

The lessons of history – a mathematical social science approach and a Libyan case study

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I started off with the interchange between Sir Peter Tapsell and William Hague about Tripolitania and Cyreneica. This illustrates the point that when people discuss world events they very often seek to draw lessons from history. Certainly this was what people did when they sought to make sense of the Arab spring. At that point in my talk I offered a very simple mathematical account of the logic of applying the lessons of history, drawing on set theory – set theory is what I mean when I refer to ‘mathematics ... but not as we know it’. I also noted in passing how the mathematics of numbers and equations can be applied to the Arab Spring. Complexity theory can offer an account of the contagion of the opinion – the contagion of the opinion that you can actually go out on the streets and protest - a contagion of opinion between people within a city, between cities and between countries ... Tunisia, Egypt, Bahrain, Yemen, Syria – and of course Libya. More generally it is complexity theory, Niall Ferguson argues, that characterises the nature of history and provides a model of it.

The mathematics of complexity theory may be able to provide an account of history in general but is it able to provide an account of a specific history? In particular can mathematics provide an account of the specific complex social reality that is the current situation in Libya? Before trying to answer this question I did warn you that I am pretty ignorant about Libya and the current situation. My only information source has been The Times, and on the basis of this I offered a brief outline of the sequence of events.

In complexity theory a distinction is made between the macro dynamics and the micro dynamics and the linkage between macro events and micro events – between the system as a whole and the individuals who make up the system. Drawing on the Handbook of International Relations, I portrayed the international system as a system of actors, actions, conditions of action and criteria for action. I identified the actors involved in the Libya situation and their various conflicts of interest. I identified actors other than states and interests other than national interest. I characterised the system as having conflictual composites possessing a structure of conflicts of interest and suggested it was amenable to social choice theory and multiple criterion decision making theory.

From the system as a whole I turned to the specific decision to intervene in Libya. I contrasted the criterion of the application of principle with the criterion of utility maximisation. I noted that a reason for intervention was the desire to prevent a bloodbath and the role in the decision of Samantha Power and her book on lessons of the history of genocide. The joint statement by Cameron, Obama and Sarkozy on April 15 identified the avoidance of mass killing as the reason for intervening, continuing the intervention and removing Gaddafi. I then sought to characterise the basics of any binary choice such as whether or not to intervene. Given two options what are the reasons for and against each option? In this situation there are two types of error: doing A when B should have been chosen; and doing B when A should have been chosen. Signal detection theory, stochastic general recognition theory and complexity theory all offer insight into binary decisions such as whether or not to intervene.

So. What have I achieved? I certainly feel that I have been grappling with the specific reality of the Libyan situation. I also feel that I have been able to identify certain features of the situation which are amenable to mathematical models. I have to admit that I have not actually *done* the mathematical models. I also have to admit that my real ambition is to offer a holistic mathematical model of the Libyan situation and I feel that I am very far from that. But I do think I have made a start!