Engaging with diverse worldviews using system dynamics

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DISCUSSANT'S COMMENT

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1 | INTRODUCTION

This Comment responds to the work by Blumberga (2024) by considering further the potential that System Dynamics modelling—SD—has for dealing with stakeholders holding a range of worldviews. It does so by exploring the methodological assumptions of SD, emphasising the field's aspiration to be used in participative mode, commenting on contemporary examples of division, and reiterating the importance of supporting accommodation amongst those holding very different *Weltanschauungen*.

2 | THE BRIDGE FROM "WORLD DYNAMICS"

The central motivation of Blumberga's paper may usefully be traced back to Forrester's "World Dynamics" (1971) and the work that flowed from it. The model in Forrester's book is the founding work of global modelling (de Steiguer, 1997). Since much of the reaction to that book is entrained with reactions to the volume that rapidly followed it—"The Limits To Growth" (Meadows et al., 1972)—I will use again the convention of referring to the two together as the "Club of Rome studies," or "CoR studies" (Lane, 2019).

However, to describe the bridge from these works to Blumberga's paper, it is important to cut through the mythology that has accreted around them (*c.f.* Bardi, 2011), to be clear about what these studies actually say and what they do not say. Various points may be dispatched very quickly.

First, the CoR studies do not suggest that we are doomed (Anon., 1972b; Cole *et al.*, 1973; Maddox, 1971). They do not forecast a single, nightmarish future and assert that humanity is locked into it. Rather they explore a range of possible futures—scenarios—some of which are certainly highly undesirable. Second, they did not predict that oil would run out at 15:27 on 17th October 20XX. This absurdity is essentially a sub-case of the previous point; scenarios have little truck with point forecasts-but pretending that they do makes for good sneering copy from those who wish to be left unconstrained to pursue growth and profit, and who therefore bristle at all mention of limits (Anon., 1972a; Forrester et al., 1974). What these studies do suggest is that permanent growth involving physical resources is an implausible aspiration. The reason for this is that various balancing effects would reasonably be expected to come into play—involving crowding, pollution, resource depletion and others—causing growth to plateau or even to reverse. The central insight that emerges from this analysis is that rather than standing idly by and wishing for unrestricted growth only to experience dire consequences, we can choose which balancing effects we wish to live within.

The final insight in the CoR studies is even less well understood but for me has perhaps been its most powerful. This work uncovers an issue—the need to attend to global development—and that issue has no owner. Who, the works asks, is in charge of this stuff? No one. There is a vacuum of attention, a vacuum of agency. At least that was the way things looked in the early 1970s: "There is very little evidence that any authority exists with sufficient power to effect solutions to these problems on a worldwide basis" (Forrester, 1975, p. 233). The extent to

which the panoply of international organisations that today seek to deal with global concerns has addressed this vacuum is a matter of debate. That the CoR studies brought the issue to the fore is not.

I recall part of my reaction to reading "World Dynamics." It was the late 1980s and I had only recently discovered SD. My naïve notion was that a team of SD modellers should convene thousands of sessions in theatres and conference halls around the world. In those road-show sessions, these public forums, they would slowly build up one of the models of the causal mechanisms present in the global system and thus demonstrate the insights of the CoR studies and inspire changed behaviour.

Silly nonsense, of course. Far too rational a way of thinking. Here we see illustrated the narrow way in which the SD approach is often viewed: as a means of dealing with dynamic complexity. The world has accumulations, long chains of causality, feedback loops, delays and non-linear relationships. The result is that the consequences of our actions are hard to think through, social systems exhibit counterintuitive behaviour. There is therefore a need for SD modelling to untangle all of this so that coherent, rational policies may be formulated.

This is a powerful idea, the reach of which is still being explored. Consider, for example, the work by Moxnes (1998, 2000). He shows that the phenomenon "Tragedy of the Commons," widely diagnosed as resulting from the interactions of decisions made by many rational agents, can to a considerable extent be explained in terms of the difficulties that a single rational agent has when managing dynamic complexity.

Issues of dynamic complexity are what SD is about and it is easy to believe that they are the chief issues that confront us. I remember a convivial lunch with Jay Forrester in 2002 in which he commented, "I have never seen people really disagree about anything other than what the consequences of a policy might be." This was not Forrester at his best, I feel, since the ideas in "Industrial Dynamics" (Forrester, 1961), when properly understood, are much broader than this view (Lane, 2022). This is a point we return to in this piece. For now we can say that this narrow view of SD—that dynamic complexity is the chief issue bedevilling the world—is what the field is frequently taken to be. It can be seen in my ludicrous idea described above of a road-show of public forums in which a CoR studies model is built in front of an audience: too rational and also very domineering and very objective as a way of thinking. We now know better than this. What we know relates directly to the sort of insights that Blumberga's paper considers.

3 | THE ISSUE OF DIFFERENT WORLDVIEWS

The version of SD that is practised today retains the central idea that issues involving dynamic complexity benefit from rational analysis. However, it is more explicitly participative in its approach—both as a means of accessing the mental database and judgemental estimates, and of developing mental models so as to change subsequent behaviour. It has also become more cautious about the ontological status of the causal mechanisms it seeks to model, offering a view of the social realm that might plausibly be seen as social constructivist (Lane & Husemann, 2002, 2008). Richardson (2022) transports this view right back to 1961. He argues that for SD, as Forrester then presented it, "Systems are imaginary. We do not find them, we conjure them" (p. 413). This suggests that the position taken on models in "Industrial Dynamics" is whole-hearted "a model is merely an epistemological device." This stance would be very similar to the "Soft Systems Methodology" (SSM) approach of Checkland (1981). This view is not without merit. Nevertheless, I reluctantly remain unconvinced by Richardson on this point. SD and SSM are traditionally seen as different modelling approaches; they might well be applied to broadly related phenomena (*e.g.*, Lane, 2016), but they are distinct. Certainly they are difficult to bring together happily without quite considerable contortions of one or the other (Lane & Oliva, 1998). Consequently, I do not share Richardson's view on this aspect of "Industrial Dynamics." It is worth noting that Richardson admits that he may be over-reaching here, basing his interpretation on a single page of the work; "the evidence is scant. It is undoubtedly more honest of me to admit that I ... have slipped in a personal bias" (Richardson, 2022, pp.413–414). As an alternative, I have argued that Forrester's position is considerably less clear because there is something of a range of ideas about models in the book, these different ideas ebbing and flowing through the work (Lane, 2022). What is notable, however, is that that range does extend to an "SSM-like" view, a significant stance for an engineer writing in the late 1950s. What is certainly true is that there is the move away from a naïve realism view of models, and of the determinism that that might imply (Lane, 1999, 2000). Taken together, this all speaks of an increase in sophistication of SD practice and of its underlying ideas. But more is needed, and Blumberga's paper is one exploration of that "more."

When we pause to consider the problems of today, it is clear that there is a lot more going on than failures of rational thinking when confronted with dynamic complexity. Even if it is done in a participatory way and with underlying ideas of inter-subjectivity and social

constructivism. That "more" is the existence in the world that we all share of quite different "worldviews."

Shortly before I attended the EuSDW workshop in Stuttgart in 2023 I read a piece in a right-wing British newspaper on the climate crisis: "Europe is beginning to turn against the prophets of climate alarmism" was its headline and beneath was the typically reassuring (and subtly disparaging of anthropogenic global warming), "Levels of eco-anxiety are rising amongst the young, but the planet's future is brighter than many think" (Nelson, 2023). It was what I had come to expect of this newspaper and of this writer. What interested me was the readers' comments that this piece attracted. Below is a sample.

> [Username 1]: CO2 is not a poison it is in fact essential for all plant life on the planet and all humans produce CO2 every time we breathe out. It's [sic.] demonisation is probably the biggest con trick in human history.
>
> [Username 2]: There is no such thing as significant man made global warming. That much is clear.
>
> [Username 3]: I worry about the extra expense forced onto me by absolutely ridiculous theories dreamt up by no nothings using computer models and faux science. No actual evidence that would satisfy a scientist.
>
> [Username 4]: The climate 'emergency' is the greatest political hoax in modern history.

What we see here is not disagreement about the consequences of a policy (though there are traces of this). Rather this is versions of a viewpoint radically different from the views of The Intergovernmental Panel on Climate Change, radically different from mine and probably radically different from the views of most people reading this journal article. That said, it might still be important to be exposed to them because, to repeat the observation, we share the same world with those who hold such views. I would propose that sometimes this is the issue: how people view the world—their *Weltanschauung* or, crudely, their worldview. Now the handling of situations with divergent worldviews is a central concern of Checkland's "Soft Systems Methodology," or SSM (Checkland, 1981) and the word *Weltanschauung* was chosen carefully as a key element of the approach. "Weltanschauung" is a much broader concept than "worldview," as Checkland was careful to delineate (Checkland & Davies, 1986) but the German word can be something of a barrier and many SSM practitioners prefer the English term. Readers should feel free to follow their preference. Once one begins to use the concept of *Weltanschauung* completely new issues can be understood. We see divergence of opinion about what the big issues are. Differences regarding what values should be brought to bear. Variation not about the consequences of a policy but about what the aims of a policy ought to be.

As stated above, SSM was created to address issues of divergence, difference and variety in a manner that helped participants to reach an "accommodation" about what to do. Checkland used this word because he felt that the word "compromise" was too tainted. However, whilst addressing difference, SSM has as a core assumption that all those involved in an SSM process had enough in common with each other that they were willing to talk together to try to find an accommodation. Situations of fundamental conflict are not handled well with SSM. The striking image that Checkland used was that all of those involved had to have enough shared interests that they were willing to sit around the same campfire together and talk things through. Even if a lot of the talking involved argument.

The image is striking, the aspiration worthy, the intent of the SSM approach clear. What, however, has this to do with SD?

4 | DIFFERENT WORLDVIEWS AND SYSTEM DYNAMICS

Is dealing with different worldviews something that SD is able to handle, is even interested in trying to handle? To get some clarity it is worth exploring three versions of SD: what it is still occasionally mistaken as being; what it is widely but erroneously taken as being and what it is actually trying to be.

To take the first, in something of an "extreme-conditions test" (Forrester & Senge, 1980), we occasionally see SD likened to the fictional discipline of "Psychohistory" in the "Foundation" series of science-fiction novels by Isaac Asimov. Psychohistory is a modelling approach that is used to predict (*N.B.*) the behaviours of large groups of people. It is practiced in secret by an elite group of analysts with the aim of clandestinely controlling events. That SD is accused of making predictions has been discussed in Section 2. Regarding the "elite group" notion, a strongly supportive contemporary reviewer of "Industrial Dynamics" wondered, "whether anyone except the master and his disciples will or could ever be so successful with [SD]" (Wagner, 1963, p. 186). I have also seen the suggestion that Asimov actually based "Hari Seldon," the fictional creator of Psychohistory, on

Jay Forrester—a notion which is chronologically incoherent. The degree to which this is all a mistaken view of SD is considered in more detail elsewhere (Malczynski & Lane, 2023). Suffice it to say here that the comparison is still sometimes made and that it is annoying and very wrong. Why then is it made? In part because SD does sometimes look that way.

Which brings us to the second version of SD, erroneous again but one which is still widely held today by outsiders. Many of the early readers of "Industrial Dynamics" (Forrester, 1961) saw the modelling approach as something which, whilst not done in secret, was certainly done by very senior people (chief executives or government ministers) along with, well, perhaps not an elite, but certainly highly technically trained modellers. A casual perusal of the book, or of articles in some journals, gives the impression of a field which is highly rational and technical in nature. It may not be Psychohistory, exactly but it certainly can feel that way to a few for whom that resonance works, and to many more it still feels dour, over-mathematicised and abstruse. None of these fit Forrester's aspirations for the field.

Hence, we arrive at the third version of SD, the one that I would argue is what it is actually trying to be. As expressed in its earliest extended form (Forrester, 1961), SD was always interested in engaging with a wide range of stakeholders and in involving as many people as possible in modelling (Lane, 2022).

With that in mind we might return to the CoR studies road-show public forums idea but make some very important changes. Now, in those sessions, SD modellers would elicit from the audience its members' ideas about the causal mechanisms thought to be around in the global system, support them in playing with the model to learn about its behaviour, and in this highly participative manner help people discover for themselves the insights that their (*N.B.*) model yields.

Yet even that understates the aspiration. Forrester wanted everyone to do SD modelling and to take action in the world based on that thinking. It is central to his concept of a "New Corporate Design" (Forrester, 1965). It is seen in the story he proudly told many times about the man whose reaction to reading "World Dynamics" was to run for political office to try to effect change. It explains his taking the time to explain his thinking to an Ad Hoc Subcommittee of the (United States) House of Representatives, or at the annual meeting of the Program Board of the Division of Overseas Ministries of the National Council of Churches (Forrester, 1970, 1973). It is at the centre of his view that, "The audience must be the public in general ... [because] ... the proper role for world modelling is to build public opinion." (Forrester, 1982, p. 105 & 106). It is why he was so interested in the K-12 project and the contribution SD could make to learning (Forrester, 2007b, 2016). This is not the Jesuitical urge to reach the child of seven so as to control them for life—though it cannot dodge that interpretation completely. Ultimately, Forrester's wish was to raise wiser, more critical, more reflective citizens. Citizens who could, "transfer ... insights from one setting to another will help to break down the barriers between disciplines" (Forrester, 2007a, p. 355). Citizens who demanded more systemically coherent policies and who therefore demanded (or even became) politicians who would tackle problems with a systems approach.

System Dynamics is concerned with dynamic complexity; it always has been. It is concerned with participative modelling and in dealing with big issues; it always has been (Lane, 2010). Bring those together, however, and they imply engagement with the perspectives of different stakeholders. They imply an interest in how modelling can create agreement for action. In other words, they imply the use of SD to handle different worldviews.

5 | SYSTEM DYNAMICS AND SHARING THE CAMPFIRE

Blumberga's paper is one exploration of the "more" that SD can provide: the ability to engage with different viewpoints (Blumberga, 2024). The core idea of her paper is to use SD to explore how different *Weltanschauungen* produce different rational policy solutions. She says that she moves from an optimisation model to an SD model because:

> "The single scenario cannot satisfy the needs of all involved stakeholders, and the model should provide comprehensive insights into alternative energy futures."

She refers to:

> "public debate and learning in a democratic process where heterogeneous stakeholders jointly deal with common problems"

For me this is a notable achievement and an important indication of the contribution that SD can make.

One can imagine going further. For example, the "ideologies" covered in the paper seem to lack two worldviews that I think I detect all around me. One might be called "Small Blue," and consider people who believe in anthropogenic global warming (AGW) but who feel too insignificant (small) to do anything useful about it

themselves and are depressed (blue) by the whole thing and so are unwillingly disengaged from action. Another might be "Crushed Red," those who are too busy dealing with the stressful demands of life to be aware of AGW or to take action. Another way of going further might be to extend what the students learn from the exercise. Blumberga has tested whether students can develop sufficient empathy for other worldviews that they can choose different policy portfolios consistent with those different *Weltanschauungen*. As she reports; "role play enables participants to reflect on alternative attitudes, experiences, and worldviews." This is a good thing for her students since we know that more diverse cultural awareness can increase creativity (Saad et al., 2013). But we might then ask: what now? Could those same students, equipped with their new understanding, find a way to convene the different groups and hammer out an accommodation?

These are important questions because worldviews, belief systems, are curious and very powerful things. They provide a shared social identity (Hobolt et al., 2021). Indeed, their leaders must be "entrepreneurs of identity," constructing an idea set which offers a pathway by which people can put to one side obvious identity characteristics in favour of those promulgated by that belief system—a diagnosis offered as an explanation for female support of the not notably respectful Donald Trump (Haslam et al., 2020). Different but strongly held beliefs can consume enormous amounts of time. The utility of this is sometimes questionable. Before the Stuttgart workshop in 2023 tremendous energies (and no little vitriol) were being poured into expressing divergent views online about the merits of a supposedly then under discussion all-female re-make of the film "The Shawshank Redemption." As I complete this text in early September 2024 the wisdom and aesthetic principles of a new fad called "fridgescaping" were the subject of bewildering, voluminous and rancorous debate on social media (of course) but also on the pages of "Good Housekeeping" and "Architectural Digest" (Radin, 2024), "The Guardian" and "The New York Times" and even "New Musical Express." As you read these words some other debate will be issuing its Siren song, encouraging you to take sides and to defend your opinion to the death.

Of course, the outcome of such divergent debates may not matter. Indeed, they may seem ludicrously trivial. But they can create rancour—"how did the nation get so angry ...? " (Williams, 2024)—and create social tension. Indeed, recent years have seen the emergence of political actors who feed division—any division—as a means of gathering supporters and gaining power in the apparent belief that it is better to be in power in a country viciously divided about some things than out of power in a country with a shared general sense of how to move forwards. Moreover, when it comes to AGW and our response to it - the topic of Blumberga's paper—the issues are not trivial, they are existential. And the venue is not a country, it is the planet. Engaging with those we disagree with can be very hard work but there are bold souls who see its importance and are willing to make the attempt (Marshall, 2014, 2015). It is an important challenge to SD exactly because we are not discussing a country anymore. The campfire that people are gathered around is indeed the entire planet. We cannot leave. Whilst living with our own conscience, we have to share the world with those of different worldviews. Moving from bickering to discussion, working to reach an accommodation, helping that process of social negotiation may be most important task SD has now. Blumberga's paper indicates that we can do something here. As an occasional "Small Blue" I draw comfort from this prospect. When using SD we are encouraged to follow Forrester's advice and personal example and show courage (Forrester, 1961, Appendix O). Therefore we should rise to this challenge.

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