *Dictionary of National Biography 1971-1980*: 53-4.

10 Kellow, Aynsley (1997). 'The Politics of Climate Change: Problem Definition, Precaution, and the International Policy Process' in National Academies Forum, *The Challenge for Australia on Global Climate Change*: 86.

Dr Kellow went on to refer to claims that there were 'indications that a small number of governments with strong research interests in atmospheric modelling and space technology (USA, Canada, Sweden, Germany, UK, Australia) used intergovernmental organisations, especially WMO and UNEP, to keep a check on the research agenda emerging from the US dominated ICSU'.

Climate Change 2001: The IPCC Third Assessment Report

On 17 January 2001, delegations of 99 member countries of the IPCC met in Shanghai to participate in the Eighth Session of the Panel's Working Group 1 (WG1).

After considering the contribution of WG1 to the IPCC's Third Assessment Report and undertaking a line-by-line consideration of the 'Summary for Policymakers', the governments unanimously approved this Summary and accepted the full report *Climate Change 2001: The Scientific Basis*.

This full report, which runs to over 1000 pages, had been over three years in production and was the work of 122 Co-ordinating Lead Authors and Lead Authors, 516 Contributing Authors, 21 Review Editors and 337 Expert Reviewers. The reports of the other two IPCC Working Groups, which are comparable to the Report of WG1 in their length, period of gestation and the number of contributing authors and editors, were considered and accepted at IPCC meetings in Geneva (in mid-February) and Accra (in early March). The Summary for Policymakers of each of the three reports is available on the IPCC's website at www.ipcc.ch.

All three of the full reports are to be formally accepted by a meeting of the full IPCC Plenary in Nairobi, Kenya from 4-6 April, and a 'Synthesis Report', addressing nine specific policy relevant questions that require input from all three Working Group reports, will be adopted at a meeting in London from 24-29 September.

The WG1 Report: critique of the 'Summary for Policymakers'

The assessment by WG1 of the state of the Arctic ice cap that Bernal wanted to melt appears in the 'Summary for Policymakers' of the Working Group's report,

which was unanimously approved by governments on 20 January. It appears under the sub-heading 'Snow cover and ice extent have decreased', and reads as follows:

- Satellite data show that there are very likely [i.e. 90-99% chance] to have been decreases of about 10% in the extent of snow cover since the late 1960s, and ground-based observations show that there is very likely [i.e. 90-99% chance] to have been a reduction of about two weeks in the annual duration of lake and river ice cover in the mid- and high latitudes of the *Northern Hemisphere*, over the 20th century...
- *Northern Hemisphere* spring and summer sea-ice extent has decreased by about 10 to 15% since the 1950s. It is likely [i.e. 66-90% chance] that there has been about a 40% decline in *Arctic* sea-ice thickness during late summer to early autumn in recent decades and a considerably slower decline in winter sea-ice thickness (emphases added).

Although the sub-heading states without qualification that 'Snow cover and ice extent *have* decreased' (emphasis added), the references in the text are explicitly stated to relate only to the northern hemisphere and the Arctic.

In order to discover what has happened to the state of the Antarctic ice cap, the policymaker must turn to the final section under the general heading 'An increasing body of observations gives a collective picture of a warming world and other changes in the climate system'. In this section, the following statement is made under the sub-heading 'Some important aspects of climate *appear* [emphasis added] not to have changed':

- No significant trends of Antarctic sea-ice extent are apparent since 1978, the period of reliable satellite measurements.

The projections by WG1 of future changes in the global ice caps appear in a later section of the 'Summary for Policymakers'. Under the heading 'Global average temperature and sea level are projected to rise under all IPCC scenarios' and the sub-heading 'Snow and ice', the summary of the WG1 report presents the prospective changes in the northern and southern hemispheres as follows:

- Northern Hemisphere snow cover and sea-ice extent are projected to decrease further ...
- The Antarctic ice sheet is likely [i.e. 66-90% chance] to gain mass because of greater precipitation, while the Greenland ice sheet is likely to lose mass because the increase in runoff will exceed the precipitation increase.
- Concerns have been expressed about the stability of the West Antarctic ice sheet because it is grounded below sea level. However, loss of grounded ice leading to substantial sea level rise from this source is now widely agreed to be very unlikely [i.e. 1-10% chance] during the 21st century ...

NGOs, the media and greenhouse science

In his paper to the NAF conference in 1997, Aynsley Kellow provided some relevant background information relating to these 'concerns ... about the stability of the West Antarctic ice sheet':

> The problem is even worse when NGOs produce their own 'scientific evidence'. For example, in February 1997 Greenpeace researchers reported to the mass media massive cracks in Antarctic sea ice. Their report simultaneously linked this to the climate change issue, stating that the cracks were evidence of global warming. Indeed, Greenpeace had dispatched its research team to the area precisely to look for ways to highlight global warming to the public, and was able to provide dramatic video footage to a hungry media. The event might or might not be related to climate change, but the point is that this was not peer-reviewed science but a media event supporting a political campaign. (In contrast, the rebuttal of the claim by glaciologists a few days later – pointing out that warming would affect rate of melting, whereas cracking was a natural phenomenon... – received a few mundane column centimetres in the print media).[11]

Dr Kellow also criticised the Policymakers' Summary of the IPCC Second Assessment Report (1995) for ignoring

> the fact that satellite data – the only truly global measurements – which have been available since 1979, show no warming at all, but a slight cooling of 0.05°C per decade (although this is compatible with a zero trend).

The satellite data from 1979 to 2000 are reported in the 'Summary for Policymakers' of the Third Assessment Report (2001) in the following terms:

> Since the start of the satellite record in 1979, both satellite and weather balloon measurements show that the global average temperature of the lowest 8 kilometres of the atmosphere has changed by +0.05-0.10°C per decade ...

It is notable that, while Aynsley Kellow explicitly acknowledged that the observed 'slight cooling of 0.05°C per decade' up to 1995 was compatible with a zero trend, there is no comparable acknowledgement in the 2001 Summary that the observed increase of 0.05°C per decade since 1979 is also compatible with a zero trend. On the contrary, the Summary approved by governments

11 *Ibid*: 82.

last January reports the satellite and weather balloon measurements since 1979 under the sub-heading 'Temperatures have risen during the past four decades in the lowest 8 kilometres of the atmosphere'.

Under the headline 'Global warming rate rings alarm bells', *The Age* (Melbourne) of 23 January 2001 carried a report from its China correspondent on the release of the report of WG1. The 'Key findings of the global warming report' were presented in a box headed 'Climate change hots up'. The list included the WG1 findings about the decline in northern hemisphere snow cover and in Arctic sea-ice thickness, but omitted the finding that there had been no significant change in Antarctic sea-ice extent since reliable measurements began. It included the finding that the atmospheric concentration of carbon dioxide has increased by 31 per cent since 1750, but omitted the finding that the atmospheric concentration of methane had increased by 151 per cent over the same 250-year period. (According to Aynsley Kellow's paper, methane production is highly concentrated in developing countries, with rice paddies contributing 29 per cent, ruminant animals 20 per cent, fossil fuels 21 per cent, biomass burning 15 per cent and landfills 15 per cent of the total methane emissions).[12] And it included the findings that the 1990s were the warmest decade and 1998 the warmest year in the instrumental record since 1861, but omitted the fact (see previous paragraph) that satellite data, which are the only truly global measurements of average temperatures, are compatible with a zero trend since records began in 1978.

UN officials, national governments and the 'scientific consensus'

The text of *The Age* report on the WG1 conclusions gave extensive coverage to warnings by United Nations officials that governments needed to act urgently on greenhouse gas emissions. 'The scientific findings being reported today should convince governments of the need to take constructive steps towards resuming the climate change talks that stalled last November in The Hague', said Michael Zammit Cutzjar, executive secretary of the UN Climate Change Convention. And UNEP executive director Klaus Topfer said that

> The scientific consensus presented in this comprehensive report about human-induced climate change should sound alarm bells in every national capital and in every local community. We must move ahead boldly with clean energy technologies, and we should start preparing ourselves now for the rising sea levels, changing rain patterns and other impacts of global warming.

12 *Ibid*: 84.

In his NAF paper, Aynsley Kellow questioned the insistence of the IPCC on developing a 'scientific consensus', which he 'thought had not been too popular in scientific circles after Galileo'.[13] He challenged the notion that the science of IPCC was as reliable as peer-reviewed science, and argued that 'the greenhouse bandwagon is rolling along a path which is likely to lead to failure *even if the IPCC predictions prove accurate*'.[14] And he drew attention to suggestions

> that global warming might *cause* higher levels of atmospheric carbon, since there is 52 times more carbon dissolved in the oceans than present in the atmosphere, and less would remain dissolved at higher temperatures. This directionality even better accounts for evidence of association in the ice core data than the 'global warming as a result of industrial society' scenario, and some have claimed support for this from statistical analysis.[15]

Perhaps there is an answer to these suggestions somewhere in the 1000 page report from the IPCC's WG1. But there is no answer that policymakers will be able to understand in the 'Summary for Policymakers': all of the argument appears to the lay reader to *assume* that the direction of causality is from GHG concentrations to global warming rather than the other way around.

Climate change science and the international comparison project

The world's governments provide substantial funds to support climate change science: Aynsley Kellow reports an estimate that the United States alone was spending $2.1 billion annually in the mid-1990s.[16] They spend large sums supporting IPCC meetings, such as the conferences that have already taken place this year in Shanghai, Geneva and Accra (not to mention the meetings soon to be held in Nairobi and London). And they devote scarce human as well as financial resources to the negotiation of intergovernmental agreements such as the Kyoto Protocol and 'the climate change talks that stalled last November in The Hague'.

Such expenditures would be justified if they were successful in devising more effective strategies to limit GHG emissions or assisting governments to communicate to their constituencies the importance of achieving effective strategies to this end. But it is not clear that either of these objectives is being achieved.

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13 *Ibid*: 85.
14 *Ibid*: 80 (Emphasis in original).
15 *Ibid*: 83 (Emphasis in original).
16 *Ibid*: 82.

For example, in their contribution to a Special Issue of *The Energy Journal* in 1999 which incorporated a series of analyses of the economic and energy sector impacts of the Kyoto Protocol on Climate Change, economists William Nordhaus and Joseph Boyer concluded that the emissions strategy to which the Protocol seeks to give effect 'is highly cost-ineffective, with the global temperature reduction achieved at a cost almost 8 times the cost of a strategy which is cost-effective in terms of "where" and "when" efficiency'.[17] The failure of governments and intergovernmental organisations to maintain support for the United Nations/World Bank International Comparison Program (ICP) provides a sobering contrast to the generous support afforded to the science and politics of climate change. Last year's meeting of the United Nations Statistical Commission (UNSC) 'noted the support of many countries and international agencies for a viable ICP program, but in the light of the serious reservations ... regarding the quality, timeliness, credibility and transparency of the ICP as identified in the Castles and Ryten reports, recommended that the start of the next round of the global ICP be postponed by at least one year so that the following steps could be taken: (i) Securing of adequate funding for the program …' The World Bank has now reported to the March 2001 meeting of the UNSC that 'Without renewed commitment from the international community, the ICP faces a near certain death in developing countries, where a reliable information base for International Development Goals and poverty alleviation policy is badly needed'.

The entire annual cost of the ICP amounts to about $US3 million: less than the United States alone spends on climate change science each day. A rational world would recognise the need for a viable program to facilitate international comparisons of prices and of the output of nations if only for its potential contribution to the design and implementation of effective policies to meet the challenge of global climate change. But, as the World Bank's statement to the 2001 meeting of the UNSC makes clear, the output of the ICP has many uses. Among the most important is that of supporting the information needs of programs to alleviate poverty in developing countries.

Thanks to the evidence provided by the ICP, we know that average incomes in Turkmenistan are now only about one tenth of those in Japan. Far from being 'one of the wealthiest agricultural districts', the Kara-Kum desert remains a poverty-stricken area. The Turkmen canal ('the most exciting of all' of the massive Soviet construction projects,[18] according to JD Bernal in 1951) has been the cause of an environmental catastrophe since its completion in 1967. Water lost through irrigation and evaporation from the canal has contributed to a

17 Nordhaus, William and Joseph Boyer (1999). 'Requiem for Kyoto: An Economic Analysis' in *The Energy Journal, Special Issue: The Costs of the Kyoto Protocol: A Multi-Model Evaluation*: 93-130.
18 Bernal (1951), *op cit*: 11.

'disastrous decline in the Amu Darya's outflow' and this, together with 'soil and water salinization resulting from the desiccation and shrinking of the Aral Sea… threatens to ruin the Amu Darya delta as an agricultural producer…'[19]

It is not surprising that today's scientific consensus does not share Bernal's enthusiasm for 'adapting…the world to man'.

19 Encyclopedia Brittanica online: 'Turkmenistan'.